



DIGES GROUP CC

**PHASE I ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT
ASSESSMENT SPECIALIST REPORT FOR THE PROPOSED CONSTRUCTION
OF HYDRA - KRONOSS 400 kV POWER LINE AND SUBSTATION UPGRADES
WITHIN PIXLEY KA SEME DISTRICT MUNICIPALITY OF NORTHERN CAPE
PROVINCE.**

June 2023

©COPYRIGHT

This Phase 1 Archaeological and Heritage Impact Assessment Report contains intellectual information that is protected by copyright in favour of *Vhubvo Consultancy Cc*. Thus, it may not be reproduced or edited without the prior written consent of *Vhubvo Consultancy Cc*; it has been exclusively prepared for *DIGES Group CC*.



DECLARATION

ABILITY TO CONDUCT THE PROJECT

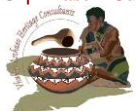
Munyadziwa Magoma is a professional archaeologist, having obtained his BA degree in Archaeology and Anthropology at University of South Africa (UNISA), an Honours degree at the University of Venda (UNIVEN), and a Master's degree at the University of Pretoria (UP). He is an accredited Cultural Resource Management (CRM) member of the Association for southern African Professional Archaeologists (ASAPA) and Amafa aKwaZulu-Natali. Munyadziwa is further affiliated to the South African Archaeological Society (SAAS), the Society of Africanist Archaeologists (SAfA), Historical Association of South Africa (HESA); Anthropology Southern Africa (ASnA); International Association for Impact Assessment (IAIAsa); International Council on Monuments and Sites (ICOMOS) and the International Council of Archaeozoology (ICAZ). He has more than fifteen years' experience in heritage management, having worked for different CRM organisations and government heritage authorities. As a CRM specialist, Munyadziwa has completed well over 2000 hundred Archaeological Impact Assessments (AIA) for developmental projects situated in several provinces of the Republic of South Africa. The AIAs projects he has been involved with are diverse, and include the establishment of major substation, upgrade and establishment of roads, establishment and extension of mines. In addition, he has also conducted Heritage Impact Assessments (HIAs) for the alteration to heritage buildings and the relocation of graves. His detailed CV is available on request.

I declare that this report has been prepared independently of any influence as may be specified by all relevant departments, institutions and organisations. I act as the independent specialists in this application and will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant. I declare that there are no circumstances that may compromise our objectivity in performing such work. I vow to comply with all relevant Acts, Regulations and applicable legislation.

AUTHOR AND CONTACT DETAILS:



Munyadziwa Magoma
 Tel: 011 312 2878
 E-mail: info@vhubvo.co.za



ACKNOWLEDGEMENTS

The author and the team of Vhubvo Consultancy Cc would like to acknowledge community members, DIGES Group CC, and Eskom officials for their assistance in relation to the conduction of this project, also Google Earth and Wikipedia.



EXECUTIVE SUMMARY

Introduction

Vhubvo Consultancy Cc has been appointed by Diges Group CC to conduct a Phase I Cultural Heritage Impact Assessment (HIA) Study for the proposed construction of ± 187 km Aries – Kronos – Hydra 400 kV power line and associated infrastructure within Pixley Ka Seme District Municipality in the Northern Cape Province. The study was conducted with the main objective of investigating the availability of archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structures of historical significance that may be affected by the proposed construction. Further, the study aims to recommend a viable option from a cultural heritage perspective and advise on mitigation measures should any sites be impacted, these mitigations will, in turn, assist the developer in making decisions on the most appropriate option (s) in line with the National Heritage Resources Act, 1999 (Act 25 of 1999).

To reach a defensible recommendation, both a desktop study and a field survey were conducted. The desktop study was undertaken through the South African Heritage Resources Information System (SAHRIS) for previous Archaeological Impact Assessments conducted in the region of the proposed development, and also for research that has been carried out in the wider area over past years. The field survey was conducted to validate any assumptions made during the desktop study.

Background and Need of the Project

Aries-Kronos-Hydra 400kV is one of the three major backbone corridors that transmit power to and from the Northern Cape Province, which has approximately 3.3 GW of committed renewable generation with over 10GW expected by 2030. However, with this current generation allocation, the existing Kronos-Hydra 400kV line will experience thermal overload, so there is need for a second Hydra-Kronos 400kV line. The work associated with the 2nd 400kV line entails:

Hydra – Kronos 2nd 400 kV line

- Construct a second ± 187 km 400 kV line from Hydra to Kronos Substation.
- Bypass series compensation on the 1st Hydra – Kronos 400 kV line.
- The power line corridor assessed is 300m wide.

Kronos Substation

- Extend 400 kV busbar at Kronos Substation.
- Establish and equip a new 400 kV feeder bay at Kronos Substation.

Hydra Substation

- Equip existing 400 kV feeder bay at Hydra Substation.



Receiving Environment

The proposed development is a linear and is located in Northern Cape Province and transverse over several local municipalities covering an area of approximately ± 187 km, from Hydra to Kronos Substations. In general, this proposal is located in the area commonly known as Namaqua District Municipality. From Eskom Hydra substation the line crossways on a pastoralist and deserted landscape until it reaches its destination at Eskom Kronos substation. In short, this power line will traverse over an arid western side of the Republic of South Africa ranging from Namaqualand outcrops, coastal flatlands and mostly on sand dunes, as well as Natural Park. Furthermore, it also transverses over general tributary features. For most part, the power line extends parallel other existing power lines.

Methodology and Approach

The study method refers to the SAHRA Policy Guidelines for impact assessment, 2012. As part of this impact assessment, the following processes were followed:

- Literature Review: To understand the background archaeology of the area, a background study was undertaken, and relevant institutions were consulted. These studies entail the view of archaeological and heritage impact assessment studies that have been conducted around the proposed area through SAHRIS. In addition, E-journal platforms such as J-stor, Google Scholars and History Resource Centre were searched. The University of Pretoria's Library collection was also utilised.
- The field survey was conducted from the 9th to the 12th of May 2023 by an archaeologist from Vhubvo. The study constituted about 187 km in length.
- The final step involved the recording and documentation of relevant archaeological resources, as well as the assessment of resources in terms of the heritage impact assessment criteria and report writing, as well as mapping and useful recommendations.

The applicable maps, tables, and figures are included as stipulated in the NHRA (Act No 25 of 1999), the National Environmental Management Act (NEMA) (Act No 107 of 1998) and the Minerals and Petroleum Resources Development Act (MPRDA) (Act No. 28 of 2002).

Research Background Studies

Archaeological Sites

Although the Namaqua area is rich of archaeological sites, it has until recent remained unknown to archaeologists in the country. The first studies of the area can be accredited to Robershaw (1977) and Webley (1984). After this research it became clear that the dry areas of the Namaqua were astonishingly archaeologically rich. The primary inhabitants of Namaqua were probably Khoi-San – the ancestors of the



present-day Nama-speakers. Hundreds of Stone Age archaeological sites have since been documented in the wider area of the Namaqua (Parkington and Hart 1991; Parkington and Poggenpoel 1990; Parkington and Hart 1993; Halkett and Hart 1997; Hart and Lanham 1997; Penn 1995; Ross 2003; Steenkamp 1975). Nonetheless, few archaeological impact assessments have yielded several stone artefacts close to the proposed area. These have been documented by amongst others Hart (2007); Kaplan (2010); Mackay *et al.* (2010); Magoma (2014); Orton (2010a, 2010b, 2011, 2012, 2013); Orton and Hart (2011); Orton *et al.* (2011). Most of these Stone Age tools are generally in poor context, and do not constitute a site. Research in the area have revealed that scattered Stone material is found in numbers, however, they remain hidden under the sand, and tend to be seen where the Aeolian sands have eroded, exposing the underlying dorbank layers (Hart 2006). Chances of finding Stone tools during construction stages in the area are thus considered a possibility.

Graves and Burials

Most of the graves in the Namaqualand have been documented in the coastline, very few have been documented inland (Dewar 2008; Jerardino *et al.* 1992; Morris 1992). Farm graveyards are known to exist in the area throughout, however, these are marginal since majority of the farms do not have graveyards, and farm owners (and workers) are buried in the nearest town graveyard (Hart 2006). Possibility of exposing graves (or its content) in this area is considered very low.

Built Environment

People were first granted farms in this area from the 19th century, as a result, historical resources predating this era are rare (Hart 2006). Farm structures with historical significance are as a result found throughout the area (Orton and Hart 2011). However, these are limited to farmhouses.

Impact Statement

The construction of the proposed powerlines may result in various threats to archaeological and grave sites in the vicinity of the new infrastructure (s), with impacts ranging from moderate to low. The impact of the proposed development on archaeological, and cultural heritage remains is rated as being medium-low. The probability of locating any important archaeological remains dating to the Stone or Iron Age during the construction of the project is always a probability. Nevertheless, no grave sites are expected, though chance finds cannot be ruled out. Possibility of exposing graves (or its content) are thus very low. Noteworthy that the linear nature of the proposed project area will cause minimal impact to the ground, i.e., tower positions can be moved to avoid direct impacts on identified heritage resources. The primary areas of concern in this study are the impacts on cultural landscape traversed by the addition of powerlines. The presence of another powerline, in addition to the existing powerlines may have a negative visual impact on heritage sites, and this impact will last for the lifespan of this development. However, this is not addressed in this report as a separate report will be dealing with visual impacts.



