

**Basic assessment and environmental management programme:
CONSTRUCTION OF A 132KV TRANSMISSION LINE FROM THE KLIPHOEK TO
PANBULT SUBSTATION AND KLIPHOEK TO UITKOMS SUBSTATION:
MPUMALANGA PROVINCE**

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CONSTRUCTION OF A 132KV TRANSMISSION LINE FROM THE KLIPHOEK TO
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PROVINCE**

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Declaration:

I, J.A. van Schalkwyk, declare that I do not have any financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services.



J A van Schalkwyk (D Litt et Phil)
Heritage Consultant
November 2012

EXECUTIVE SUMMARY

BASIC ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PROGRAMME: CONSTRUCTION OF A 132KV TRANSMISSION LINE FROM THE KLIPHOEK TO PANBULT SUBSTATION AND KLIPHOEK TO UITKOMS SUBSTATION: MPUMALANGA PROVINCE

Due to rapid urban expansion as well as industrial development (mining), additional electricity supplies are urgently needed in the larger Ermelo region. In order to satisfy this demand, Eskom propose the construction of a 132kV power line from Uitkoms Substation, near Camden Power Station, in a south-western direction towards the Kliphoek Substation. From there the line will proceed in a more southerly direction to the Panbult Substation. For this purpose Eskom has identified routes, each with three alternative corridors to be evaluated as to its suitability for use in the construction of the power lines.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by **Royal Haskoning DHV** to conduct a Basic Assessment to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the corridors that would disqualify any such corridor from being used for the construction of the power line, or would require the implementation of mitigation measures.

The following categories of heritage sites were identified as occurring in the study area:

- Farming and farming related activities, such as farmsteads, stock pens, windmills, etc.
- Buildings and sites of heritage significance in the various towns.
- Elements of local infrastructure such as a railway line and associated stations and other structures.
- Local and private cemeteries.

Sensitive areas:

- Rock outcrops in the region show signs of having being quarried by Stone Age people in order to obtain material for producing stone tools. In addition, in some cases rock engraving occur on some of the outcrops. Therefore, all outcrops should be avoided as far as possible.
- All farmsteads, occupied or not, should be buffered with a no-go zone of at least 100 metres from the last visible feature associated with the farmstead/homestead.
- All cemeteries should have a buffer of at least 20 metres from the outer most graves. Fortunately, many cemeteries are fenced off, which can then be used as a buffer.
- All other features such as bridges, station buildings, etc. should be buffered with a no-go zone of at least 20 metres.

Evaluation:

Proposed 132kV line: Uitkoms to Kliphoek

- At present all of the Alternatives seem to be suitable for the development of this corridor.
- Proposed 132kV line: Kliphoek to Panbult
 - At present Alternative 1 seem to be the least suitable proposition for the development of this corridor.

Recommendations:

- It is recommended that the preferred Alternatives are subjected to a “walk-down” by a heritage consultant to determine if there are any fatal flaws that would prevent to proposed development from taking place.



J A van Schalkwyk
Heritage Consultant
November 2012

TECHNICAL SUMMARY

Property details	
Province	Mpumalanga Province
Magisterial district	Ermelo, Piet Retief & Wakkerstroom
Local municipality	Msukaligwa, Mkhondo
Topo-cadastral map	2630CA, 2630CB, 2630CD, 2630CC
Closest town	Ermelo, Sheepmoor
Farm name	Various

Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
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	Yes
Any other development category, public open space, squares, parks, recreation grounds	No

Development	
Description	Development of commercial facilities and a solar park
Project name	-

Land use	
Previous land use	Agriculture
Current land use	Agriculture

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Study area: Refers to the entire study area as indicated by the client in the accompanying Fig. 1 & 2.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Late Stone Age	30 000 - until c. AD 200

Iron Age: Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. As they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Late Iron Age	AD 1300 - AD 1830

Historical Period: Since the arrival of the white settlers - c. AD 1840 - in this part of the country

ABBREVIATIONS

ADRC	Archaeological Data Recording Centre
ASAPA	Association of Southern African Professional Archaeologists
BP	Before Present
CS-G	Chief Surveyor-General
EIA	Early Iron Age
ESA	Early Stone Age
LIA	Late Iron Age
LSA	Later Stone Age
HIA	Heritage Impact Assessment
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

BASIC ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PROGRAMME: CONSTRUCTION OF A 132KV TRANSMISSION LINE FROM THE KLIPHOEK TO PANBULT SUBSTATION AND UITKOMS SUBSTATION: MPUMALANGA PROVINCE

1. INTRODUCTION

Due to rapid urban expansion as well as industrial development (mining), additional electricity supplies are urgently needed in the larger Ermelo region. In order to satisfy this demand, Eskom propose the construction of a 132kV power line from Uitkoms Substation, near Camden Power Station, in a south-western direction towards the Kliphoek Substation. From there the line will proceed in a more southerly direction to the Panbult Substation. For this purpose Eskom has identified routes, each with three alternative corridors to be evaluated as to its suitability for use in the construction of the power lines.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. However, according to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by **Royal Haskoning DHV** to conduct a Basic Assessment to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the corridors that would disqualify any such corridor from being used for the construction of the power line, or would require the implementation of mitigation measures.

2. TERMS OF REFERENCE

2.1 Scope of work

The aim of this assessment, broadly speaking, is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the transmission lines and if any of these would prevent the proposed development from continuing.

The scope of work for this study consisted of:

- Conducting of a desk-top investigation of the area, in which all available literature, reports, databases and maps were studied;
- A visit to the proposed development area.

The objectives were to

- Identify possible archaeological, cultural and historic sites within the proposed development area;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

2.2 Limitations

- The routes were investigated only in a broad, overview approach as access to the different properties was not possible.
- Information such as the coordinates of the individual tower structures was not available.
- Information on aspects such as access roads, construction camps, etc. was not available.
- In some areas the vegetation, natural as well as agricultural/plantations, was very high and dense, seriously limiting archaeological visibility.

