eTHEMBENI CULTURAL HERITAGE

GIBB ENGINEERING & SCIENCE

Section 24G Application for the Ruigtevallei to Dreunberg 132 kV Powerline

Environmental Impact Report

PHASE 1 HERITAGE IMPACT ASSESSMENT

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15 July 2014

DECLARATION OF INDEPENDENCE

I, Leonard Outram van Schalkwyk, as duly authorised representative of eThembeni Cultural Heritage, hereby confirm my independence (as well as that of eThembeni Cultural Heritage) as the heritage specialist for the Section 24G Application for the Ruigtevallei to Dreunberg 132kV Powerline and declare that neither I nor eThembeni Cultural Heritage have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which Arcus GIBB was appointed as environmental assessment practitioner in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act) for the Section 24G Application for the Ruigtevallei to Dreunberg 132kV Powerline. I further declare that I am confident in the results of the studies undertaken and conclusions drawn as a result of it. I have disclosed, to the environmental assessment practitioner, in writing, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act. I have further provided the environmental assessment practitioner with written access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not. I am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 and any other specific and relevant legislation (national and provincial), policies, guidelines and best practice.

Signature: 

Full Name: Leonard Outram van Schalkwyk

Date: 4 June 2014
Title / Position: Director
Qualification(s): MA Archaeology
Experience (years/ months): 33 years 6 months
Registration(s): Association of Southern African Professional Archaeologists (ASAPA)
International Association of Impact Assessors South Africa (IAIAsa)

EXECUTIVE SUMMARY

Background

The Ruigtevallei – Dreunberg powerline is currently under construction. The powerline was subject to a Basic Assessment which received Environmental Authorisation on 29 November 2012. Three route alternatives were identified in the BA Report. eThembeni Cultural Heritage undertook a Phase 1 Heritage Impact Assessment of the three alternatives and submitted a report dated 31 October 2011 to the South African Heritage Resources Agency for review and comment. SAHRA upheld the recommendations of the report, which identified Route 3 as the preferred alternative. The Department of Environmental Affairs issued Environmental Authorisation for Route 3 to be constructed.

eThembeni proposed that an archaeologist complete a walk-down of the final selected power line route option and all other activity areas prior to the start of any construction activities and assess direct impacts on discrete resources such as archaeological sites. Eskom's preferred route in the original BA was Route 1 and they appointed Umlando to undertake the walk-down and heritage inspection. Umlando undertook this task and submitted a report to SAHRA, which was approved by the heritage authority. However, the BAR recommended Route 3, which was authorised by the DEA. Eskom nonetheless started construction on an alignment that was essentially Route 1 but with some deviations. This route is now being called Route 4 and for the purposes of this Section 24G report Route 4 is now Eskom's preferred route.

Eskom now seeks authorisation to complete construction along Route 4. eThembeni was appointed to undertake a walk-down of this route to identify any heritage resources already affected by the constructed line and that might be affected by its completion, and recommend mitigation measures. eThembeni was also tasked with assessing the other powerline route alternatives.

Heritage resources

Heritage resources potentially affected by Route alternatives 1 and 2 comprise archaeological occurrences occurring throughout the area and the landscape of the western and southern boundaries of Oviston Nature Reserve south of the !Gariep Dam.
Route alternative 3 potentially affects similar archaeological occurrences and the western boundary of the reserve.
Route alternative 4 potentially affects the same resources as alternatives 1 and 2, as well as graves located outside of a formal cemetery on the farm Murrayskop.

Mitigation measures and monitoring

For all route alternatives the low significance and abundance of archaeological occurrences does not warrant any mitigation, while impacts on landscapes and graves may be achieved through avoidance.

Alternative powerline routing

The impacts on heritage resources of Route alternatives 1 and 2 are essentially identical, affecting archaeological occurrences and the western and southern borders of the Oviston Nature Reserve landscape. Mitigation measures are not required for archaeological occurrences, while management of impacts on the landscape reduces the significance of such impacts to LOW. The impact of Route alternative 3 is even less, affecting archaeological occurrences and only the western border of the reserve, with the same mitigation options, but with potential effects on the landscape occurring over a much shorter distance.

However, abandoning Route alternative 4 in preference to any of the three other route alternatives is not advisable, for the following reasons:

- Leaving the existing though unstrung towers already erected for Route 4 will have an impact, albeit low, on the visual landscape that cannot be justified, since the line will not be operational.
- Removing the towers already erected for Route 4, and constructing Route alternative 3 cannot be justified, since the main impact of Route 4 (visual disturbance of the Oviston Nature Reserve landscape) has already been minimised by judicious tower placement.

Conclusion

Heritage resources potentially affected by Route alternative 4 are limited to archaeological occurrences occurring throughout the area; the landscape of Oviston Nature Reserve along its western and southern boundaries; and graves located outside of a formal cemetery on the farm Murrayskop.

The low significance and abundance of archaeological occurrences does not warrant any mitigation, while impacts on landscapes have already been minimised and impacts on graves may be achieved through avoidance.

Accordingly, we recommend that Eskom complete the construction of Route alternative 4, with the heritage mitigation proposed in this report and have submitted this report to the South African Heritage Resources Agency (SAHRA) in fulfilment of the requirements of the National Heritage Resources Act. If permission is granted for development to proceed, the client is reminded that the Act requires that a developer cease all work immediately and contact SAHRA should any heritage resources, as defined in the Act, be discovered during the course of development activities.