Restrictions and Assumptions

As with any survey, archaeological materials may be under the surface and therefore unidentifiable to the surveyor until they are exposed once construction resume. As a result, should any archaeological/ or grave site be observed during construction stage, a heritage specialist monitoring the development must immediately be notified. In the meantime, no further disturbance may be made until such time as the heritage specialist has been able to make an assessment of the find in question. It is the responsibility of the contractor to protect the site from publicity (i.e., media) until all assessments are made. It is assumed that the Social Impact Assessment and Public Participation Process might also result in the identification of sites, features and objects, including sites of intangible heritage potential in the corridors and that these then will also have to be considered. In addition, it is also assumed that a Visual Impact Assessment will be done to determine the impact of development on any identified heritage sites.

Survey Findings and Recommendations

The Archaeological and Cultural Heritage Impact Assessment for the proposed Hydra-Kronos 400kV power line and associated infrastructure has identified isolated artifacts. These tools were found in secondary positions, with no provenance and are graded as of Medium-Low value. None of these can be considered to be of such significance that can prevent the proposed development from proceeding. It must however be noted that although stone tools are almost ubiquitous in the wider region of Namaqualand, their unavailability in the proposed area is unexpected, archaeological objects are unlikely ascertainable on the surface in the Namaqua due to sand dunes. The Stone tools, chiefly associated with ancestors of the San and Khoekhoen, were only noted in areas where the Aeolian sands have eroded, exposing the underlying layers. Similarly, no Iron age site was noted in the proposed area. Iron Age people preferred to settle on the alluvial soils close to rivers. Henceforth, it doesn't appear like there was any iron age settlement in the area. In addition, archaeologists who do research in the region generally accept a site-location model proposed by Maggs (1980). The model suggests that inland sites will be found in locations that bear the following:

- Limited to below an altitude of 1000 m asl.
- Situated on the riverside or streamside locations, on deep alkaline colluvial soils; and
- In areas appropriate for dry farming (with sufficient summer rainfall).

As aforesaid, the study area was investigated for sites of heritage significance that might be affected by the proposed construction. The entire corridor was fairly investigated, and although there are no major heritage materials expected here, it is problematic to ascertain the concentration of sites that may be found given that the exact position of the powerline is yet to be finalized, archaeological sites dating to the Stone Age, known to occur in the area of the study may have been overlooked, and it is possible that specific aspects related to construction might have a direct disturbance(s), which may result in irreplaceable loss of heritage resources.



The area earmarked for the substation upgrades is within the existing yard as such this area has already been disturbed hence the possibility of finding archaeological and cultural heritage objects is low.

Taking all the above information into account, the following is recommended:

- A heritage practitioner should however complete a “walk down” of the final selected power line points, and all other activity areas (access roads, construction camps, etc.) prior to the start of any construction activities. This walk down will document all sites, features and objects, in order to propose adjustments to the pylon position and thereby to avoid as many impacts to heritage as possible.

Pre-construction education and awareness training

Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the project. The pre-construction training should include some site recognition training for the types of archaeological sites that may occur in the construction areas. Below are some indicators of an archaeological site that may be found during construction:

- Flaked stone tools, bone tools and loose pieces of flaked stone.
- Ash and charcoal.
- Bones and shell fragments.
- Artefacts (e.g., beads or hearths); and
- Packed stones which might be uncounted underground and might indicate a grave or collapse stone walling.

Conclusions

A thorough background study and survey of the proposed development was conducted, and findings were recorded in line with SAHRA guidelines. The proposed construction of a second ± 187 km Hydra-Kronos 400kV power line and associated infrastructure can proceed on condition that recommendation laid in this report will be adhered to.



TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	5
ACRONYMS AND ABBREVIATIONS.....	12
Glossary of Terms.....	13
1. Introduction	17
3. Sites Location and Description.....	18
4. Purpose of the Cultural Heritage Study	24
5. Methodology and Approach	24
6. Applicable Heritage Legislation.....	25
7. Degree of Significance	27
8. Discussion of (Pre-) History of the Study Area.....	39
9. Findings and Discussions	43
10. Recommendations.....	46
11. Conclusions.....	47
12. References.....	47
APPENDIX 1: SITE SIGNIFICANCE	50
Appendix II: Chance Find Procedure	51



List of Figures

Figure 1: Locality map of the study area.	19
Figure 2: General site overview of the area proposed for construction from Kronos substation.	21
Figure 3: View of the proposed area showing some of the existing powerline nearby.	21
Figure 4: View of some areas with dongas, these area (s) where thoroughly searched for stone tools occurrences.	22
Figure 5: View of some of the area with shrub coverage.	22
Figure 6: An overview of the area on the east of Hydra substation.	23
Figure 7: An overview of the area that forms part of the project towards Hydra substation.	23
Figure 8: View of EIA movements.	36
Figure 9: Sensitivity Map.	44
Figure 11: View of the isolated tools noted in the proposed area.	46



ACRONYMS AND ABBREVIATIONS

AIA	Archaeological Impact Assessment
EMP	Environmental Management Plan
HIA	Heritage Impact Assessment
LIA	Late Iron Age
MIA	Middle Iron Age
EIA	Early Iron Age
HMP	Heritage Management Plan
LSA	Late Stone Age
MSA	Middle Stone Age
ESA	Early Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency



Glossary of Terms

The following terms used in this Archaeology are defined in the National Heritage Resources Act [NHRA], Act Nr. 25 of 1999, South African Heritage Resources Agency [SAHRA] Policies as well as the Australia ICOMOS Charter (*Burra Charter*):

Archaeological Material: remains resulting from human activities, which are in a state of disuse and are in, or on, land and which are older than 100 years, including artifacts, human and hominid remains, and artificial features and structures.

Artefact: Any movable object that has been used modified or manufactured by humans.

Conservation: All the processes of looking after a site/heritage place or landscape including maintenance, preservation, restoration, reconstruction and adaptation.

Cultural Heritage Resources: refers to physical cultural properties such as archaeological sites, palaeontological sites, historic and prehistorical places, buildings, structures and material remains, cultural sites such as places of rituals, burial sites or graves and their associated materials, geological or natural features of cultural importance or scientific significance. These include intangible resources such as religion practices, ritual ceremonies, oral histories, memories indigenous knowledge.

Cultural landscape: “the combined works of nature and man” and demonstrate “the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both internal and external”.

Cultural Resources Management (CRM): the conservation of cultural heritage resources, management, and sustainable utilization for present and for the future generations

Cultural Significance: is the aesthetic, historical, scientific, and social value for past, present and future generations.



Chance Finds: means Archaeological artefacts, features, structures or historical cultural remains such as human burials that are found accidentally in context previously not identified during cultural heritage scoping, screening and assessment studies. Such finds are usually found during earth moving activities such as water pipeline trench excavations.

Compatible use: means a use, which respects the cultural significance of a place. Such a use involves no, or minimal, impact on cultural significance.

Conservation means all the processes of looking after a place so as to retain its cultural significance.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

Grave: A place of interment (variably referred to as burial), including the contents, headstone or other marker of such a place, and any other structure on or associated with such place.

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, plan, programme or policy which requires authorisation of permission by law, and which may significantly affect the cultural and natural heritage resources. The HIA includes recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

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

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

In situ material means material culture and surrounding deposits in their original location and context, for instance archaeological remains that have not been disturbed.



Interested and affected parties Individuals: communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by the proposal or activity and/ or who are concerned with a proposal or activity and its consequences.

Interpretation: means all the ways of presenting the cultural significance of a place.

Late Iron Age: this period is associated with the development of complex societies and state systems in southern Africa.

Material culture means buildings, structure, features, tools and other artefacts that constitute the remains from past societies.

Mitigate: The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.

Place: means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

Protected area: means those protected areas contemplated in section 9 of the NEMPAA and the core area of a biosphere reserve and shall include their buffers.

Public participation process: A process of involving the public in order to identify issues and concerns and obtain feedback on options and impacts associated with a proposed project, programme or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on or raise issues relevant to specific matters.

Setting: means the area around a place, which may include the visual catchment.

Significance: can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e., intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e., level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgments and science-based criteria (i.e., biophysical, physical cultural, social and economic).



Site: a spatial cluster of artefacts, structures, and organic and environmental remains, as residues of past human activity.



1. Introduction

DIGES Group CC contracted Vhubvo Consultancy Cc to conduct an Archaeological and Cultural Heritage Impact Assessment study for the proposed construction of a second ± 187 km 400kV power line from Hydra to Kronos substation within Pixley Ka Seme District Municipality in the Northern Cape Province. The study aims are to outline the archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structure of historical significance that may be affected by the proposed development, recommend a viable alternative corridor and advise on mitigation measures that should be implemented throughout the project's life cycle. The survey was conducted as per the SAHRA Minimum Standards for Archaeology and Palaeontology which specify the required contents of a report of this nature.

2. Nature and Need of the Proposed Project

Aries-Kronos-Hydra 400kV is one of the three major backbone corridors that transmit power to and from the Northern Cape Province, which has approximately 3.3 GW of committed renewable generation with over 10GW expected by 2030. However, with this current generation allocation, the existing Kronos-Hydra 400kV line will experience thermal overload so there is need for a second Hydra-Kronos 400kV line. The work associated with the 2nd 400kV line entails:

Hydra – Kronos 2nd 400 kV line

- Construct a second ± 187 km 400 kV line from Hydra to Kronos Substation.
- Bypass series compensation on the 1st Hydra – Kronos 400 kV line.
- The power line corridor assessed is 300m wide.

Kronos Substation

- Extend 400 kV busbar at Kronos Substation.
- Establish and equip a new 400 kV feeder bay at Kronos Substation.

Hydra Substation

- Equip existing 400 kV feeder bay at Hydra Substation.