2.3 Assumptions

- 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 the selection of the preferred corridor.
- It is assumed that a Visual Impact Assessment will be done to determine the impact of the power line on any identified heritage sites.
- It is assumed that a Paleontological Review will be done by a suitably qualified specialist.

3. HERITAGE RESOURCES

3.1 The National Estate

The NHRA (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, including-
 - ancestral graves;
 - royal graves and graves of traditional leaders;
 - graves of victims of conflict;
 - graves of individuals designated by the Minister by notice in the Gazette;
 - historical graves and cemeteries; and
 - other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery in South Africa;
- movable objects, including-
 - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - objects to which oral traditions are attached or which are associated with living heritage;
 - ethnographic art and objects;
 - military objects;
 - objects of decorative or fine art;
 - objects of scientific or technological interest; and

- 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(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

3.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature’s uniqueness, condition of preservation and research potential.

According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of

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

4. STUDY APPROACH AND METHODOLOGY

4.1 Extent of the Study

This survey and impact assessment covers the area as presented in Section 5 and as illustrated in Figures 2 & 3.

4.2 Methodology

4.2.1 Preliminary investigation

4.2.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources were consulted, e.g. Berg 1998; Gaigher 2011; Roodt 2011; Van Schalkwyk 2003; Van Vollenhoven & Van den Bos 1997.

- Information of a very general nature were obtained from these sources

4.2.1.2 Data bases

The *Heritage Atlas Database*, the *Environmental Potential Atlas*, the *SAHRA Database*, the *Chief Surveyor General (CS-G)* and the *National Archives of South Africa (NASA)* were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed development.
- The original Title Deeds of some of the farms were located at the C S-G office and indicated a few features in the larger region that is of cultural historical interest.
- Some references were found in NASA, all dealing with aspects of the management of people, infrastructure and commerce in the region.

4.2.1.3 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information of a very general nature was obtained from these sources.

4.2.2 Field survey

The areas that had to be investigated were identified by **Royal Haskoning DHV** by means of maps. As the developments are linear in nature, it was surveyed by travelling the extent of the various corridors, accessing the corridors where possible, e.g. when it crosses a road.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 Site location and description

The power line will run from Uitkoms Substation, near Camden Power Station, in a south-western direction towards the Kliphoek Substation. From there the line will proceed in a more southerly direction to the Panbult Substation (Fig. 1). For more information, please see the Technical Summary presented above.

The geology of the study region is made of arenite, changing to granite in the east. The vegetation is classified as Moist Clay Highveld Grassland to North-eastern Mountain Grassland. However, over much of the study area this has been replaced due to agricultural activities and plantations.

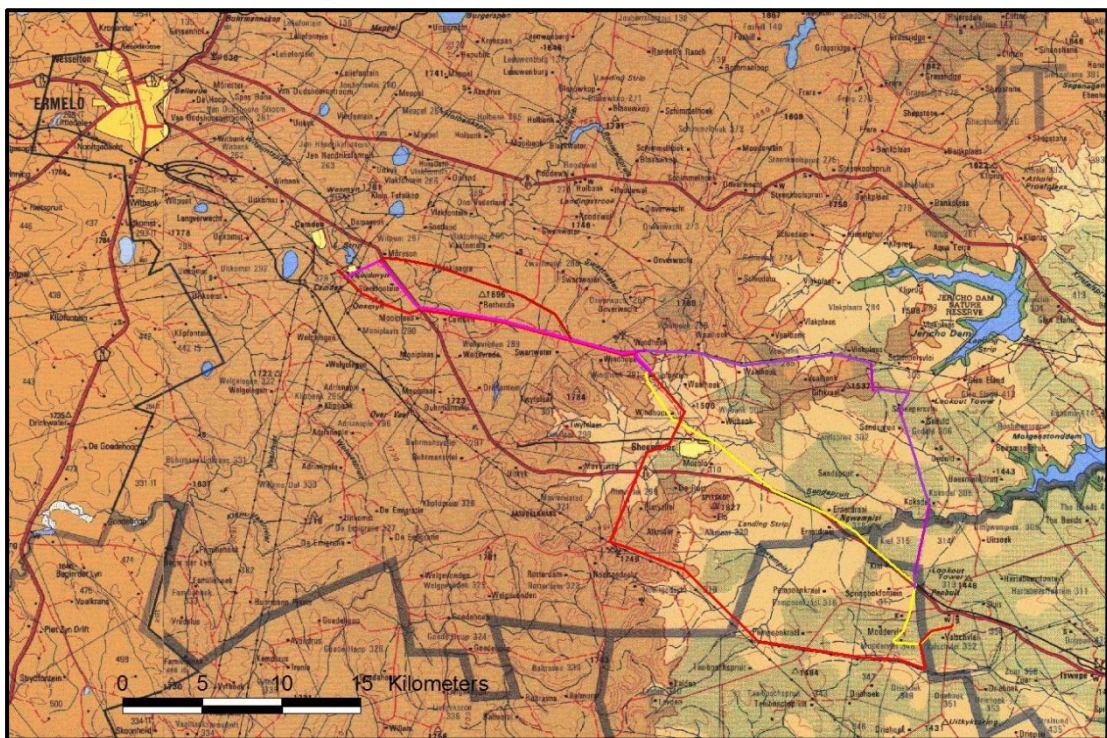


Fig. 1. Location of the study area in regional context.
(Map 2628, 2630: Chief Surveyor-General)



Fig. 2. Views over the study area, showing the different environments.

5.2 Project overview

Eskom propose the construction of a 132kV power line from Uitkoms Substation, near Camden Power Station, in a south-western direction towards the Kliphoek Substation. From there the line will proceed in a more southerly direction to the Panbult Substation. For this purpose Eskom has identified different routes, each with three alternative corridors to be evaluated as to its suitability for use in the construction of the power lines.

5.3 Overview of the region

- The aim of this section is to present an overview of the history of the larger region in order to eventually determine the significance of heritage sites identified in the study area, within the context of their historic, aesthetic, scientific and social value, rarity and representivity. For more information on how this is achieved, please see Section 3.2 as well as Appendix 1.