SECTION 24G APPLICATION FOR THE RUIGTEVALLEI TO DREUNBERG 132 KV POWERLINE

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ABBREVIATIONS

ASAPA	**Association of Southern African Professional Archaeologists**
BA	**Basic Assessment**
DEA	**Department of Environmental Affairs**
HIA	**Heritage Impact Assessment**
NHRA	**National Heritage Resources Act 25 of 1999, as amended**
SAHRA	**South African Heritage Resources Agency**

1 DETAILS OF SPECIALIST AND EXPERTISE

Len van Schalkwyk (fieldwork and report writing) is accredited by the Cultural Resources Management section of the Association of Southern African Professional Archaeologists (ASAPA) to undertake HIAs in South Africa. He is also a member of the ASAPA Cultural Resources Management Committee for 2011 and 2012. Mr van Schalkwyk has a master's degree in archaeology (specialising in the history of early farmers in southern Africa) from the University of Cape Town and 25 years' experience in heritage management.

He has worked on projects as diverse as the establishment of the Ondini Cultural Museum in Ulundi, the cultural management of Chobe National Park in Botswana and various archaeological excavations and oral history recording projects. He was part of the writing team that produced the KwaZulu-Natal Heritage Act 1997. He has worked with many rural communities to establish integrated heritage and land use plans and speaks good Zulu.

Mr van Schalkwyk left his position as assistant director of Amafa aKwaZulu-Natali, the provincial heritage management authority, to start eThembeni in partnership with Elizabeth Wahl, who was head of archaeology at Amafa at the time. Over the past fifteen years they have undertaken around 1000 Heritage Impact Assessments (HIAs) throughout South Africa, as well as in Mozambique.

Elizabeth Wahl (report writing) has a BA Honours in African Studies from the University of Cape Town and has completed various Masters courses in Heritage and Tourism at the University of KwaZulu-Natal. She is currently studying for an MPhil in the Conservation of the Built Environment at UCT. She is also a member of ASAPA.

Ms Wahl was an excavator and logistical coordinator for Glasgow University Archaeological Research Division's heritage programme at Isandlwana Battlefield; has undertaken numerous rock painting surveys in the uKhahlamba/Drakensberg Mountains, northern KwaZulu-Natal, the Cederberg and the Koue Bokkeveld in the Cape Province; and was the principal excavator of Scorpion Shelter in the Cape Province, and Lenjane and Crystal Shelters in KwaZulu-Natal.

Ms Wahl compiled the first cultural landscape management plan for the Mnweni Valley, northern uKhahlamba/Drakensberg, and undertook an assessment of and made recommendations for cultural heritage databases and organisational capacity in parts of Lesotho and South Africa for the Global Environment Facility of the World Bank for the Maloti Drakensberg Transfrontier Conservation and Development Area. She developed the first cultural heritage management plan for the uKhahlamba Drakensberg Park World Heritage Site, following UNESCO recommendations for rock art management in southern Africa.Details of the person who prepared the report and the expertise of the person to carry out the specialist study or specialised process.

2 INTRODUCTION

2.1 Background

The Ruigtevallei – Dreunberg powerline is currently under construction. The powerline was subject to a Basic Assessment (BA) which received Environmental Authorisation on 29 November 2012. Three route alternatives were identified in the BA Report and are shown in Figure 1. eThembeni Cultural Heritage undertook a Phase 1 Heritage Impact Assessment of the three alternatives and submitted a report dated 31 October 2011[i] to the South African Heritage Resources Agency (SAHRA) for review and comment. SAHRA upheld the recommendations of the report, which identified Route 3 as the preferred alternative. The Department of Environmental Affairs issued Environmental Authorisation for Route 3 to be constructed (green line on Figure 1).