3. Sites Location and Description

The proposed project is a linear development covering an extent of approximately 183km, from Hydra to Kronos Substations which are in the province of Northern Cape. Its transverses over three local municipalities being, Siyathemba, Kareeberg and Emthanjeni which are all within the Pixley ka Seme District Municipality. Small towns and settlement such as Coppertown, Griesenkraal, Britstown, and De Aar are within 10km radius of the powerline. In general, this proposal is located in the area commonly known as Namaqua District. From Eskom Hydra substation the line crossways on a pastoralist and deserted landscape until it reaches its destination at Eskom Kronos substation. In short, this power line will traverse over an arid western side of the Republic of South Africa ranging from Namaqualand outcrops, coastal flatlands and mostly on sand dunes, as well as Natural Park. Furthermore, it also transverses over general tributary features. For most part, the power line extends parallel other existing power lines.



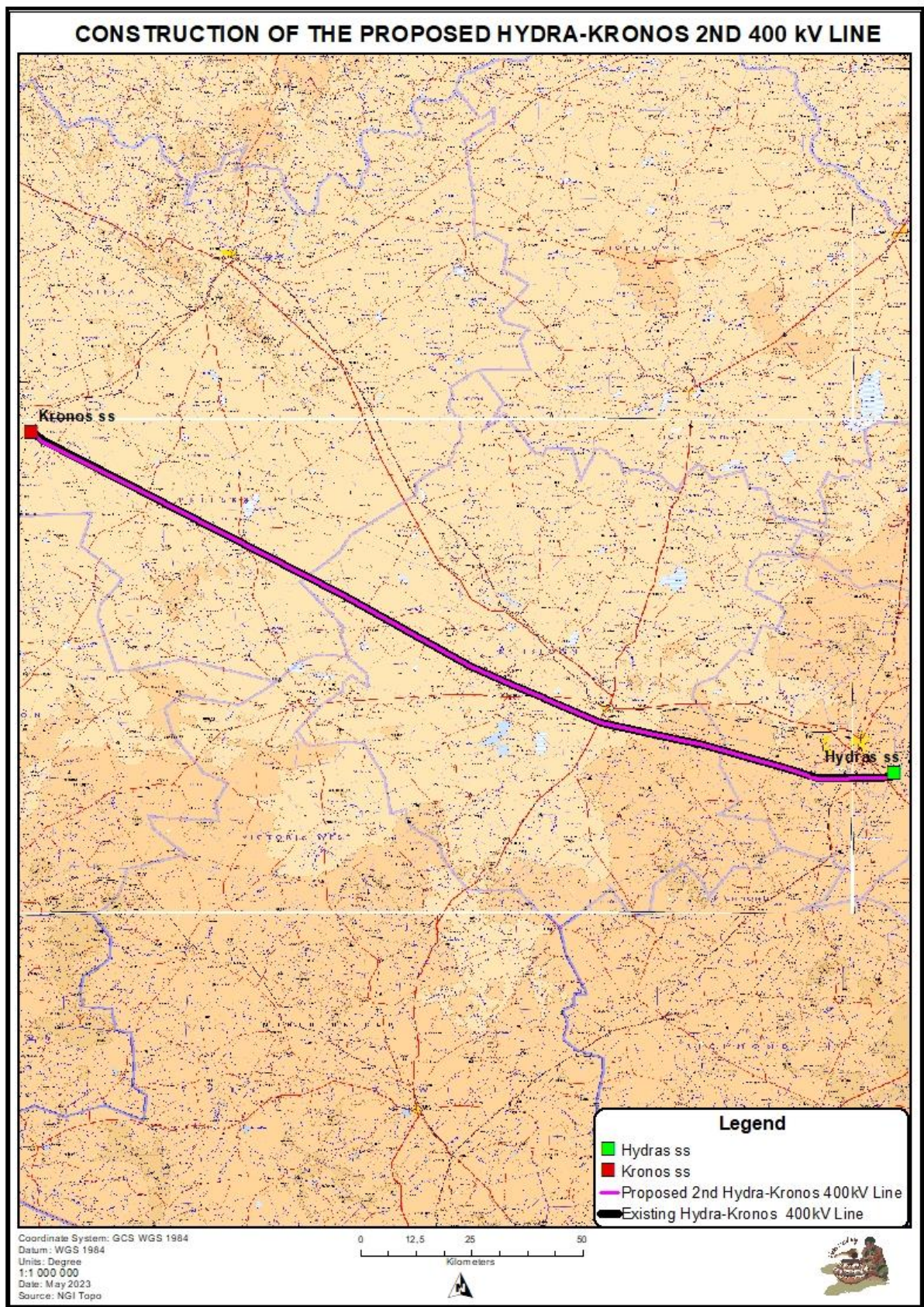


Figure 1: Locality map of the study area.



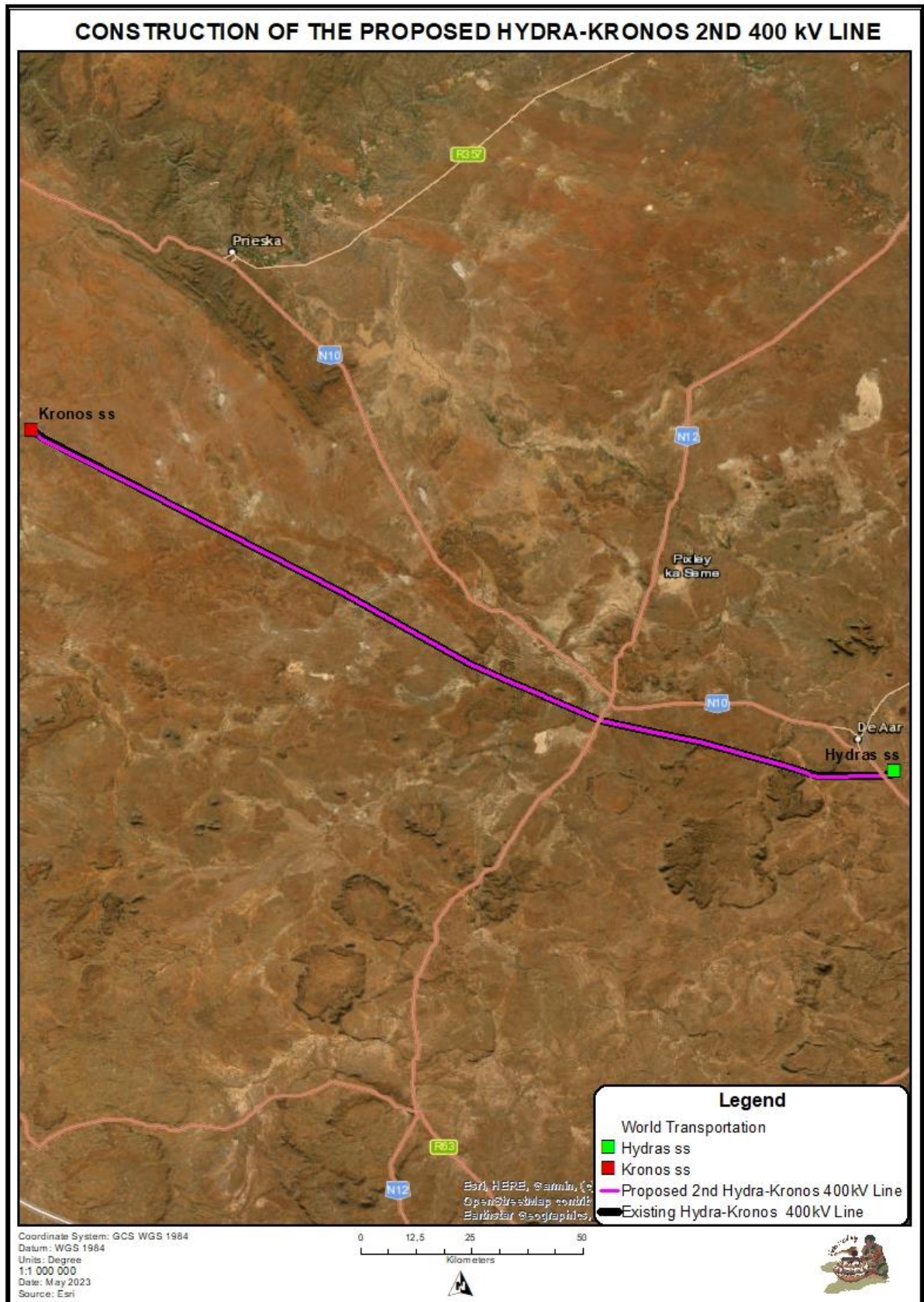


Figure 1a: An overview of the Google Earth map of the proposed project.





Figure 2: General site overview of the area proposed for construction from Kronos substation.



Figure 3: View of the proposed area showing some of the existing powerline nearby.





Figure 4: View of some areas with dongas, these area (s) where thoroughly searched for stone tools occurrences.



Figure 5: View of some of the area with shrub coverage.



Figure 6: An overview of the area on the east of Hydra substation.



Figure 7: An overview of the area that forms part of the project towards Hydra substation.



4. Purpose of the Cultural Heritage Study

The purpose of this Archaeological and Cultural Heritage study is to identify and document archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structure of historical significance that may be affected by the proposed construction of the second ± 187 km 400kV power line and these will, in turn, assist the developer in ensuring proper conservation measures in line with the National Heritage Resource Act, 1999 (Act 25 of 1999). Impact assessments highlight many issues facing sites in terms of their management, conservation, monitoring and maintenance, and the environment in and around the site. Therefore, this study involves the following:

- Identification and recording of heritage resources that may be affected by the proposed construction; and
- Providing recommendations on how best to appropriately safeguard identified heritage sites and chance findings.