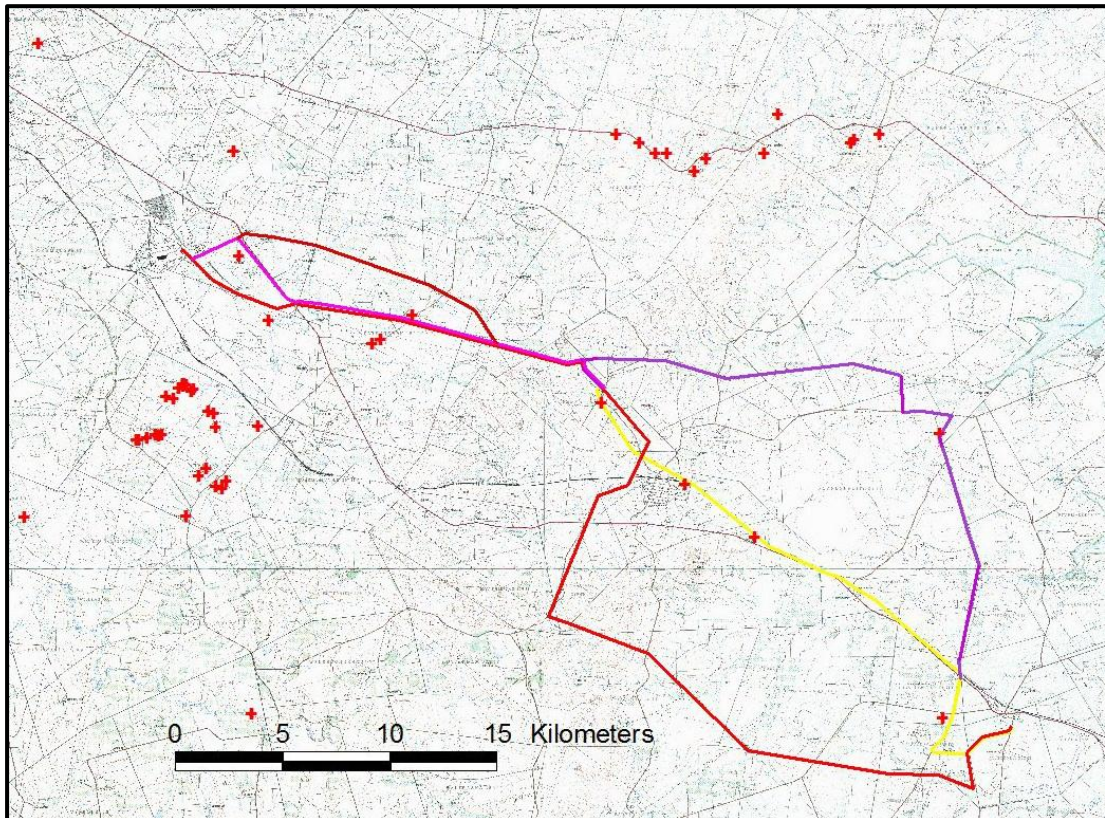


Fig. 3. Known heritage sites in the larger region.

The cultural landscape qualities of the region essentially consist of a two components. The first is a rural area in which the human occupation is made up of a pre-colonial (Stone Age and Iron Age) occupation and a much later colonial (farmer) component. The second component is an urban one consisting of a number of smaller towns, most of which developed during the last 150 years or less.

Geology

Neither Viljoen & Reimold (1999) nor Norman & Whitfield (2006) report any sites or features of geological/palaeontological significance in the region of the study area.

- As the author of this report is not a geologist, it is recommended that a suitably qualified person is contracted to produce a professional opinion on this topic.
- Geological sites

NHRA Category	Palaeontological sites
Protection status	
General Protection - Section 35: Archaeology, palaeontology and meteorites	

Early history

Very little habitation of the highveld area took place during Stone Age times. Tools dating to the Early Stone Age period are mostly found in the vicinity of larger watercourses, e.g. the Vaal River, or in sheltered areas such as the Magaliesberg. During Middle Stone Age (MSA) times (c. 150 000 – 30 000 BP), people became more mobile, occupying areas formerly avoided. The MSA is a technological stage characterized by flakes and flake-blades with faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology. Open sites were still preferred near watercourses.

Late Stone Age (LSA) people had even more advanced technology than the MSA people and therefore succeeded in occupying even more diverse habitats. Some sites are known to occur in the region. These are small rock shelters found in the sandstone cliffs near rivers and are located to the east and north of the study area. Some of these even contain rock paintings (Van Schalkwyk 2003a, 2003b). The region surrounding Chrissiesmeer, to the north of the study area, is well-known for the fact that some San people occupied it up to historic times.

The low density of occupation of the region during Stone Age times can probably be attributed to the cold winters that are common in the region, as well as the lack of suitable rock shelters that could be used for staying in.

Iron Age

Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known sites at Broederstroom south of Hartebeespoort Dam dating to AD 470. Having only had cereals (sorghum, millet) that need summer rainfall, Early Iron Age (EIA) people did not move outside this rainfall zone, and neither did they occupy the central interior highveld area. Because of their specific technology and economy, Iron Age people preferred to settle on the alluvial soils near rivers for agricultural purposes, but also for firewood and water.

The occupation of the larger geographical area (including the study area) did not start much before the 1500s. By the 16th century things changed, with the climate becoming warmer and wetter, creating condition that allowed Late Iron Age (LIA) farmers to occupy areas previously unsuitable, for example the treeless plains of the Free State and the Mpumalanga highveld.

This wet period came to a sudden end sometime between 1800 and 1820 by a major drought lasting 3 to 5 years. The drought must have caused an agricultural collapse on a large, subcontinent scale.

This was also a period of great military tension. Military pressure from Zululand spilled onto the highveld by at least 1821. Various marauding groups of displaced Sotho-Tswana moved across the plateau in the 1820s. Mzilikazi raided the plateau extensively between 1825 and 1837. The Boers trekked into this area in the 1830s. And throughout this time settled communities of Tswana people also attacked each other.