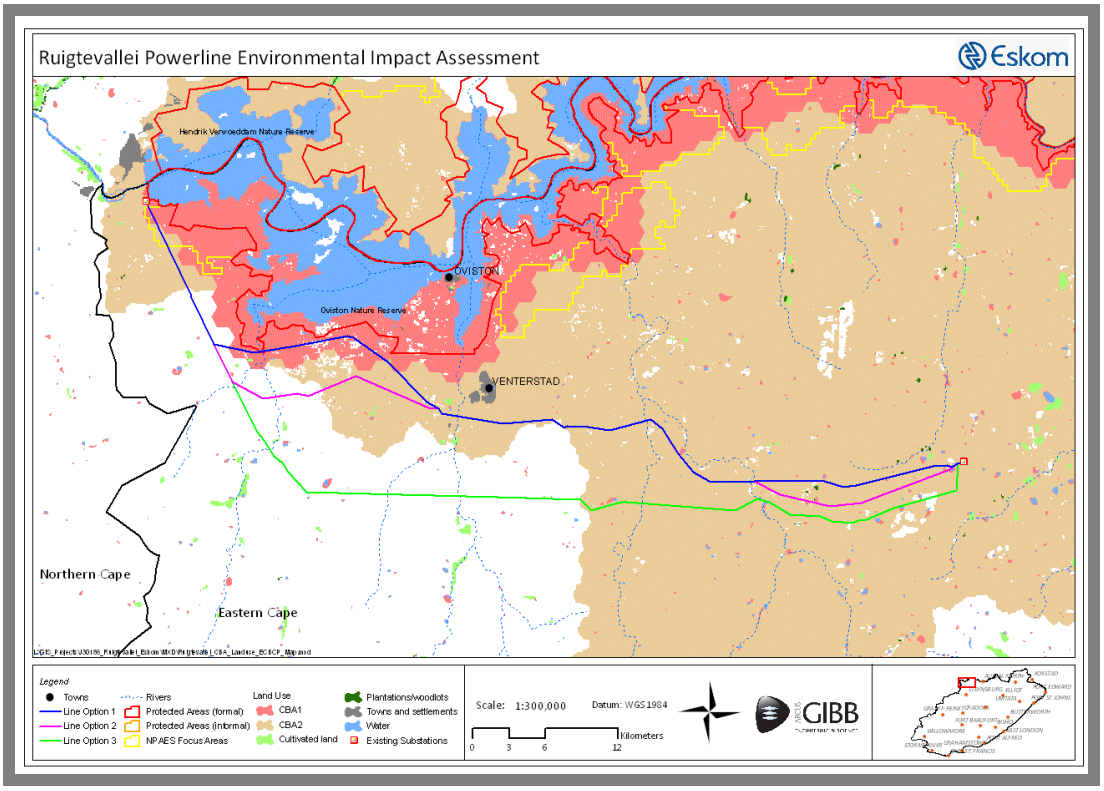

Figure 1: Original Ruigtevallei-Dreunberg powerline route alternatives.

eThembeni's 2011 report established that approximately one quarter to one third of the preferred Option 1 lies close to and within clear view of the Oviston Nature Reserve bordering the southern limits of the Gariep Dam. This protected area has at least medium to high heritage significance at the provincial level for its scientific and aesthetic values, with additional economic and social values as a recreational and tourism resource. The nature reserve is sensitive to visual intrusions that could detract from the sense of place of this 'big sky' landscape with vistas that continue uninterrupted for many kilometres. Accordingly, the impact significance of the proposed transmission line development on this landscape is potentially medium to high.

eThembeni recommended, therefore, that visual impacts on Oviston Nature Reserve and surrounding areas be avoided as far as possible, and Option 3 was chosen as the preferred route alternative for the project.

eThembeni proposed that an archaeologist complete a walk-down of the final selected power line route option and all other activity areas (access roads, construction camps, materials' storage areas, etc.) prior to the start of any construction activities and assess direct impacts on discrete resources such as archaeological sites.

Eskom's preferred route in the original BA was Route 1 and they appointed Umlando to undertake the walk-down and heritage inspection. Umlando undertook this task and submitted a report to SAHRA dated March 2013[ii], which was approved by the heritage authority. However, the BAR recommended Route 3, which was authorised by the DEA. Eskom nonetheless started construction on an alignment that was essentially Route 1 but with some deviations. This route is now being called Route 4 and for the purposes of this Section 24G report Route 4 is now Eskom's preferred route.

Eskom then commenced construction of Route 4 and now seeks authorisation to continue construction along this route (purple line), with various deviations, as illustrated in Figure 2 (see kml image uploaded separately). eThembeni was appointed to undertake a walk-down of Route 4 to identify any heritage resources already affected by the constructed line and that might be affected by its completion, and mitigation measures. eThembeni was also tasked with assessing the other powerline route alternatives.

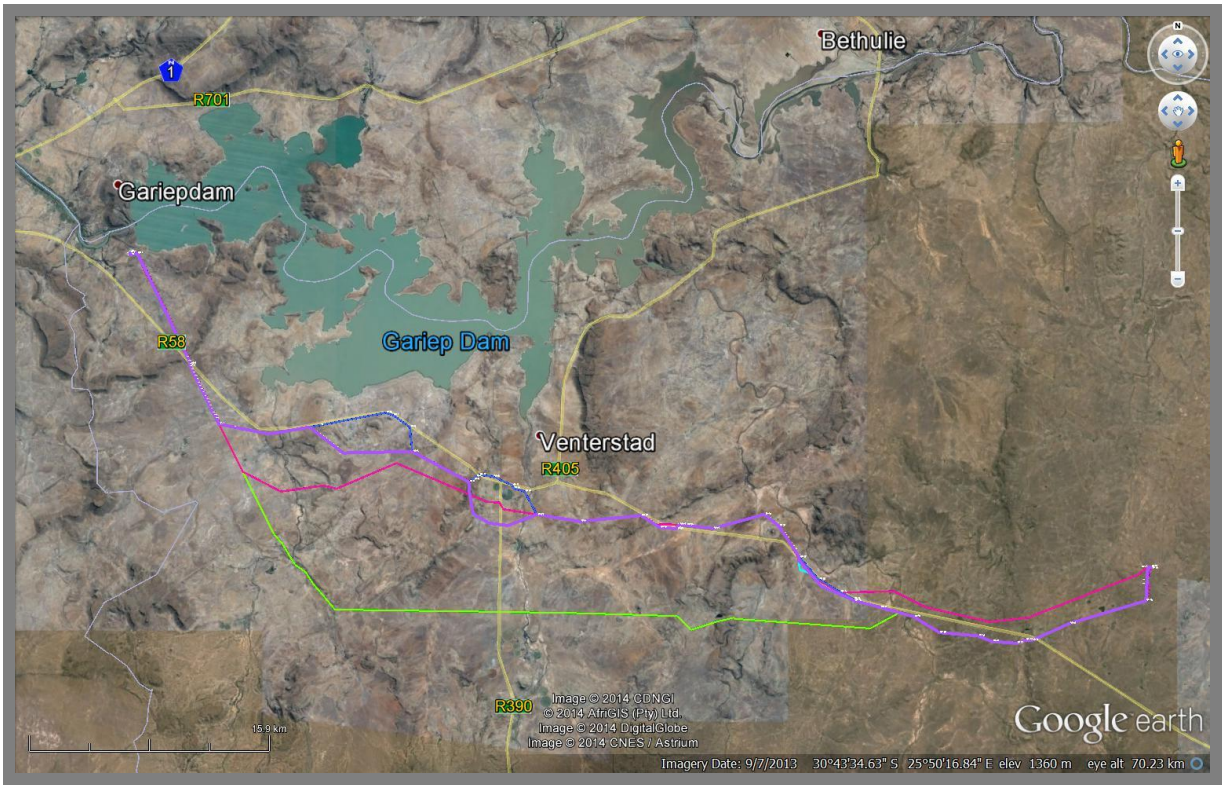

Figure 2: Section 24G Ruigtevallei-Dreunberg powerline route alternatives.