5. Methodology and Approach

5.1 Background study introduction

The methodological approach is informed by the 2012 SAHRA Policy Guidelines for impact assessment. As part of this study, the following tasks were conducted:

- 1) Literature review.
- 2) Field survey; and
- 3) Report compilation taking into account the information gained during the desktop study and field survey.

5.1.1 Literature Review

The desktop study was undertaken through SAHRIS for previous Cultural Heritage Impact Assessments conducted in the region of the proposed development, and also for research that has been carried out in the area over the past years, as well as historical aerial maps located in the Deeds Office. This literature was used to screen the proposed area and to understand the baseline of heritage sensitivities.

5.1.2 Physical survey

The field survey was conducted from the 9th to the 12th of May 2023 by an archaeologist from Vhubvo.



5.1.3 Documentation

The general project area was documented by taking photographs using a 14.1 mega-pixel Sony Cybershort Digital Camera. Recording of finds was done by a Garmin etrex Venture HC.

5.2 Restrictions and Assumptions

As with any survey, archaeological materials may be under the surface and therefore unidentifiable to the surveyor until they are exposed once construction resume. As a result, should any archaeological/ or grave site be observed during construction stage, a heritage specialist monitoring the development must immediately be notified. In the meantime, no further disturbance may be made until such time as the heritage specialist has been able to make an assessment of the find in question. It is the responsibility of the contractor to protect the site from publicity (i.e., media) until all assessments are made.

It is assumed that the Social Impact Assessment and Public Participation Process might also result in the identification of sites, features and objects, including sites of intangible heritage potential in the corridors and that these then will also have to be considered. In addition, it is also assumed that a Visual Impact Assessment will be done to determine the impact of development on any identified heritage sites.

6. Applicable Heritage Legislation

Several legislations provide the legal basis for the protection and preservation of both cultural and natural resources. These include the National Environment Management Act (Act No. 107 of 1998); Mineral Amendment Act (Act No 103 of 1993); Tourism Act (Act No. 72 of 1993); Cultural Institution Act (Act No. 119 of 1998), and the National Heritage Resources Act (Act No. 25 of 1999). Section 38 (1) of the National Heritage Resources Act requires that where relevant, an Impact Assessment is undertaken in the case where a listed activity is triggered. Such activities include:

- (a) *the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length.*
- (b) *the construction of a bridge or similar structure exceeding 50 m in length; and*
- (c) *any development or other activity which will change the character of an area of land, or water -*
 - (i) *exceeding 5 000 m² in extent;*
 - (ii) *involving three or more existing erven or subdivisions thereof; or*
 - (iii) *involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) *the costs of which will exceed a sum set in terms of regulations by SAHRA or a Provincial Heritage Resources Authority.*
- (d) *the re-zoning of a site exceeding 10 000 m² in extent; or*
- (e) *any other category of development provided for in regulations by SAHRA or a Provincial Heritage Resources Authority, 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.*



Proposed Hydra-Kronos 2nd 400kV Line and Substation Upgrades

Section 3 of the National Heritage Resources Act (25 of 1999) lists a wide range of national resources protected under the act as they are deemed to be national estate. When conducting Heritage Impact Assessment (HIA) the following heritage resources have to be identified:

- (a) Places, buildings, structures and equipment of cultural significance
- (b) Places to which oral traditions are attached or which are associated with living heritage
- (c) Historical settlements and townscapes
- (d) Landscapes and natural features of formation of cultural significance
- (e) Geological sites of scientific or cultural importance
- (f) Archaeological and paleontological sites
- (g) Graves and burial grounds including-
 - (i) ancestral graves
 - (ii) royal graves and graves of traditional leaders
 - (iii) graves of victims of conflict
 - (iv) graves of individuals designated by the Minister by notice in the Gazette
 - (v) historical graves and cemeteries; and
 - (vi) other human remains which are not covered by in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983)
- (h) Sites of significance relating to the history of slavery in South Africa
 - (i) moveable objects, including -
 - (i) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites and rare geological specimens
 - (ii) objects to which oral traditions are attached or which are associated with living heritage
 - (iii) ethnographic art and objects
 - (iv) military objects
 - (v) objects of decorative or fine art
 - (vi) objects of scientific or technological interest; and
 - (vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

Other sections of the Act with a direct relevance to the AIA are the following:

Section 34(1) No person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

Section 35(4) No person may, without a permit issued by the responsible heritage resources authority :

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite.

Section 36 (3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority:

- 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 formal cemetery administered by a local authority; or
- bring onto or use at a burial ground or grave any excavation equipment, or any equipment which assists in detection or recovery of metals.



7. Degree of Significance

This category requires a broad, but detailed knowledge of the various disciplines that might be involved. Large sites, for example, may not be very important, but a small site, on the other hand, may have great significance, as it is unique to the region. The following table is used to grade heritage resources.

Table 2: Grading Systems for identified heritage resources in terms of the National Heritage Resources Act (Act 25 of 1999).

Level	Significance	Possible action
National (Grade I)	Site of National Value	Nominated to be declared by SAHRA
Provincial (Grade II)	Site of Provincial Value	Nominated to be declared by PHRA
Local Grade (IIIA)	Site of High Value Locally	Retained as heritage
Local Grade (IIIB)	Site of High Value Locally	Mitigated and part retained as heritage
General Protected Area A	Site of High to Medium	Mitigation necessary before destruction
General Protected Area B	Medium Value	Recording before destruction
General Protected Area C	Low Value	No action required before destruction

Significance rating of sites

(i) High

(ii) Medium

(iii) Low

This category relates to the actual artefact or site in terms of its actual value as it is found today, and refers more specifically to the condition that the item is in. For example, an archaeological site may be the only one of its kind in the region, thus its regional significance is high, but there is heavy erosion of the greater part of the site, therefore its significance rating would be medium to low. Generally speaking, the following are guidelines for the nature of the mitigation that must take place in Phase 2 of the project.

High

- This is a ‘do not touch’ situation, alternatives must be sought for the project, examples would be natural and cultural landscapes like the Mapungubwe Cultural Landscape World Heritage Site, or the house in which John Langalibalele resided.



Proposed Hydra-Kronos 2nd 400kV Line and Substation Upgrades

- Certain sites or features may be exceptionally important but do not warrant leaving entirely alone. In such cases, detailed mapping of the site and all its features is imperative, as is the collection of diagnostic artefactual material on the surface of the site. Extensive excavations must be done to retrieve as much information as possible before destruction. Such excavations might cover more than half the site and would be mandatory; it would also be advisable to negotiate with the client to see what mutual agreement in writing could be reached, whereby part of the site is left for future research.

Medium

- Sites of medium significance require detailed mapping of all the features and the collection of diagnostic artefactual material from the surface of the site. A series of test trenches and test pits should be excavated to retrieve basic information before destruction.

Low

- These sites require minimum or no mitigation. Minimum mitigation recommended could be a collection of all surface materials and/ or detailed site mapping and documentation. No excavations would be considered to be necessary.

In all the above scenarios, permits will be required from the South African Heritage Resources Agency (SAHRA) or the appropriate PHRA as per the legislation (the National Heritage Resources Act, no. 25 of 1999). Destruction of any heritage site may only take place when the appropriate heritage authority has issued a permit. The following table is used to determine the rating system in the receiving environment.

Table 2: Rating and evaluating criteria of impact assessment

NATURE		
Including a brief description of the impact of the heritage parameter being assessed in the context of the project. This criterion includes a brief written statement of the heritage aspect being impacted upon by a particular action or activity.		
TOPOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.



Proposed Hydra-Kronos 2nd 400kV Line and Substation Upgrades

4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on a heritage parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which heritage resources will be irreplaceably lost as a result of proposed activity		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resource	The impact will result insignificant loss of resources.



4	Complete loss of resource	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impact on the heritage parameter. Duration indicates the lifetime of a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in span shorter than the construction phase (0-1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0-2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2-10 years).
3	Long term	The impact and its effects will continue or last for entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10-50 years).
4	Permanent	The only class of the impact that will non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may		



become significant if added to other existing or potential impacts emanating from similar or diverse activities as a result of the project activity in question.

1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects.
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects
3	Medium Cumulative Impact	The impact would result in minor cumulative effects
4	High Cumulative Impact	The impact would result in significant cumulative effects.

MAGNITUDE

Describes the severity of an impact.

1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very High	Impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapsed). Rehabilitation and remediation often impossible. If possible,



Proposed Hydra-Kronos 2nd 400kV Line and Substation Upgrades

		rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
--	--	--



7. Discussion of (Pre-) History of South Africa

South Africa possesses a rich archaeological record. It has one of the longest sequences of human development in the world. South African scientists have been actively involved in the search for human origins since 1925 when Raymond Dart identified the *Taung* child as an infant halfway between apes and humans. Dart named the remains *Australopithecus Africanus*, southern ape-man, and his work fundamentally changed the focus of human evolution from Europe and Asia to Africa, and it is now widely accepted that humanity originated from Africa, hence reference to Africa as the “cradle of humanity” (Robins et al.1998). In many ways, Dart’s discovery marked the birth of paleoanthropology as a discipline. The archaeology of South Africa which fits well into the southern African periodisation is broadly divided into Stone Age, Iron Age and the Historical Period.