As a result of this troubled period, Sotho-Tswana people concentrated into large towns for defensive purposes. Because of the lack of trees they built their settlements in stone. These stone-walled villages were almost always located near cultivatable soil and a source of water.

Large numbers of stone-walled archaeological sites, which are dated to the Late Iron Age (c. AD 1640 - AD 1830s), are known from the larger study region. These sites are conventionally associated with Nguni-speaking people, although a second viewpoint is that it was built by Sotho-speakers. The alternative interpretation by a specific individual that these sites are of Hindu origin is discounted here.

From the air, these homesteads and towns are easily recognised and it is also possible to determine variations in smaller detail. Various researchers (Evers 1975, Marker & Evers 1976, Mason 1968 and Collet 1982) have attempted a classification of the stone walled sites on the Mpumalanga escarpment area. Of these, the work of Mason was the most extensive. However, he only focussed on homestead areas. By using site layout, he identified eight ruin classes. Collet (1982) subdivided the settlement units as:

- Simple ruins which consist of an isolated circular enclosure, and
- Complex ruins which consist of two or more contiguous circular or semi-circular enclosures.

Evers (1975) and Marker & Evers (1976) also considered other elements such as agricultural activities (terracing) and pathways (cattle track) as system of communication between settlements. According to Marker & Evers (1976:160) the combination between the three attributes forms a settlement. The current survey in the study area, have identified a fourth category of sites, namely initiation sites, which falls into a category of sites that are considered to have special meaning.

- Archaeological sites: Stone Age

NHRA Category	Archaeological and palaeontological sites
Protection status	General Protection - Section 35: Archaeology, palaeontology and meteorites

Heritage sites assessment		
<i>Site type</i>	<i>Site significance</i>	<i>Site grading (Section 7 of NHRA)</i>
Open sites; rock paintings	Paintings – high on a provincial level	II



Impact assessment	
Impact	It is highly unlikely that the power line would cross over Stone Age sites as not many of them occur in the larger region
Mitigation	If the route change and the line is to cross such a feature, total documentation

	(mapping, photographing and oral documentation) would be required
Permits	SAHRA permits

- Archaeological sites: Iron Age

NHRA Category	Archaeological and palaeontological sites
Protection status	General Protection - Section 35: Archaeology, palaeontology and meteorites

Heritage sites assessment		
<i>Site type</i>	<i>Site significance</i>	<i>Site grading (Section 7 of NHRA)</i>
Stone walled sites	High on a regional level	III



Impact assessment	
Impact	As few Iron Age sites are known to exist in the region, it is unlikely that the power line would cross over any of them
Mitigation	If the route change and the line is to cross such a feature, total documentation (mapping, photographing and oral documentation) would be required
Permits	A permit from SAHRA would be required

Historic period

White settlers moved into the area during the first half of the 19th century. They were largely self-sufficient, basing their survival on cattle/sheep farming and hunting. Few towns were established and it remained an undeveloped area until the discovered of coal and later gold. The establishment of the Nederlandsche Zuid-Afrikaansche Spoorweg-Maatskappij (NZASM) railway line in the 1880s, linking Pretoria with Lourenço Marques (Maputo) and the world at large, brought much infra-structural and administrative development to the area. This railway line also became the scene of many battles during the Anglo-Boer War.

The various battles and skirmishes resulting from the conflict during the Anglo-Boer War (1899-1902) had a huge impact on heritage resources in the area, as many farms were burned down. Conversely, it also left a legacy of heritage sites scattered across the veld: fortifications and war cemeteries occur all over. Although most of the conflict centred on the railway line to Lourenço Marques (Maputo), incidents also took place in other areas (e.g. Cloete 2000).

However, the area remained up till today, a largely farming orientated community. Much of the heritage potential of the study area is therefore located within the many farmsteads in the area. Farmhouses and related structures (e.g. barns, sheds, etc.), as well as cemeteries dot

the landscape. Equally important, are the homesteads, related structures and cemeteries of the farm labourers living on these farms.

The town of Ermelo was established in 1879 on the farm Nooitgedacht. This was the result of the fact that the region has become a big stopover for people travelling between the coast and the gold fields in on the Witwatersrand. Later it was decided to establish a church in the region, which quickly led to the development of the town. The area also became known for the agricultural research station, named Nooitgedacht, where, for example, the Nooitgedachter horse bread was bred for the first time.

- Farmsteads

Farmsteads are complex features in the landscape, being made up of different yet interconnected elements. Typically these consist of a main house, gardens, outbuildings, sheds and barns, with some distance from that labourer housing and various cemeteries. In addition roads and tracks, stock pens and wind mills complete the setup. An impact on one element therefore impacts on the whole.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
General Protection - Section 34: Structures older than 60 years	

Heritage sites assessment		
<i>Site type</i>	<i>Site significance</i>	<i>Site grading (Section 7 of NHRA)</i>
Farmsteads	Medium on a regional level	III



Impact assessment	
Impact	It is unlikely that the power line would cross over any existing farmstead or other buildings
Mitigation	If the route change and the line is to cross such a feature, total documentation (mapping, photographing and oral documentation) would be required
Permits	If older than 60 years, a permit from SAHRA would be required