2.2 Legislative and Policy Context

General

The Constitution of the Republic of South Africa Act 108 of 1996 is the source of all legislation. Within the Constitution the Bill of Rights is fundamental, with the principle that the environment should be protected for present and future generations by preventing pollution, promoting conservation and practising ecologically sustainable development. With regard to spatial planning and related legislation at national and provincial levels the following legislation may be relevant:

- Physical Planning Act 125 of 1991
- Municipal Structures Act 117 of 1998
- Municipal Systems Act 32 of 2000
- Development Facilitation Act 67 of 1995

The identification, evaluation and management of heritage resources in the Eastern Cape Province is required and governed by the following legislation:

- National Environmental Management Act 107 of 1998
- National Heritage Resources Act 25 of 1999
- Minerals and Petroleum Resources Development Act 28 of 2002

National Heritage Resources Act 25 of 1999 (NHRA)

The NHRA established the South African Heritage Resources Agency (SAHRA) together with its Council to fulfill the following functions:

- co-ordinate and promote the management of heritage resources at national level;
- set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance;
- control the export of nationally significant heritage objects and the import into the Republic of cultural property illegally exported from foreign countries;
- enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources; and
- provide for the protection and management of conservation-worthy places and areas by local authorities.

2.2.1 Legislative requirements

Heritage Impact Assessments (HIAs)

Section 38(1) of the NHRA may require an HIA in case of:

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- the construction of a bridge or similar structure exceeding 50m in length;
- any development or other activity which will change the character of a site—
  (i) exceeding 5 000m² in extent; or
  (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;
- the re-zoning of a site exceeding 10 000m² in extent; or

- any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

It is incumbent upon the developer or Environmental Practitioner to approach SAHRA to ascertain whether an HIA is required for a project; what categories of heritage resource must be assessed; and request a detailed motivation for such a study in terms of both the nature of the development and the nature of the environment. The Environmental Practitioner may also submit information to the heritage authority in substantiation of exemption from a specific assessment due to existing environmental disturbance, for example.

2.2.2 Policy Requirements

The NHRA stipulates the following general principles for heritage resources management:

1(a) Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;
(b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;
(c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and
(d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.
2 To ensure that heritage resources are effectively managed—
(a) the skills and capacities of persons and communities involved in heritage resources management must be developed; and
(b) provision must be made for the ongoing education and training of existing and new heritage resources management workers.
3 Laws, procedures and administrative practices must—
(a) be clear and generally available to those affected thereby;
(b) in addition to serving as regulatory measures, also provide guidance and information to those affected thereby; and
(c) give further content to the fundamental rights set out in the Constitution.
4 Heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.
5 Heritage resources contribute significantly to research, education and tourism and they must be developed and presented for these purposes in a way that ensures dignity and respect for cultural values.
6 Policy, administrative practice and legislation must promote the integration of heritage resources conservation in urban and rural planning and social and economic development.
7 The identification, assessment and management of the heritage resources of South Africa must—
(a) take account of all relevant cultural values and indigenous knowledge systems;
(b) take account of material or cultural heritage value and involve the least possible alteration or loss of it;
(c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;
(d) contribute to social and economic development;
(e) safeguard the options of present and future generations; and
(f) be fully researched, documented and recorded.

2.2.3 Permit requirements

General

No person may disturb or alter any heritage resource, as defined in Section 2, without a permit from SAHRA.

Archaeological and palaeontological sites and meteorites

No person may, without a permit issued by SAHRA:

- Destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite
- Destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite
- Trade in, sell for private gain, export or attempt to export from South Africa any category of archaeological or palaeontological material or object, or any meteorite
- 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.

Graves and burial grounds

No person may damage, alter, exhume, or remove from its original position any grave, as defined in Section 2, without permission from SAHRA. SAHRA may not issue a permit for any alteration to or disinterment or reburial of a grave unless it is satisfied that the applicant has, in accordance with regulations made by SAHRA:

- Made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
- Reached agreements with such communities and individuals regarding the future of such grave or burial ground.

Any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to SAHRA which must, in co-operation with the South African Police Services and in accordance with regulations of SAHRA:

- Carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of the NHRA or is of significance to any community; and
- If such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

2.3 Scope and limitations

2.3.1 Report requirements

Reports in fulfilment of NHRA Section 38(3) must include the following information:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on such heritage resources;
- an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

2.3.2 Definitions of heritage resources

The NHRA defines a heritage resource as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes, but is not limited to, the following wide range of places and objects:

- living heritage as defined in the National Heritage Council Act 11 of 1999 (cultural tradition; oral history; performance; ritual; popular memory; skills and techniques; indigenous knowledge systems; and the holistic approach to nature, society and social relationships);
- places, buildings, structures and equipment;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds;
- public monuments and memorials;
- sites of significance relating to the history of slavery in South Africa;
- movable objects, but excluding any object made by a living person; and
- battlefields.

Furthermore, 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; and
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.