Stone Age

The Stone Age is the pre-historic period when humans widely used stone for tool making (Robins et al. 1998). As the early ancestors progressed physically, mentally and socially they developed stone tools. These tools are the earliest evidence of culture in southern Africa (Clark & Kuman 2000). The Stone Age began approximately 2.6 million years ago and ended around 20 000 years ago. It is divided into three phases namely the Early Stone Age, Middle Stone Age and Later Stone Age. It is argued that there are two transitional periods. Noteworthy that the time used for the Stone Age is approximate and it differs from one researcher to another (See Robins et al.1998; Korsman & Mayor 1999; Mitchell 2002).

Early Stone Age (ESA)

The Early Stone Age is dominated by two industries: the Oldowan and Acheulian. The Oldowan industry which was the earliest was developed by the earliest members of the genus *Homo*, such as *Homo habilis* around 2.6 million years ago. The Oldowan tools which are only found in Africa, and not anywhere else are mainly simple flakes which were struck from cobbles. The assemblage comprises tools such as cobble cores and pebble choppers. They were not task-specific tools, and one tool could be used for many functions (Wurz 2000). The Oldowan industry was completely replaced by the Acheulian around 1.7 million years ago. *Homo ergaster* was probably responsible for the manufacture of Acheulian tools in South Africa. Acheulian tools were longer with sharper edges which suggest they could be used for a variety of activities ranging from the butchering of animals, chopping wood, digging roots and cracking bones for marrow. The most diagnostic tools of this period are the handaxes and the cleaver. In South Africa, Oldwans tools have been found



at Sterkfontein (Brian 1985), and Kroomdrai (Clark 1993). Wonderwerk Cave (Chazan *et al.*, 2008). Sites that have yielded Acheulian tools in South Africa are Swartkraans, Kroomdri, and Sterkfontein.

Middle Stone Age (MSA)

The Middle Stone Age artefacts started appearing about 250 000 years ago and these replaced the larger handaxes and cleavers. In contrast to the ESA technique of removing flakes from a core, MSA tools were flakes to start with. There were of a predetermined size and shape and were made by preparing a core of suitable material and striking off the flake so that it was flaked according to a shape which the toolmaker desired. MSA people made a range of tools from both coarse and fine-grained rock types, sometimes rocks used for tool making were transported considerable distances, probably in bags or containers, as such tool assemblages from some MSA sites tend to lack some of the preliminary cores and contain predominantly finished products like flakes and retouched pieces. The stone toolkit of this period is dominated by elongated, parallel-sided blades as well as triangular flakes. Many MSA sites have evidence of control of fire, prior to this, rock shelters and caves would have been dangerous for human occupation due to predators (Deacon & Deacon 1999). Besides the introduction of fire, the widespread use of red ochre, probably as body paint, also shows that MSA behavior had become more human. The recent finds of decorated ochre at Blombos and decorated ostrich eggshells at Diepkloof also in the Cape further cement the point. Other sites that have yielded MSA tools in South Africa are Klassies River Mouth, Bloombos and Border Cave (Deacon & Deacon 1999).

Later Stone Age (LSA)

The Later Stone Age ranges from 20 000 to 2000 years ago. It is important to note that the transition from MSA to LSA did not occur simultaneously in southern Africa. It is described by Deacon (1984) as a period when man refined small blade tools conversely abandoning the MSA prepared-core technique. Anatomically speaking, as the brain gets bigger, tools became smaller and more efficient. Thus, refined artefacts such as thumbnails, convex-edge scrapers, crescents, and bladelets are associated with this period. Other tools of the period are hammers, adzes, bores, grooved stones, hafted tools, and points. The period also saw the introduction of poisoned arrows to enhance the effectiveness of bone points, and this led to improved hunting (Walker & Thorp 1997). Faunal evidence suggests that LSA hunter-gatherers trapped and hunted zebras, impala, warthog and bovinds of various sizes. They also diversified their protein diet by gathering tortoises, marine resources, and land snails (*Achatina*) in large quantities. In addition to bow-hunting and



marine sources collection, human behaviour was recognisably modern in many ways; uniquely traits such as rock art and purposefully burial with ornaments were common practices (Villa *et al.*2012). Rock art in form of paintings and engravings is an important signature of this period. Examples of LSA sites in South Africa are Cottage Cave and Nelson Bay Cave.

Iron Age

Iron Age is a period in human history when metal was mainly used to produce tools. The period marks the movement of farming communities into South Africa in the first millennium AD, or 2500 years ago (Mitchell 2002:259). The people were agro pastoralists that settled in the vicinity of water. In terms of material culture, pottery is a dominant and critical component of an Iron Age assemblage. Iron Age archaeologists use pottery to identify the presence and chronology of different cultural groups on sites. Through the study of stylistic traditions related to vessel shape and decoration, the movement, interaction and lineage of cultural groups can be traced (Huffman 1989). Pottery seriation in conjunction with linguistic data has been used by researchers to trace the origin of these people who brought the Iron Age culture. Researchers have traced the origin of the Bantu people with their agro pastoral to what is now the border of Nigeria and Cameroon. These people migrated eastward and southward breaking into two groups. According to Huffman (2007) there were two streams of Early Iron Age expansion in southern Africa, one referred to as the Urewe-Kwale tradition (or the eastern stream) and another one called the Kalundu tradition (or the western stream).



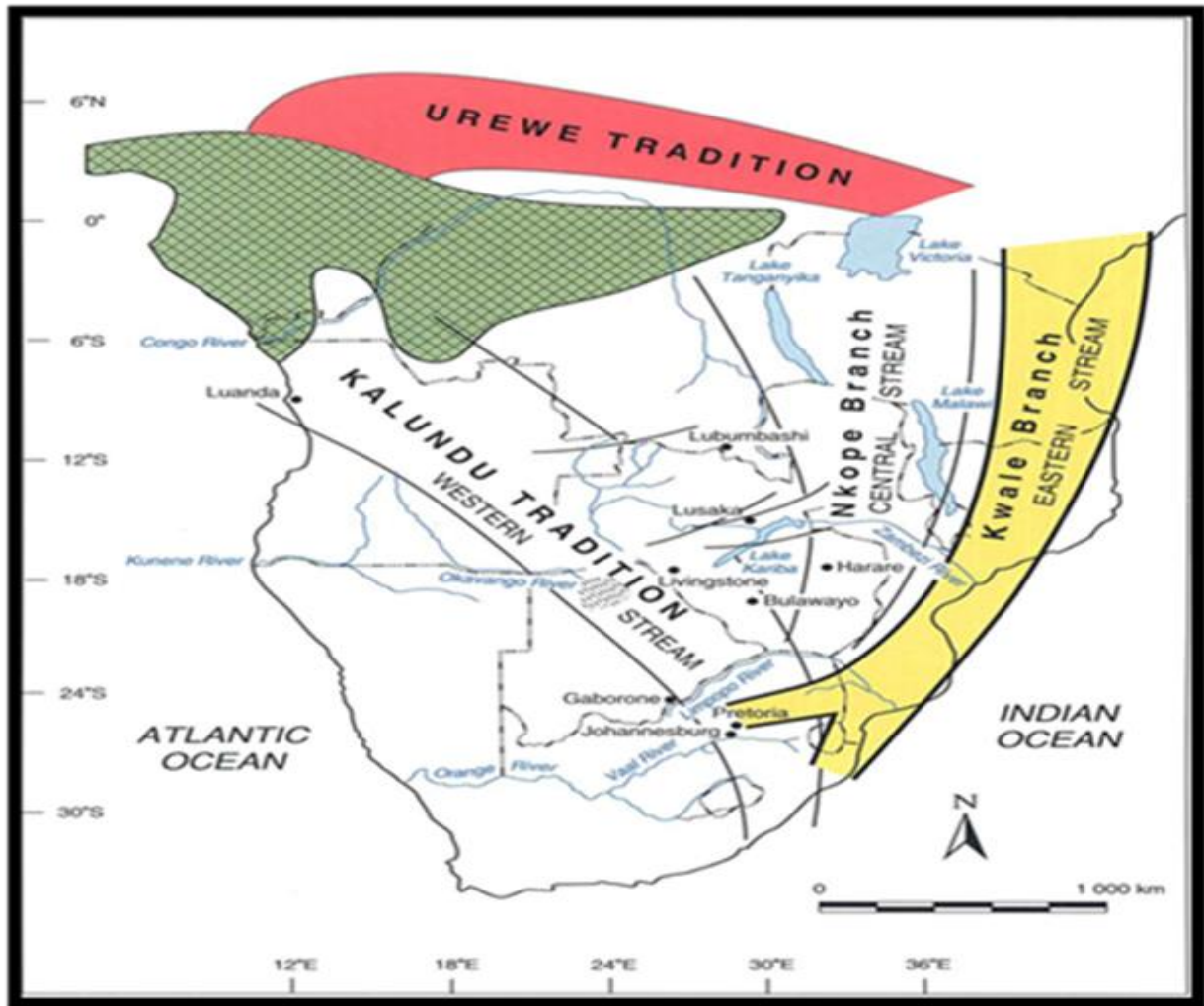


Figure 8: View of EIA movements.

Early Iron Age (EIA)

Early Iron Age dwelling were built-in low-lying areas, such as river valleys and the coastal plain, where forests and savannas facilitated shifting (slash and burn), they also cultivate grains such as cow peas, ground beans, sorghum and millets (Mitchell 2002). Early Iron Age pottery is characterized by large and prominent inverted rims, large neck areas and fine elaborate decorations. Unlike the broad and flat surface grinding stones of the Late Iron Age, the Early Iron Age grinding stones is deeper and more lenticular grooves. Well known EIA sites in South Africa include Happy Rest in the Limpopo Province, Lydenburg Heads in Mpumalanga, Broederstroom in Northwest, and Mzonjani in KwaZulu-Natal Province.