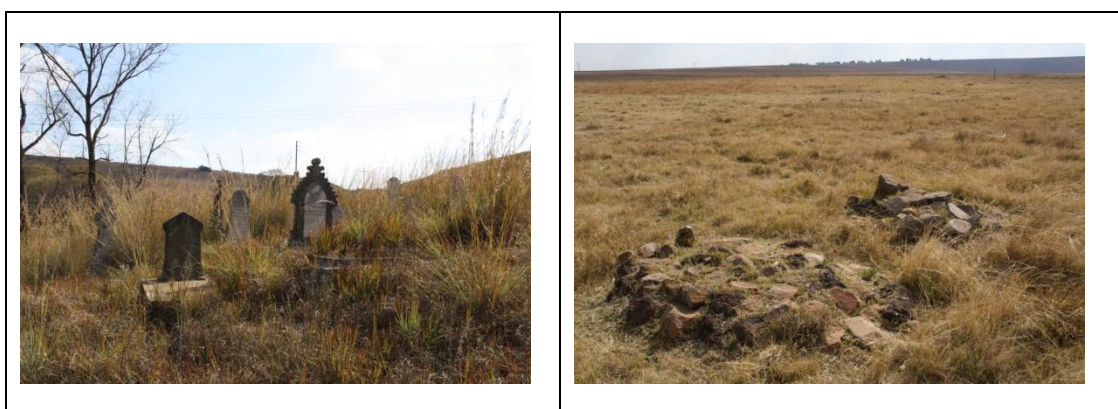
- Cemeteries

Apart from the formal cemeteries that occur in municipal areas (towns or villages), a number of these, some quite informal, i.e. without fencing, is expected to occur sporadically all over, but probably in the vicinity of the various farmsteads. Many might also have been forgotten, making it very difficult to trace the descendants in a case where the graves are to be relocated.

Most of these cemeteries, irrespective of the fact that they are for land owner or farm labourers (with a few exceptions where they were integrated), are family orientated. They are therefore serve as important 'documents' linking people directly by name to the land.

NHRA Category	Graves, cemeteries and burial grounds
Protection status	
General Protection - Section 36: Graves or burial grounds	

Heritage sites assessment		
<i>Site type</i>	<i>Site significance</i>	<i>Site grading (Section 7 of NHRA)</i>
Cemetery	High on a regional level	III



Impact assessment	
Impact	As it is unlikely that the power line would have any other than a visual impact on such sites, it is recommended that they are retained in their current location.
Mitigation	These sites should be avoided at all times. During construction it should be clearly demarcated, e.g. by using danger tape.
Permits	If retained, no permits are necessary

- Infrastructure and industrial heritage

In many cases this aspect of heritage is left out of surveys, largely due to the fact that it is taken for granted. However, the land and its resources could not be accessed and exploited without the development of features such as roads, bridges, railway lines, electricity lines and telephone lines.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
General Protection - Section 34: Structures older than 60 years	

Significance	Medium on a regional level – Grade III
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Impact assessment	
Impact	As it is unlikely that the power line would have any other than a visual impact on such sites, it is recommended that they are retained in their current location.
Mitigation	These sites should be avoided at all times. During construction it should be clearly demarcated, e.g. by using danger tape.
Permits	If retained, no permits are necessary

- Towns

Ermelo:

The town of Ermelo was established in 1879 on the farm Nooitgedacht. This was the result of the fact that the region has become a big stopover for people travelling between the coast and the gold fields on the Witwatersrand. Later it was decided to establish a church in the region, which quickly led to the development of the town. The area also became known for the agricultural research station, named Nooitgedacht, where, for example, the Nooitgedachter horse bread was bred for the first time.

- According to available data bases this town has 5 buildings listed as of provincial significance. In addition some cemeteries and monuments also occur.
- As the proposed power line does not cross into town, there would be no impact on any of these sites.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
General Protection - Section 34: Structures older than 60 years	



Impact assessment	
Impact	As it is unlikely that the power line would have any impact on such sites.
Mitigation	These sites should be avoided at all times. During construction it should be clearly demarcated, e.g. by using danger tape.
Permits	If retained, no permits are necessary

5.4 Route description

The project consists of two different but interlinked components which are discussed separately below:

5.4.1 Proposed 132kV line: Kliphoek to Uitkoms

- Three corridor alternatives have been identified.

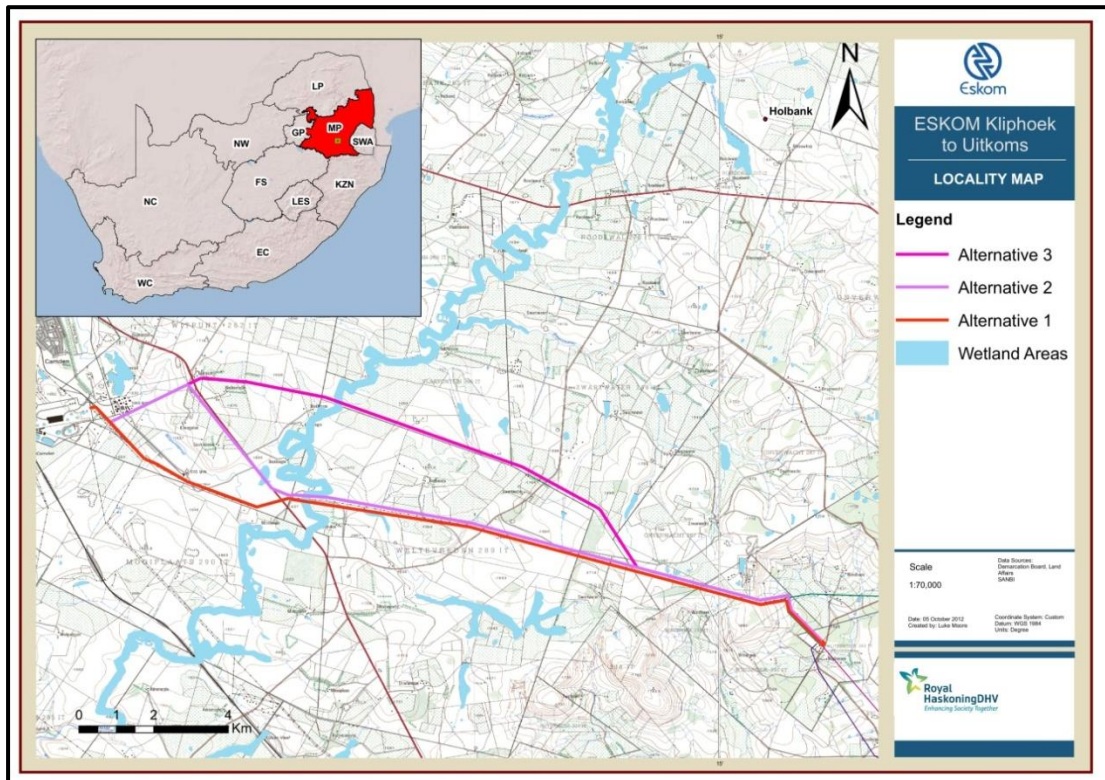


Fig. 4. Map showing the alternative corridors for the power line.