Archaeological means:

- material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act 15 of 1994, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

Palaeontological means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

A **place** is defined as:

- a site, area or region;
- a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure;
- a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures;
- an open space, including a public square, street or park; and
- in relation to the management of a place, includes the immediate surroundings of a place.

Public monuments and memorials means all monuments and memorials:

- erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government; or
- which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.

Structures means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

A **grave** is a place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such a place.

2.4 Assessment Methodology

Site survey

eThembeni staff members inspected the proposed activity area on 21-24 May 2013 and completed a controlled-exclusive surface survey, where 'sufficient information exists on an area to make solid and defensible assumptions and judgements about where [heritage resource] sites may and may not be' and 'an inspection of the surface of the ground, wherever this surface is visible, is made, with no substantial attempt to clear brush, turf, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures that are observed by accident'[iii].

The site survey comprised walking and driving along selected transects in areas that potentially included heritage resources such as archaeological sites along Route alternative 4 for its entire length, including an area within 100m on either side of tower position locations. We also walked and drove along selected, potentially sensitive sections of Route alternatives 2 and 3. Geographic coordinates were obtained using a handheld Garmin global positioning unit (WGS 84).

Database and literature review

Archaeological site data for the surrounding area is available on the SAHRIS database. A concise account of the archaeology of the broader study area was compiled from sources including those listed in the bibliography.

Public participation

We interviewed landowner Mr Jan Harms van Wyk of the farm Murrayskop regarding the presence of graves on his property.

Assessment of heritage resource value and significance

Heritage resources are significant only to the extent that they have public value, as demonstrated by the following guidelines for determining site significance developed by Heritage Western Cape[iv] and utilised during this assessment.

- **Grade I Sites (National Heritage Sites)**

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that:
Grade I heritage resources are heritage resources with qualities so exceptional that they are of special national significance should be applied to any heritage resource which is

a) Of outstanding significance in terms of one or more of the criteria set out in section 3(3) of the NHRA;
b) Authentic in terms of design, materials, workmanship or setting; and is of such universal value and symbolic importance that it can promote human understanding and contribute to nation building, and its loss would significantly diminish the national heritage.

1. Is the site of outstanding national significance?
2. Is the site the best possible representative of a national issue, event or group or person of national historical importance?
3. Does it fall within the proposed themes that are to be represented by National Heritage Sites?
4. Does the site contribute to nation building and reconciliation?
5. Does the site illustrate an issue or theme, or the side of an issue already represented by an existing National Heritage Site – or would the issue be better represented by another site?
6. Is the site authentic and intact?
7. Should the declaration be part of a serial declaration?
8. Is it appropriate that this site be managed at a national level?
9. What are the implications of not managing the site at national level?

- **Grade II Sites (Provincial Heritage Sites)**

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that:
Grade II heritage resources are those with special qualities which make them significant in the context of a province or region and should be applied to any heritage resource which

- is of great significance in terms of one or more of the criteria set out in section 3(3) of the NHRA; and
- enriches the understanding of cultural, historical, social and scientific development in the province or region in which it is situated, but that does not fulfil the criteria for Grade 1 status.

Grade II sites may include, but are not limited to –

- places, buildings, structures and immovable 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; and
- graves and burial grounds.

The cultural significance or other special value that Grade II sites may have, could include, but are not limited to –

- its importance in the community or pattern of the history of the province;
- the uncommon, rare or endangered aspects that it possess reflecting the province's natural or cultural heritage

- the potential that the site may yield information that will contribute to an understanding of the province's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of the province's natural or cultural places or objects;
- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group in the province;
- its importance in demonstrating a high degree of creative or technical achievement at a particular period in the development or history of the province;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; and
- its strong or special association with the life or work of a person, group or organization of importance in the history of the province.

Grade III (Local Heritage Resources)
Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that:
Grade III heritage status should be applied to any heritage resource which

- fulfils one or more of the criteria set out in section 3(3) of the NHRA; or
- in the case of a site contributes to the environmental quality or cultural significance of a larger area which fulfils one of the above criteria, but that does not fulfill the criteria for Grade 2 status.

Grade IIIA
This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant *any* alteration being regulated. The significances of these buildings and/or sites should include at least some of the following characteristics:

- Highly significant association with a historic person, social grouping, historic events, historical activities or roles, and/or public memory
- Historical and/or visual-spatial landmark within a place
- High architectural quality, well-constructed and of fine materials
- Historical fabric is mostly intact (this fabric may be layered historically and/or past damage should be easily reversible)
- Fabric dates to the early origins of a place
- Fabric clearly illustrates an historical period in the evolution of a place
- Fabric clearly illustrates the key uses and roles of a place over time
- Contributes significantly to the environmental quality of a Grade I or Grade II heritage resource or a conservation/heritage area

Such buildings and sites may be representative, being excellent examples of their kind, or may be rare: as such they should receive maximum protection at local level.

Grade IIIB
This grading is applied to buildings and/or sites of a marginally lesser significance than grade IIIA; and such marginally lesser significance argues against the regulation of internal alterations. Such buildings and sites may have similar significances to those of a grade IIIA building or site, but to a lesser degree. Like grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than grade IIIA examples: as such they should receive less stringent protection than grade IIIA buildings and sites at local level and internal alterations should not be regulated (in this context).

Grade IIIC
This grading is applied to buildings and/or sites whose significance is, in large part, a significance that contributes to the character or significance of the environs. These buildings and sites should, as a consequence, only be protected and regulated *if the significance of the environs is sufficient to warrant protective measures*. In other words, these buildings and/or sites will only be protected if they are within declared conservation or heritage areas.