Middle Iron Age (MIA)

The Middle Iron Age stretches from AD900 to 1300 and marks the origins of Zimbabwe culture. It is marked by a change in emphasis from grain cultivation to cattle herding, however, the



importance of cattle cut across all three ages of the Iron Age period (Huffman 2007). In South Africa, a clear shift from the EIA to the MIA is apparent in the Shashe-Limpopo basin where it marks the origins of the Zimbabwe culture where it came with class distinction and sacred leadership (Huffman 2005, 2007). Middle Iron Age sites in the Shashe-Limpopo basin are Schroda, K2 and Mapungubwe.

Late Iron Age (LIA)

The Late Iron Age dates from AD1300 to 1840. Greater focus on economic growth and the increased importance of trademarks the beginning of the LIA. Specialisation in terms of natural resource exploitation and utilisation is a characteristic feature of this period. Iron slags tend to occur only in certain localities compared to earlier times. Also, Later Iron Age settlements were no longer located in river valleys but were built on higher ground where homestead which in most instances were made of stone for building purposes would benefit from cooling breezes and good views most probably for strategic purposes. Pottery styles also underwent significant changes; maize was also introduced during this period (Maggs 1980).

Historical Period

The Historical period dates from 1600. It deals with Europe's infiltration, settlement, spread and domineering of European influence in southern Africa. Its segments are Dutch settlement in the Western Cape, the troubled times of Zululand (Mfeqane/Difaqane), Voortrekkers, early missions, and the diamond rush. This period also witnessed or saw the compilation of early maps by missionaries, explorers and military personnel.

Bartolomeo Dias was the first European to sail around the southern point of Africa in 1486, he named it "The Cape of Good Hope", nine years later it was Vasco da Gama, however, these Portuguese seafarers were not seriously interested in southern Africa. Nevertheless, the history of southeast part will change forever on the 6th of April 1652. This is when the Dutch seafarer Jan van Riebeeck arrived in Table Bay with his three ships. His mission was not to establish a full-fledged colony at the Cape but to establish a supply station on behalf of the Dutch East India Company (DEIC); however, it committed itself when it granted nine company servants' freedom in 1657 to establish private farms in the Rondebosch area below the eastern slopes of Table Mountain. One of the reasons why the Dutch settled at the Cape was to access the herds of cattle kept by the Khoi-Khoi, this was first achieved by friendly trade, however it was not long before land disputes erupted after Free Burghers began to encroach on traditional communal grazing



lands. By the early 1700's the Dutch colonists have prevailed (Bergh 1999). These new white settlers will influence the context and content of South African culture forever, starting with the development of Cape Town into an urban centre, however it took many years for it to equal the size of the Mapungubwe Kingdom which was attained five centuries earlier (it is also argued that Mapungubwe was during its peak more developed than other areas in Europe). These newcomers also introduced a new style of houses consisting of flat roofs and ornate pediments, slaves were also imported from other parts of Africa, i.e., Madagascar, India, and East Asia, these slaves who were used as labourers were skilled carpenters and bricklayers as such their skills played an invaluable role in speeding up the progress and development of the Cape. It is important to note that the intermingling between the slaves, Africans, and the European population marked the beginning of the coloured community.

One of the most significant historical occurrences in the early history of South Africa was the Mfecane/Difaqane. Shaka was a shrewd king, and he established a kingdom that became the strongest throughout the region in the 19th Century. During the Mfecane/Difaqane at the end of the 19th Century, communities who had settled in the KwaZulu-Natal were displaced and forced to move out by wars between the Zulu chiefdoms (Shillington 2013). Many generals were such as Mzilikazi, Soshangane were displaced as Zululand became a desert storm. Shaka's majesty rule came to end in 1828 when he was assassinated by his half-brothers, Dingane, and Mhlangana, with Dingane assuming the leadership (Laband 1995). The kingdom became weaker and Cape merchants moved into the region to colonise Natal, and also the Voortrekker who became dissatisfied with British rule, also moved into the area (McKenna 2011).

Over a span of three years starting in 1835, some 12,000 Voortrekkers (pioneers) left the Cape Colony and trekked into the interior by ox wagon. In time, these Voortrekkers who were escaping British policies started to build a unique identity and started calling themselves Afrikaners, they also developed a hybrid language, Afrikaans, which stemmed from high Dutch but incorporated strong French, Malay, German and Black influences. The Afrikaans - speaking descendants of these people would later simply be called "Boere" (boers or farmers) (Bergh 1999). From the 1820s European missionaries worked tirelessly to christianise indigenous communities and to in-culture them in a European way of life, whatever intention these missionaries have undermine African and contributed to displacing African tradition across South Africa. By the 1860s, African states began to weaken as Europeans were eager to exploit Africans as a source of labour and to acquire the fertile area, during this era most African leaders died, e.g.: Makapane (1854); Soshangane



(1858); Sekwate (1861); Mswati (1865); Mzilikazi (1868); Moshoeshoe (1870); Mpande (1872); Sekhukhune (1882) and Makhado (1895).

With the discovery of diamonds and gold in the 19th century, urbanisation started in South Africa. People came from all over the world to claim their stake in the diamond fields, these discoveries also made the British to realise that there was great wealth for the taking outside the Cape Colony, and with these discoveries South African black's view of life were further changed. Nevertheless, the 1902 Peace treaty in Vereeniging marked the end of Anglo/Boers war, this gave South African black people peace treaty as they hope for better opportunity after all the suppression and domination by the minority, unfortunately it turned out differently as it made no provisions as far as human rights for black people were concerned, actually the process of segregation increased in South Africa.

8. Discussion of (Pre-) History of the Study Area

Native speakers of Afrikaans comprise a higher percentage of the population in the Northern Cape than in any other province in South Africa. The Northern Cape's four official languages are Afrikaans, Tswana, Xhosa, and English. Minorities speak the other official languages of South Africa, and a few people speak Khoisan languages such as Nama and Khwe.

The precolonial history of the Northern Cape is reflected in a rich, mainly Stone Age, archaeological heritage. Cave sites include Wonderwerk Cave near Kuruman, which has a uniquely long sequence stretching from the turn of the twentieth century at the surface to more than 1 million (and possibly nearly 2 million) years in its basal layer (where stone tools, occurring in very low density, Oldowan) (Chazan et al.2008). Many sites across the province occur mostly in open air locales or in sediments alongside rivers or pans, document Earlier, Middle and Later Stone Age habitation. From Later Stone Age times, mainly, there is a wealth of rock art sites – most of which are in the form of rock engravings such as at Wildebeest Kuil and many sites in the area known as !Xam -ka! kau, in the Karoo. They occur on hilltops, slopes, rock outcrops and occasionally (as in the case of Driekops Eiland near Kimberley) in riverbed. In the northeastern part of the province, there are Iron Age sites such as Dithakong. Environmental factors have meant that the spread of Iron Age farming westwards (from the 17th century – but dating from the early first millennium AD in the eastern part of South Africa) was constrained mainly to the area east of the Langeberg Mountains, but with evidence of influence as far as the Uppington area in the eighteenth century.



Proposed Hydra-Kronos 2nd 400kV Line and Substation Upgrades

From 1800 AD the archaeological record also reflects the development of a complex colonial frontier when precolonial social formations were considerably disrupted and there is an increasing 'fabric heavy' imprint of built structures, ash-heaps, and so on. The copper mines of Namaqualand and the diamond rush to the Kimberley area resulted in industrial archaeological landscapes in those areas which herald the modern era in South African history. All archaeological traces in the Northern Cape that are greater than 100 years old are automatically protected by the South African Heritage Resources Act, while some are formally protected by declaration as either Provincial Heritage Sites (e.g., Wildebeest Kuil and Nooitgedacht) or National Heritage Sites (e.g., Wonderwerk Cave).

The archaeology of Prieska just like the picture in the whole region is represented by the Stone Age archaeology, rock art localities structural remnants dating back to the Anglo-Boer War and its aftermath for example the Stone fort on top of Prieska Kopje overlooking the town. There are also graveyards and historical structures dating to more than 60 years ago. The Stone Age footprint in Prieska is represented by all the three stone age periods; the Earlier Stone Age, Middle Stone Age and the Later Stone Age, and these sites are associated with pans and alluvial contexts while the landscape in general is characterised by low density surface scatters (Beaumont et al.1995; Kibed 2006). Rock engravings have been recorded in the younger valley fills along the steep slopes located near the eastern and south-eastern margins of Asbesberge in the north of the town (Van Riet Low 1949). In addition, a number of rock art sites have been recorded on a number of farms in the study area, the farms include Kleindoring, Wonderbraai and Omdraaisvlei. As for the remnants of the Historical era, there are ruins and remnants of asbestos mining industry during the first half of the 20th century and these are located at Kliphuis and Engeldewilgeboomfontein, north of Prieska. Some LSA artefacts have been noted on farm Doornkuil, and clay pottery have been found along the Orange River and south of Douglas. No Iron Age sites are expected in the study area as it falls outside the southwestern periphery of distribution of Iron Age settlements in the region (Humphrey 1976). Before the town of Prieska was founded in 1882, early travelers frequently encountered Koranna and Bushmen groups in the region (Skead 2009). The word Prieska is derived from the Koranna word meaning 'place of the lost she-goat'. The principal Khoikhoi inhabitants of the Middle Orange River were the Einqwa who belonged to the same language group as the Namaqua and Koranna namely the Orange River Khoikhoi, and these occupied the east of Prieska (Penn 2005).