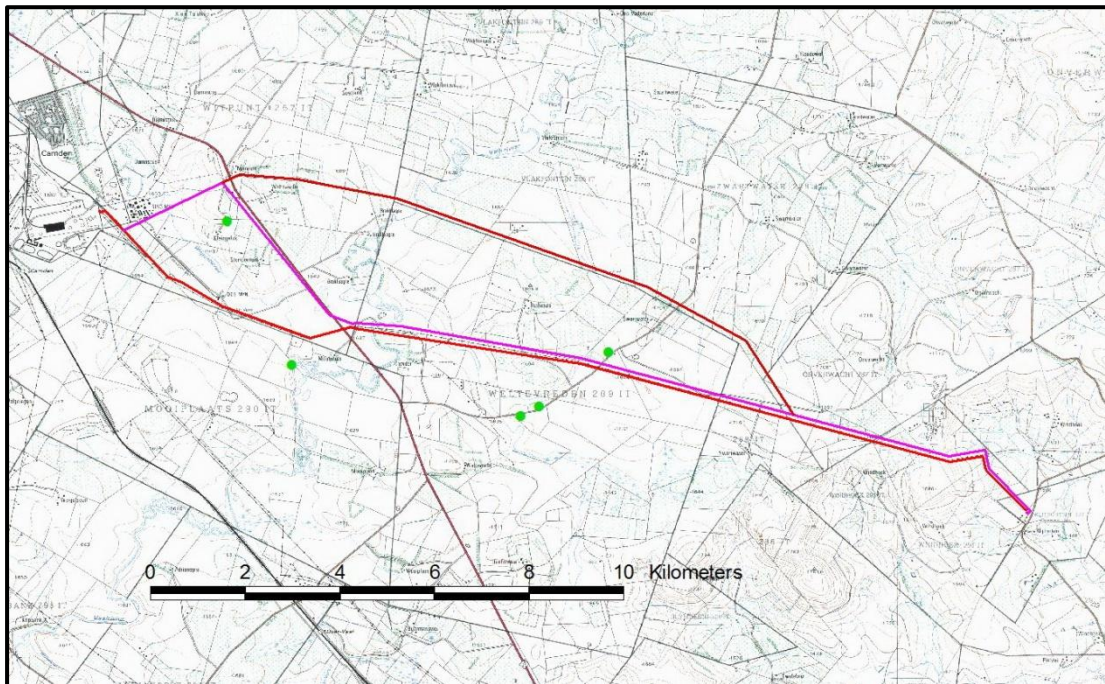


Fig. 5. Location of known heritage sites in relation to the corridors.

The following sites, features and objects of cultural significance are known to exist in the identified corridors:

- Some farmsteads and other farming related features occur in the vicinity of Alternative 3.



- A number of formal and informal cemeteries occur in the immediate vicinity of the Alternative 1.



Impact assessment:

- Based on current information it is our view that for most of the corridor alternatives there would be no problem from a heritage point of view for the development of the power line.
 - At present all three Alternatives seem to be suitable for the development of this corridor.

5.4.2 Proposed 132kV line: Kliphoek to Panbult

- Three corridor alternatives have been identified.

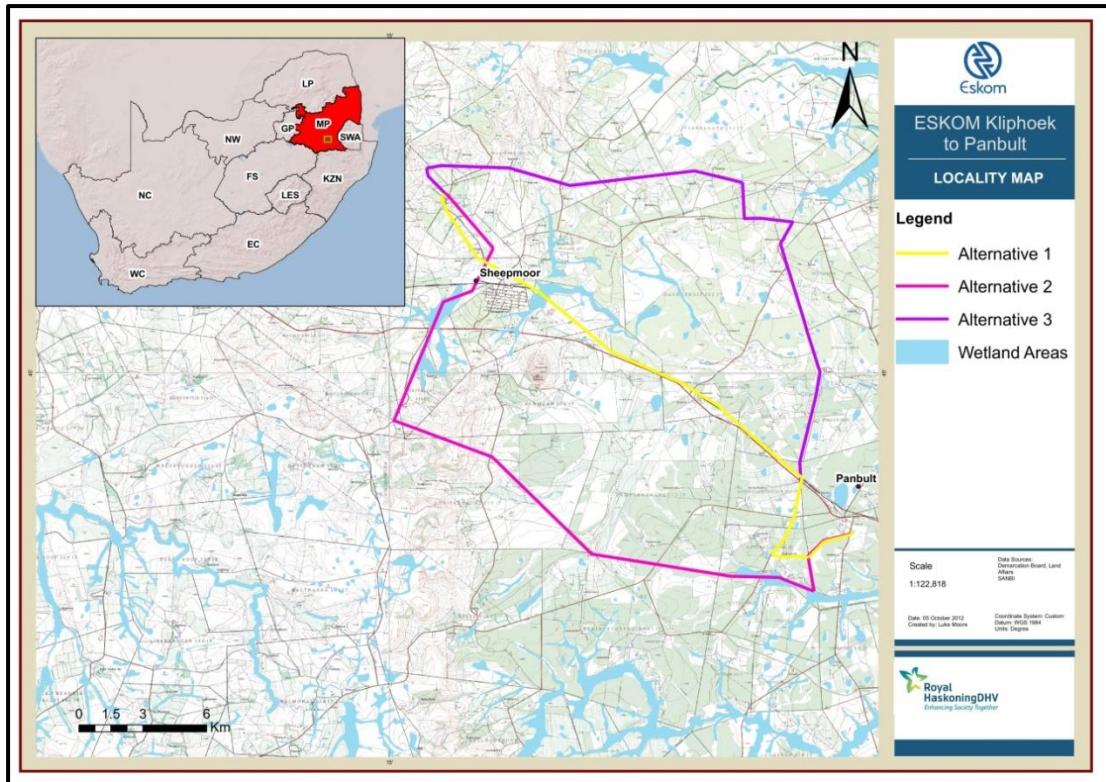


Fig. 6. Map showing the alternative corridors for the power line.