2.4.1 Study Area Sensitivity Analysis

Heritage resources in and around the study area in the Eastern Cape that could require the modification and/or relocation of a proposed development project and/or significant mitigation procedures are listed in the following table. Subsurface remains of these and other heritage resources might also be present.

Table 1 Typical heritage resources and mitigation measures associated with the project area.

Heritage resource	Typical mitigation measures
Formally protected and/or otherwise recognised landscapes and natural features, including nature reserves and scenic routes.	Routing powerline infrastructure in such a way that impact on heritage resources is minimised, such as avoiding breaking the skyline, for example.
Open air scatters of Stone Age stone artefacts and Iron Age archaeological sites with ceramic sherds, probably with low heritage significance, could occur in areas with minimal environmental disturbance.	Test excavations to determine site extent and significance. If necessary, full systematic archaeological excavations requiring permit from heritage authority and significant financial expenditure.
Ancestral graves, typically located within homestead precincts. They are often associated with abandoned homesteads and may be difficult to identify if unmarked.	All human remains have high heritage significance and conservation *in situ* is always preferred, since exhumation and reburial are costly and time-consuming.

2.5 Description of any Assumptions Made, Uncertainties or Gaps in Knowledge

The assumptions and limitations of this HIA are as follows:

- The description of the proposed project, provided by the client, is accurate.
- Soil surface visibility was good to moderate. Heritage resources might be present below the surface or in areas of dense vegetation and we remind the client that the NHRA requires that a developer cease all work immediately and notify SAHRA should any heritage resources, as defined in the Act, be discovered during the course of development activities.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from SAHRA is required to disturb a heritage resource.
- A key concept in the management of heritage resources is that of non-renewability: damage to or destruction of most resources, including that caused by bona fide research endeavours, cannot be reversed or undone. Accordingly, management recommendations for heritage resources in the

context of development are as conservative as possible, according to the precautionary principle.

- Human sciences are necessarily both subjective and objective in nature. eThembeni strives to manage heritage resources to the highest standards in accordance with national and international best practice, but recognise that our opinions might differ from those of other heritage practitioners.
- Staff members involved in this project have no vested interest in it; are qualified to undertake the tasks as described in the terms of reference; and comply at all times with the Codes of Ethics and Conduct of ASAPA.
- eThembeni staff members take no personal or professional responsibility for the misuse of the information contained in this report, although they take all reasonable precautions against such misuse.

3 DESCRIPTION OF AFFECTED ENVIRONMENT

As stated in Section 2.4.1, typical heritage resources associated with the project area are likely to be Stone and Iron Age archaeological sites, landscapes and natural features and ancestral graves. Accordingly, we summarise the archaeological and historical context of the area below.

In archaeological terms South Africa's prehistory has been divided into a series of phases based on broad patterns of technology. The primary distinction is between a reliance on chipped and flaked stone implements (the Stone Age), the ability to work iron (the Iron Age) and the Colonial Period, characterised by the advent of writing and in southern Africa primarily associated with the first European travellers (Mitchell 2002). Spanning a large proportion of human history, the Stone Age in Southern Africa is further divided into the Early Stone Age, or Paleolithic Period (about 2 500 000–150 000 years ago), the Middle Stone Age, or Mesolithic Period (about 500 000–30 000 years ago), and the Late Stone Age, or Neolithic Period (about 30 000–2 000 years ago). The simple stone tools found with australopithecine fossil bones fall into the earliest part of the Early Stone Age.

The Stone Age[v]

- Early Stone Age

Most Early Stone Age sites in South Africa can probably be connected with the hominin species known as *Homo erectus*. Simply modified stones, hand axes, scraping tools, and other bifacial artifacts had a wide variety of purposes, including butchering animal carcasses, scraping hides, and digging for plant foods. Most South African archaeological sites from this period are the remains of open camps, often by the sides of rivers and lakes, although some are rock shelters, such as Montagu Cave in the Cape region.

- Middle Stone Age

The long episode of cultural and physical evolution gave way to a period of more rapid change about 120 000 years ago. Hand axes and large bifacial stone tools were replaced by stone flakes and blades that were fashioned into scrapers, spear points, and parts for hafted, composite implements. This technological stage, now known as the Middle Stone Age, is represented by numerous sites in South Africa.

Open camps and rock overhangs were used for shelter. Day-to-day debris has survived to provide some evidence of early ways of life, although plant foods have rarely been preserved. Middle Stone Age bands hunted medium-sized and large prey, including antelope and zebra, although they tended to avoid the largest and most dangerous animals, such as the elephant and the rhinoceros. They also ate seabirds and marine mammals that could be found along the shore and sometimes collected tortoises and ostrich eggs in large quantities.

The Middle Stone Age is perhaps most significant as the time period during which the first modern humans, *Homo sapiens sapiens*, emerged between 120 000 and 30 000 years ago. The Klasies River cave complex, located on the southern Cape coast contains the oldest remains of anatomically modern humans in the world, dating to around 110 000 years ago[vi] [vii]. Humans were anatomically modern by 110 000 years ago but only developed into culturally modern behaving humans between 80 000 and 70 000 years ago, during cultural phases known as the Still Bay and Howieson's Poort time periods or stone tool traditions.