In another section of the study area, in De Aar, the archaeology is not very different from the one in Prieska. The three Stone Age periods are represented, but the Earlier and Middle Stone Age are not clearly defined. Early Stone Age tools in form Oldowan choppers with minimum retouch have been found in small assemblages in the De Aar area. LSA fragments of Ostrich eggshell have been found along Leeu River and also along the banks of Sand River. The pottery which has been found in the study has been credited to the Bushmen hunter-gatherers, instead of Khoikhoi pastoralists. In terms of the Historical era, The Anglo-Boer War history is well documented in De Aar. The British strategy to wrestle and safeguard the Cape colony against Boer invasions from the north was to keep the railway line in the running condition for up to 60 miles south of the Orange River. De Aar and other main junctions at Noupoot and Stomberg were consequently garrisoned and with De Aar being the most important of the three. From November 1900, De Aar and Orange River area became large military warehouse. The defences were further strengthened by regular scouting patrols in the vicinity. In recognition of the strong military history in the town, there is a memorial site called the Garden of Remembrance. In the garden, 182 soldiers and 7 members of the Imperial Military Railway staff. The remains of 6 soldiers previously buried at Houtkrad have also been re-buried there. Presently, the town holds a large military base.

The town of De Aar was named after the farm where it was first laid out. The farm was named by its owner, Jan Gabriel Vermeulen in 1839, on account of a vein (Dutch De Aar) or subterranean watercourse there. The town developed around the station established in 1881 and was formally laid out in 1902. It became a municipality in 1904. It is the second largest railway junction and the second largest postal centre in the Republic of South Africa. In 1914, a railway line to South-West Africa was laid out at the rate of 1,5km/day (Raper 1987).

Cultural Landscapes

Over the past twenty years a territorial approach to heritage has shifted emphasis from sites to the recognition of broad territorial attributes of heritage. Within the international discourse which has ensued, a genre of heritage called Cultural Landscapes has emerged. Article 47 of the Operational Guidelines for the Implementation of the World Heritage Convention (2005) defines Cultural Landscapes as:

Cultural landscapes are cultural properties that represent the —combined works of nature and of man" designated in Article 1 of the World Heritage Convention. They are illustrative of the evolution of human society and settlement over time, under the influence of the physical



constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal.

9. Rating based on desktop study and survey.

Section 3 of the National Heritage Resources Act (No. 25 of 1999) distinguishes nine criteria for places and objects to qualify as ‘part of the national estate if they have cultural significance or other special value ...’ These criteria are discussed below in light of the area proposed for development:

Table 3: Significant Rating.

No	Criteria	Commentary
1	Its importance in the community, or pattern of South Africa’s history	Although the area is considered sensitive, any archaeological artifacts that can be found here will be given a B rating (see Table 2) at most.
2	Its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage	Few Stone tools found in the Cape are considered high, reasons being Stone tools are numerous in the Cape, and many finds are thus common.
3	Its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage	Although most area are less disturbed, i.e., Natural Park, they do not provide potential to yield unique information.
4	Its importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects	N/A
5	Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group	N/A
6	Its importance in demonstrating a high degree of creative or technical achievement at particular period	N/A
7	Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons	N/A
8	Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and	N/A
9	Sites of significance relating to the history of slavery in South Africa.	Despite that there is information of slavery in the area dating from the early 1800, the desktop study predicted that none is expected in the area of the proposed development.



10. Findings and Discussions

The Archaeological and Cultural Heritage Impact Assessment for the proposed Hydra-Kronos 400kV power line and associated infrastructure has identified two sites with isolated artifacts (See table 3). These tools were found in secondary positions, with no provenance and are graded as of Medium-Low value. None of these can be considered to be of such significance that can prevent the proposed development from proceeding. It must however be noted that although stone tools are almost ubiquitous in the wider region of Namaqualand, their unavailability in the proposed area is unexpected, archaeological objects are unlikely ascertainable on the surface in the Namaqua due to sand dunes. The Stone tools, chiefly associated with ancestors of the San and Khoekhoen, were only noted in areas where the Aeolian sands have eroded, exposing the underlying layers. Archaeologists who do research in the region generally accept a site-location model proposed by Maggs (1980). The model suggests that inland sites will be found in locations that bear the following:

- Limited to below an altitude of 1000 m asl.
- Situated on the riverside or streamside locations, on deep alkaline colluvial soils; and
- In areas appropriate for dry farming (with sufficient summer rainfall).

It must be noted that although stone tools are almost ubiquitous in the wider region of Namaqualand, their unavailability in the proposed area is unexpected, impacts to archaeological objects are unlikely next to the shoreline due to sparse nature of human settlement away from the coast. The Stone tools, chiefly associated with ancestors of the San and Khoekhoen were only noted in area where the Aeolian sands have eroded, exposing the underlying layers. Therefore, the recommendation mentioned below should be considered with responsiveness, since they are meant to protect and conserve archaeological materials. A table detailing the findings, description, grading and recommendations is below. Figure 9 overleaf shows the location:

Table 4: Attributes of noted materials and respective significance.

Name	Co-ordinates	Significance	Mitigation
Hyk01	-30.714703 23.899187	Medium-Low	<i>C.f.</i> Excavation to inspect the subsurface occurrence.
Hyk02	-30.646732 23.649670	Medium-Low	<i>C.f.</i> Test trench to evaluate the subsurface density.



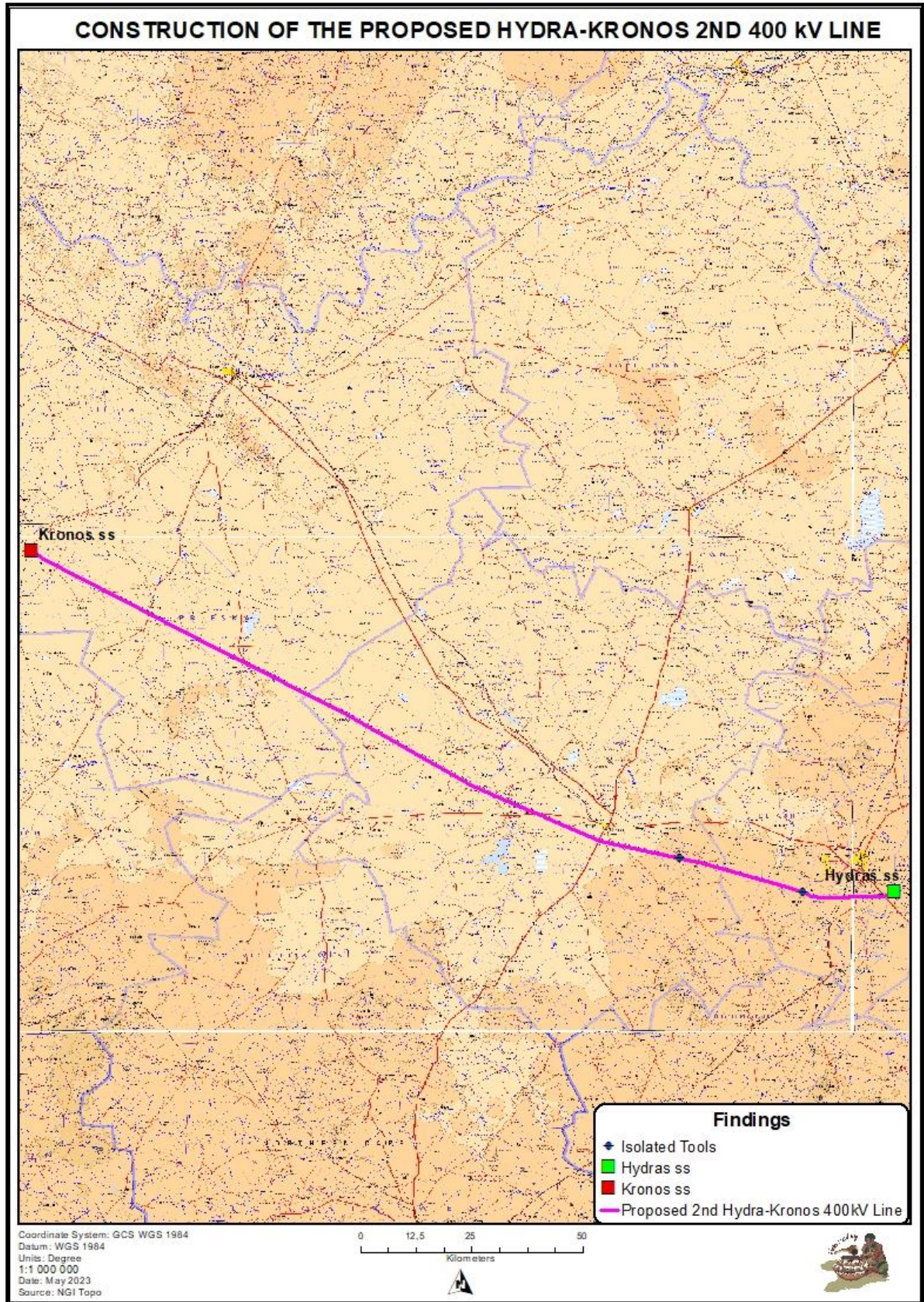


Figure 9: Sensitivity Map



9.1 Impact assessment

Below is a description of the proposed development impact ratings. These ratings are for archaeological and cultural heritage sites known to exist in the proposed area and include Stone and Iron Age, as well as Historical era materials. Note that these impacts are assessed as per Table 2 above:

Table 5: Anticipated Impact Rating.