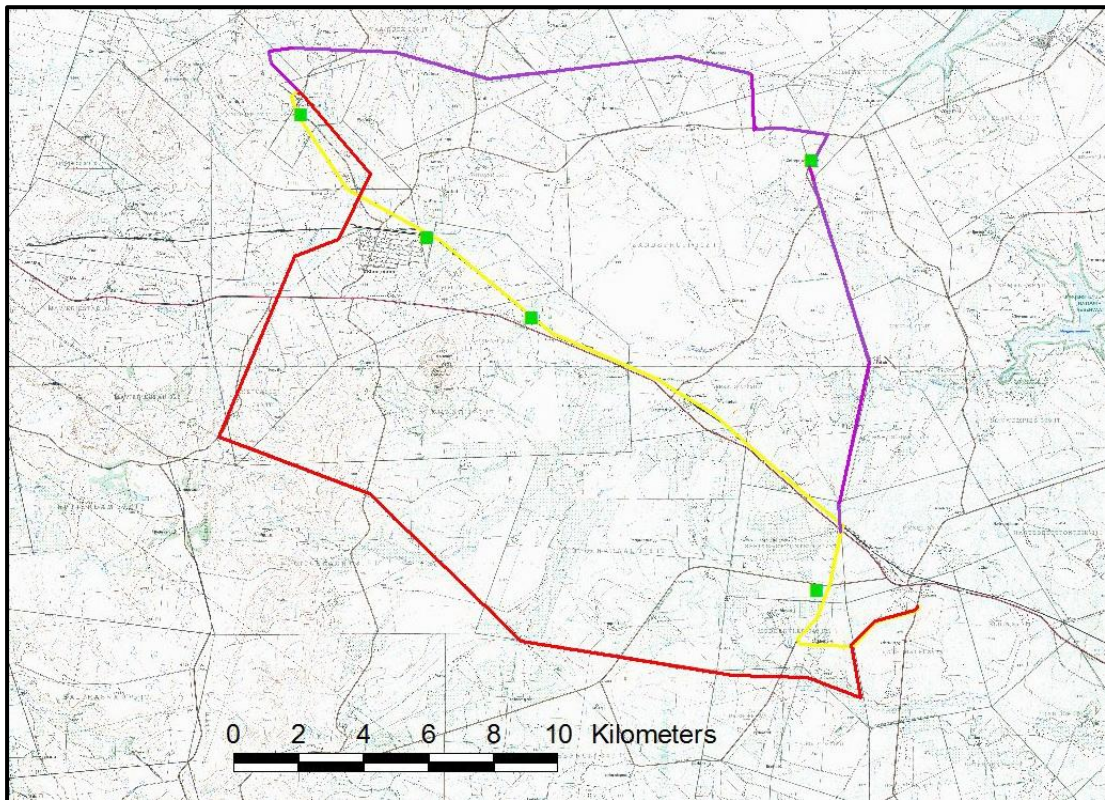


Fig. 7. Location of known heritage sites in relation to the corridors.

The following sites, features and objects of cultural significance are known to exist in the identified corridors:

- Some farmsteads and other farming related features occur in the vicinity of Alternative 3.



- A number of formal and informal cemeteries occur in the immediate vicinity of the Alternative 1.



- Some features that can be classified as infrastructural/industrial heritage occur in close proximity of Alternative 1.



Impact assessment:

- Based on current information it is our view that for most of the corridor alternatives there would be no problem from a heritage point of view for the development of the power line.
 - At present Alternatives 2 and three seems to be the most suitable for the development of this corridor.

6. COMPARATIVE ASSESSMENT OF ALTERNATIVES

Key

Preferred	The alternative will result in a low impact / reduce the impact
Not Preferred	The alternative will result in a high impact / increase the impact
Favourable	The impact will be relatively insignificant

Alternative	Preference	Reasons
UITKOMS-KLIPHOEK POWER LINE		
Corridor Route 1 (red)	Favourable	
Corridor Route 2 (pink)	Favourable	
Corridor Route 3 (purple)	Favourable	
KLIPHOEK-PANBULT POWER LINE		
Corridor Route 1 (yellow)	Not preferred	Large number of heritage features
Corridor Route 2 (purple)	Favourable	
Corridor Route 3 (green)	Favourable	

7. SITE SIGNIFICANCE AND ASSESSMENT

7.1 Heritage assessment criteria and grading

According to the NHRA, No. 25 of 1999, Section 2(vi), the *significance* of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential.

A matrix was developed whereby the above criteria, as set out in Sections 3(3) and 7 of the NHRA, No. 25 of 1999, were applied for each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites.

The NHRA stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I:** Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II:** Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III:** Other heritage resources worthy of conservation, on a local authority level.

The occurrence of sites with Grade I significance will demand that the development activities be drastically altered in order to retain these sites in their original state. For Grade II and Grade III sites, the application of mitigation measures would allow the development activities to continue.

7.2 Statement of significance

In terms of Section 7 of the NHRA, all the sites currently known or which are expected to occur in the study area are evaluated to have Grade III significance with

- Farming and farming related activities, such as farmsteads, stock pens, windmills, etc. would have a high significance on a local level.
- Town/community cemeteries and farm cemeteries would have a high significance on a local level.

7.3 Impact assessment

Impact analysis of cultural heritage resources under threat of the proposed development, are based on the present understanding of the development.