- The Late Stone Age

Basic toolmaking techniques began to undergo additional change about 40 000 years ago. Small finely worked stone implements known as microliths became more common, while the heavier scrapers and points of the Middle Stone Age appeared less frequently. Archaeologists refer to this technological stage as the Later Stone Age or LSA, which can be divided into four broad temporal units directly associated with climatic, technological and subsistence changes[viii]:

1. Late Pleistocene microlithic assemblages (40-12 000 years ago);
2. Terminal Pleistocene / early Holocene non-microlithic (macrolithic) assemblages (12-8 000 years ago);
3. Holocene microlithic assemblages (8 000 years ago to the Colonial Period); and
4. Holocene assemblages with pottery (2 000 years ago to the Historic Period) closely associated with the arrival of pastoralist communities into South Africa[ix x].

Animals were trapped and hunted with spears and arrows on which were mounted well-crafted stone blades. Bands moved with the seasons as they followed game into higher lands in the spring and early summer months, when plant foods could also be found. When available, rock overhangs became shelters; otherwise, windbreaks were built. Shellfish, crayfish, seals, and seabirds were also important sources of food, as were fish caught on lines, with spears, in traps, and possibly with nets.

Elements of material culture characteristic of the Late Stone Age that reflect cultural modernity have been summarised as follows[xi]:

- Symbolic and representational art (paintings and engravings);
- Items of personal adornment such as decorated ostrich eggshell, decorated bone tools and beads, pendants and amulets of ostrich eggshell, marine and freshwater shells;
- Specialized hunting and fishing equipment in the form of bows and arrows, fish hooks and sinkers;
- A greater variety of specialized tools including bone needles and awls and bone skin-working tools;
- Specialized food gathering tools and containers such as bored stone digging stick weights, carrying bags of leather and netting, ostrich eggshell water containers, tortoiseshell bowls and scoops and later pottery and stone bowls;
- Formal burial of the dead in graves, sometimes covered with painted stones or grindstones and accompanied by grave goods;
- The miniaturization of selected stone tools linked to the practice of hafting for composite tools production; and
- A characteristic range of specialized tools designed for making some of the items listed above.

Iron Age[xii xiii xiv]

Archaeological evidence shows that Bantu-speaking agriculturists first settled in southern Africa around AD 300. Bantu-speakers originated in the vicinity of modem Cameroon from where they began to move eastwards and southwards, some time after 400 BC, skirting around the equatorial forest. An extremely rapid spread throughout much of sub-equatorial Africa followed: dating shows that the earliest communities in Tanzania and South Africa are separated in time by only 200 years, despite the 3 000 km distance between the two regions. It seems likely that the speed of the spread was a consequence of agriculturists deliberately seeking iron ore

sources and particular combinations of soil and climate suitable for the cultivation of their crops.

The earliest agricultural sites in KwaZulu-Natal date to between AD 400 and 550. All are situated close to sources of iron ore, and within 15 km of the coast. Current evidence suggests it may have been too dry further inland at this time for successful cultivation. From 650 onwards, however, climatic conditions improved and agriculturists expanded into the valleys of KwaZulu-Natal, where they settled close to rivers in savanna or bushveld environments. There is a considerable body of information available about these early agriculturists.

Seed remains show that they cultivated finger millet, bulrush millet, sorghum and probably the African melon. It seems likely that they also planted African groundnuts and cowpeas, though direct evidence for these plants is lacking from the earlier periods. Faunal remains indicate that they kept sheep, cattle, goats, chickens and dogs, with cattle and sheep providing most of the meat. Men hunted, perhaps with dogs, but hunted animals made only a limited contribution to the diet in the region.

Metal production was a key activity since it provided the tools of cultivation and hunting. The evidence indicates that people who worked metal lived in almost every village, even those that were considerable distances from ore sources.

Large-scale excavations in recent years have provided data indicating that first-millennium agriculturist society was patrilineal and that men used cattle as bridewealth in exchange for wives. On a political level, society was organised into chiefdoms that, in our region, may have had up to three hierarchical levels. The villages of chiefs tended to be larger than others, with several livestock enclosures, and some were occupied continuously for lengthy periods. Social forces of the time resulted in the concentration of unusual items on these sites. These include artefacts that originated from great distances, ivory items (which as early as AD 700 appear to have been a symbol of chieftainship), and initiation paraphernalia.

This particular way of life came to an end around AD 1000, for reasons that we do not yet fully understand. There was a radical change in the decorative style of agriculturist ceramics at this time, while the preferred village locations of the last four centuries were abandoned in favour of sites along the coastal littoral. In general, sites dating to between 1050 and 1250 are smaller than most earlier agriculturist settlements. It is tempting to see in this change the origin of the Nguni settlement pattern. Indeed, some archaeologists have suggested that the changes were a result of the movement into the region of people who were directly ancestral to the Nguni-speakers of today. Others prefer to see the change as the product of social and cultural restructuring within resident agriculturist communities.

Whatever the case, it seems likely that this new pattern of settlement was in some way influenced by a changing climate, for there is evidence of increasing aridity from about AD 900. A new pattern of economic inter-dependence evolved that is substantially different from that of earlier centuries, and is one that continued into the colonial period nearly 500 years later.

Colonial rule[xv]

By the closing decades of the 18th century, South Africa had fallen into two broad regions: west and east. Colonial settlement dominated the west, including the winter rainfall region around the Cape of Good Hope, the coastal hinterland northward toward the present-day border with Namibia, and the dry lands of the interior. Trekboers took increasingly more land from the Khoekhoe and from remnant hunter-gatherer communities, who were killed, were forced into marginal areas, or became labourers tied to the farms of their new overlords. Indigenous farmers controlled both the coastal and valley lowlands and the Highveld of the interior in the east, where summer rainfall and good grazing made mixed farming economies possible.