Alternatives	Ratings
Nature	Negative
Topographical Extent	The impact will only affect the site.
Duration	Medium-term
Magnitude	Medium
Probability	Possible
Reversibility	Partly reversible
Irreplaceable Loss	The impact will result in marginal loss of resources.



Figure 10: View of the stone tools noted in the area of the proposed corridor.





Figure 10: View of the isolated tools noted in the proposed area.

11. Recommendations

As aforesaid, the study area was investigated for sites of heritage significance that might be affected by the proposed construction. The entire corridor was fairly investigated, and although there are no major heritage materials expected here, it is problematic to ascertain the concentration of sites that may be found given that the exact position of the powerline is yet to be finalized, archaeological sites dating to the Stone Age, known to occur in the area of the study may have been overlooked, and it is possible that specific aspects related to construction might have a direct disturbance(s), which may result in irreplaceable loss of heritage resources. The area earmarked for the substation upgrades is within the existing yard as such this area has already been disturbed hence the possibility of finding archaeological and cultural heritage objects is low.

Taking all the above information into account, the following is recommended:

- A heritage practitioner should however complete a “walk down” of the final selected power line points, and all other activity areas (access roads, construction camps, etc.) prior to the start of any construction activities. This walk down will document all sites, features and objects, in order to propose adjustments to the pylon position and thereby to avoid as many impacts to heritage as possible.

Pre-construction education and awareness training



Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the project. The pre-construction training should include some site recognition training for the types of archaeological sites that may occur in the construction areas. Below are some indicators of an archaeological site that may be found during construction:

- Flaked stone tools, bone tools and loose pieces of flaked stone.
- Ash and charcoal.
- Bones and shell fragments.
- Artefacts (e.g., beads or hearths); and
- Packed stones which might be uncounted underground and might indicate a grave or collapse stone walling.

12. Conclusions

A thorough background study and survey of the proposed development was conducted, and findings were recorded in line with SAHRA guidelines. As per the recommendations above, there are no major heritage reasons why the proposed development could not be allowed to proceed. Thus, it is recommended that the proposed development proceed on condition that the recommendation indicated above are adhered to.

13. References

Beaumont, P.B., Smith, A.B and Vogel, J.C. 1995. Before the Einqwa: the archaeology of the frontier zone. In: Smith, A.B (ed.) Einqualand: studies of the Orange River frontier, pp 236-264. Cape Town: University of Cape Town Press.

Bergh, J.S. (red.). 1999. Geskiedenisatlas van Suid-Afrika. Die viernoordelikeprovinsies. Pretoria: J.L. van Schaik.

Burchell, W. J. 1824. Travels in the interior of southern Africa. Volume II. Longman and Green: London.

Chazen, M. *et al.*, 2008. Radiometric Dating of the Earlier Stone Age Sequence in Excavation I at Wonderwerk Cave, South Africa: Preliminary Results. *Journal of Human Evolution*, 55(1), pp. 1-11.



Proposed Hydra-Kronos 2nd 400kV Line and Substation Upgrades

Deacon, H.J. & Deacon, J. 1999. *Human beginnings in South Africa: uncovering the secrets of the Stone Age*. Cape Town: David Philip.

Deacon, J. 1984. *Later Stone Age people and their descendants in southern Africa*. In Klein, R.G. (ed). Southern Africa prehistory and palaeoenvironments. Rotterdam: A.A. Balkema.

Denbow, J. 1983. Iron Age economies: herding, wealth and politics along the fringes of the Kalahari Desert during the Early Iron Age. Unpublished PhD dissertation.

Denbow, J. 1984. Prehistoric herders and foragers of the Kalahari: the evidence of 1500 years of interaction. In: Schrie, C (ed.). Past and Present in Hunter-gatherer studies: 175-193. Academic Press.

Goodwin, A.J.H. 1926. The Victoria West Industry. In: Goodwin, A.J.H & van Riet Lowe, C (eds). The South African Cultures of South Africa. Annals of the South African Museum.

Hall, M. 1993. The archaeology of colonial settlement in South Africa. Annual Review of Anthropology volume 22 (1993), pp 177-200.

Huffman, T.N. 2007. Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa. Scottsville: University of KwaZulu- Natal Press.

Humphreys, A.J.B. 1991. On the distribution and dating of bifacial and tanged arrowheads in the interior of South Africa. The South African Archaeological Bulletin, 46 (153): 41-43.

Korsman, S.A. & Meyer, A. 1999. Die Steentydperkenrotskuns. Bergh, J.S. (red.). Geskiedenisatlas van Suid-Afrika. Die viernoordelike provinsies. Pretoria: J.L. vanSchaik.

Kuman, K. & Field, A. S., 2009. The Oldowan Industry from Sterkfontein caves, South Africa. In: The Cutting Edge: New Approaches to the Archaeology of Human Origins. s.l.:s.n., pp. 151-169.

Kuman, K., Field, A. S. & Thackeray, J. F., 1997. Discovery of New Artefacts at Kromdraai. South African Journal of Science, 93(4), pp. 187-193.



Proposed Hydra-Kronos 2nd 400kV Line and Substation Upgrades

Lombard, M, Wadley, L, Deacon, J, Wurz, S, Parsons, I, Mohapi, M, Swart, J & Mitchell, P. 2012. South African and Lesotho Stone Age sequence updated. *South African Archaeological Bulletin* 67: 123-144.

Mitchell, P. 2002. *The Archaeology of Southern African*. Cambridge: Cambridge University Press.

Morris, A.G. 1995. The Einqua: an analysis of the Kakamas skeletons. In: Smith, A.B (ed.) *Einqualand: studies of the Orange River frontier*. pp 110-164. Cape Town: University of Cape Town Press.

National Heritage Resources Act (Act No 25 of 1999).

Penn, N. 2005. *The forgotten Frontier: Colonist and Khoisan on the Cape's Northern Frontier in the 18th Century*. Athens, Ohio and Cape Town: Ohio University Press and Double Storey Books

Raper, P.E. 1987. *Dictionary of southern African place names*. Jonathan Ball Publishers: Johannesburg.

Segoboye A. 1998. Early Farming Communities. In: Lane, P, Reid, A and Segoboye A. 1998. (ed), *Pula Press and Botswana Society*, pp 101-114.

Websites visited: 14/06/2023.

http://sagns.dac.gov.za/local_authorities.asp

<http://www.voortrekkermon.org.za/>



APPENDIX 1: SITE SIGNIFICANCE

The following guidelines for determining site *significance* were developed by SAHRA in 2003. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

(a) Historic value

- Is it important in the community, or pattern of history?
- Does it have strong or special association with the life or work of a person, group or organization of importance in history?
- Does it have significance relating to the history of slavery?

(b) Aesthetic value

- Is it important in exhibiting particular aesthetic characteristics valued by a community or cultural group?

(c) Scientific value

- Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage?
- Is it important in demonstrating a high degree of creative or technical achievement at a particular period?

(d) Social value

- Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons?

(e) Rarity

- Does it possess uncommon, rare or endangered aspects of natural or cultural heritage?

(f) Representivity

- Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects?
- What is the importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class?
- Is it important in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or



technique) in the environment of the nation, province, region or locality?

APPENDIX II: CHANCE FIND PROCEDURE

Introduction

The purpose of this document is to provide Eskom and their contractors with the appropriate response guidelines (extracted and adapted from the National Heritage Resources Act (Act No. 25 of 1999) Regulations Reg No. 6820, GN: 548, taking into consideration international best practice based on World Bank, Equator Principles and the International Finance Corporation Performance Standards, 1972 UNESCO Convention on the Protection of World Cultural and Natural Heritage (World Heritage Convention), that should be implemented in the event of chance discovery of heritage resources. These guidelines or chance find procedures (CFPs) can be incorporated into Eskom's policies that may have relevance during construction and operational phases. The CFPs aim to avoid and/or reduce project risks that may result due to chance finds, whilst considering international best practice.

Purpose of ACFP

The aim of this Archaeological Chance Find Procedure (ACFP) is to protect previously unexposed heritage resources that are yet unknown although might be encountered during the project operation or construction phase. This document serves to provide best practices to manage accidental exposed heritage resource during the development. The procedures are given to the client/applicant/contracts in order to prevent and minimize negative impact on heritage resources encountered by accident. Thus, the heritage specialist(s) compiled this chance find document with a purpose to give instructions based on relevant and appropriate actions in line with the NHRA and best guidelines to protect the chance finds on the proposed site. In significant, the ACFP stand in place to promote the preservation of heritage resources and present mitigation measure to avoid disturbance on heritage resources.

ACFP for Heritage Resources

The following procedures must be followed when heritage resources are encountered during the operational or construction phase:

- All construction/clearance activities in the vicinity of the heritage resources found by accident on site must cease immediately to avoid further damage to the chance finds.



Proposed Hydra-Kronos 2nd 400kV Line and Substation Upgrades

- Immediately report the chance finds to the supervisor/site manager or if they are unavailable, report to the project Environmental Officer (EO) who will provide further instructions.
- Record (note taking, photograph with a scale, GPS coordinates) of all the chance find exposed during the activity.
- All remains are to be stabilised in situ.
- Secure (e.g., barricade) the area to prevent further disturbance on heritage resources.
- The EO must contact the qualified archaeologist registered with the association for Association for Southern African Professional Archaeologist (ASAPA) or South African Heritage Resources Agency (SAHRA).
- The project archaeologist will conduct the inspection and assess the significance of the chance finds under SAHRA guidelines, give recommendation and mitigation measures.