Environmental Parameter	Stone Age	
Issue/Impact/Environmental Effect/Nature	Many sites are still unknown. Their potential and significance therefore unknown. The impact will be the physical disturbance of the material and its context. Impact will be focused on a particular node, i.e. if the trench cut through a site.	
<i>Extent</i>	Local	
<i>Probability</i>	Possible	
<i>Reversibility</i>	Partly reversible	
<i>Irreplaceable loss of resources</i>	Marginal loss	
<i>Duration</i>	Medium term	
<i>Cumulative effect</i>	Low cumulative effect	
<i>Intensity/magnitude</i>	Medium	
<i>Significance Rating</i>	Sites have a medium significance on a region level – viewed as NHRA Grade III sites.	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	1
Probability	2	1
Reversibility	3	1
Irreplaceable loss	4	1
Duration	4	1
Cumulative effect	2	1
Intensity/magnitude	2	1
Significance rating	34 (Negative low impact)	6 (low negative)
Mitigation measures	All of these sites should be avoided as far as possible. Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. Sites that cannot be avoided should be excavated in full by an archaeologist qualified in Stone Age archaeology.	

Environmental Parameter	Iron Age
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Issue/Impact/Environmental Effect/Nature	Many sites are still unknown. Their potential and significance therefore unknown. The impact will be the physical disturbance of the material and its context. Impact will be focused on a particular node, i.e. if the trench cut through a site.	
<i>Extent</i>	Local	
<i>Probability</i>	Possible	
<i>Reversibility</i>	Partly reversible	
<i>Irreplaceable loss of resources</i>	Marginal loss	
<i>Duration</i>	Medium term	
<i>Cumulative effect</i>	Low cumulative effect	
<i>Intensity/magnitude</i>	Medium	
<i>Significance Rating</i>	Sites have a medium significance on a region level – viewed as NHRA Grade III sites.	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	1
Probability	2	1
Reversibility	3	1
Irreplaceable loss	4	1
Duration	4	1
Cumulative effect	2	1
Intensity/magnitude	2	1
Significance rating	34 (Negative low impact)	6 (low negative)
Mitigation measures	All of these sites should be avoided as far as possible. Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. Sites that cannot be avoided should be excavated in full by an archaeologist qualified in Iron Age archaeology.	

Environmental Parameter	Colonial Period – farmsteads	
Issue/Impact/Environmental Effect/Nature	The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole	
<i>Extent</i>	Local	
<i>Probability</i>	Possible	
<i>Reversibility</i>	Partly reversible	
<i>Irreplaceable loss of resources</i>	Marginal loss	
<i>Duration</i>	Medium term	
<i>Cumulative effect</i>	Low cumulative effect	
<i>Intensity/magnitude</i>	Medium	
<i>Significance Rating</i>	Sites have a medium significance on a region level – viewed as NHRA Grade III sites.	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	1

Probability	2	1
Reversibility	2	1
Irreplaceable loss	2	1
Duration	2	1
Cumulative effect	2	1
Intensity/magnitude	2	1
Significance rating	24 (Negative low impact)	6 (low negative)
Mitigation measures	All of these sites should be avoided as far as possible. Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures have been followed.	

Environmental Parameter	Colonial Period – cemeteries	
Issue/Impact/Environmental Effect/Nature	The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole	
<i>Extent</i>	Local	
<i>Probability</i>	Possible	
<i>Reversibility</i>	Partly reversible	
<i>Irreplaceable loss of resources</i>	Marginal loss	
<i>Duration</i>	Medium term	
<i>Cumulative effect</i>	Low cumulative effect	
<i>Intensity/magnitude</i>	Medium	
<i>Significance Rating</i>	Sites have a medium significance on a region level – viewed as NHRA Grade III sites.	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	1
Probability	2	1
Reversibility	2	1
Irreplaceable loss	2	1
Duration	2	1
Cumulative effect	2	1
Intensity/magnitude	2	1
Significance rating	24 (Negative low impact)	6 (low negative)
Mitigation measures	All of these sites should be avoided as far as possible. Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures have been followed.	

8. CONCLUSIONS

The aim of the survey was to broadly identify, evaluate and document sites, objects and structures of cultural significance found within the corridor alternatives in which it is proposed to develop a 132kV power line.

The following categories of heritage sites were identified as occurring in the study area:

- Farming and farming related activities, such as farmsteads, stock pens, windmills, etc.
- Buildings and sites of heritage significance in the various towns.
- Elements of local infrastructure such as a railway line and associated stations and other structures.
- Local and private cemeteries.

Sensitive areas:

- Rock outcrops in the region show signs of having being quarried by Stone Age people in order to obtain material for producing stone tools. In addition, in some cases rock engraving occur on some of the outcrops. Therefore, all outcrops should be avoided as far as possible.
- All farmsteads, occupied or not, should be buffered with a no-go zone of at least 100 metres from the last visible feature associated with the farmstead/homestead.
- All cemeteries should have a buffer of at least 20 metres from the outer most graves. Fortunately, many cemeteries are fenced off, which can then be used as a buffer.
- All other features such as bridges, station buildings, etc. should be buffered with a no-go zone of at least 20 metres.

Evaluation:

Proposed 132kV line: Uitkoms to Kliphoek

- At present all of the Alternatives seem to be suitable for the development of this corridor.
- Proposed 132kV line: Kliphoek to Panbult
 - At present Alternative 1 seem to be the least suitable proposition for the development of this corridor.

Recommendations:

- It is recommended that the preferred Alternatives are subjected to a “walk-down” by a heritage consultant to determine if there are any fatal flaws that would prevent to proposed development from taking place.

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9.3 Maps and aerial photographs

1: 50 000 Topocadastral maps: 2630CA, 2630CB, 2630CD, 2630CC

Google Earth

APPENDIX 1: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE RESOURCES

Significance

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. 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.

Matrix used for assessing the significance of each identified site/feature

1. 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 organisation of importance in history				
Does it have significance relating to the history of slavery				
2. Aesthetic value				
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group				
3. 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				
4. Social value				
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons				
5. Rarity				
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage				
6. Representivity				
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects				
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				
Importance 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.				
7. Sphere of Significance		High	Medium	Low
International				
National				
Provincial				
Regional				
Local				
Specific community				
8. Significance rating of feature				
1.	Low			
2.	Medium			
3.	High			

APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

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

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

In terms of cemeteries and graves the following (Section 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) 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.