A large group of British settlers arrived in the eastern Cape in 1820; this, together with a high European birth rate and wasteful land usage, produced an acute land shortage, which was alleviated only when the British acquired more land through massive military intervention against Africans on the eastern frontier. Until the 1840s the British vision of the colony did not include African citizens (referred to pejoratively by the British as "Kaffirs"), so, as Africans lost their land, they were expelled across the Great Fish River, the unilaterally proclaimed eastern border of the colony.

The first step in this process included attacks in 1811–12 by the British army on the Xhosa groups, the Gqunukhwebe and Ndlambe. An attack by the Rharhabe-Xhosa on Graham's Town in 1819 provided the pretext for the annexation of more African territory, to the Keiskamma River. Various Rharhabe-Xhosa groups were driven from their lands throughout the early 1830s. They counterattacked in December 1834, and Governor Benjamin D'Urban ordered a major invasion the following year, during which thousands of Rharhabe-Xhosa died. The British crossed the Great Kei River and ravaged territory of the Gcaleka-Xhosa as well; the Gcaleka chief, Hintsa, invited to hold discussions with British military officials, was held hostage and died trying to escape. The British colonial secretary, Lord Glenelg, who disapproved of D'Urban's policy, halted the seizure of all African land east of the Great Kei. D'Urban's initial attempt to rule conquered Africans with European magistrates and soldiers was overturned by Glenelg; instead, for a time, Africans east of the Keiskamma retained their autonomy and dealt with the colony through diplomatic agents.

However, after further fighting with the Rharhabe-Xhosa on the eastern frontier in 1846, Governor Colonel Harry Smith finally annexed, over the next two years, not only the region between the Great Fish and the Great Kei rivers (establishing British Kaffraria) but also a large area between the Orange and Vaal rivers, thus establishing the Orange River Sovereignty. These moves provoked further warfare in 1851–53 with the Xhosa (joined once more by many Khoe), with a few British politicians ineffectively trying to influence events.

Between 1811 and 1858 colonial aggression deprived Africans of most of their land between the Sundays and Great Kei rivers and produced poverty and despair. From the mid-1850s British magistrates held political power in British Kaffraria, destroying the power of the Xhosa chiefs. Following a severe lung sickness epidemic among their cattle in 1854–56, the Xhosa killed many of their remaining cattle and in 1857–58 grew few crops in response to a millenarian prophecy that this would cause their ancestors to rise from the dead and destroy the whites. Many thousands of Xhosa starved to death, and large numbers of survivors were driven into the Cape Colony to work. British Kaffraria fused with the Cape Colony in 1865, and thousands of Africans newly defined as Fingo resettled east of the Great Kei, thereby creating Fingoland. The Transkei, as this region came to be known, consisted of the hilly country between the Cape and Natal. It became a large African reserve and grew in size when those

parts that were still independent were annexed in the 1880s and 90s (Pondoland lost its independence in 1894).

Under apartheid blacks were treated like ‘tribal’ people and were required to live on reserves under hereditary chiefs except when they worked temporarily in white towns or on white farms. The government began to consolidate the scattered reserves into eight (eventually ten) distinct territories, designating each of them as the ‘homeland’, or Bantustan, of a specific black ethnic community. The government manipulated homeland politics so that compliant chiefs controlled the administrations of most of those territories. Arguing that Bantustans matched the decolonization process then taking place in tropical Africa, the government devolved powers onto those administrations and eventually encouraged them to become ‘independent’. Between 1976 and 1981 four accepted independence—Transkei, Bophuthatswana, Venda, and Ciskei—though none was ever recognized by a foreign government. Like the other homelands, however, they were economic backwaters, dependent on subsidies from Pretoria.

Conditions in the homelands continued to deteriorate, partly because they had to accommodate vast numbers of people with minimal resources. Many people found their way to the towns; but the government, attempting to reverse this flood, strengthened the pass laws by making it illegal for blacks to be in a town for more than 72 hours at a time without a job in a white home or business. A particularly brutal series of forced removals were conducted from the 1960s to the early 80s, in which more than 3.5 million black people were taken from towns and white rural areas (including lands they had occupied for generations) and dumped into the reserves, sometimes in the middle of winter and without any facilities.

3.1 Sensitivity of the affected environment

3.1.1 Archaeological sites

Most archaeological sites in the study area are likely to have low heritage significance at all levels for their scientific value, due to their ubiquitous occurrence in the landscape, and their lack of association with deposits containing artefacts other than stone cores and flakes. Accordingly, such heritage resources are able to tolerate relatively high levels of disturbance without a marked impact on their significance, and could be categorised as having a high tolerance to disturbance (i.e. ‘low sensitivity’ heritage resource).

3.1.2 Landscapes and natural features

Visually sensitive landscapes and natural features with medium to high heritage significance for their aesthetic and economic values are likely to occur in the area, given its location near the !Gariep Dam, its agrarian nature and the general lack of development. Accordingly, such heritage resources are able to tolerate only low to medium levels of disturbance without a marked impact on their significance, and could be categorised as having a low to moderate tolerance to disturbance (i.e. ‘medium to high sensitivity’ heritage resource).

3.1.3 Ancestral graves

Graves in the study area are likely to be associated with occupied or abandoned homesteads and may be marked or unmarked. All human remains have high heritage significance at all levels for their spiritual, social and cultural values; conservation *in situ* is always preferred; and exhumation and reburial require costly and time-consuming procedures. Accordingly, such heritage resources are unable to tolerate any level of disturbance without a marked impact on their significance, and could be categorised as having a low tolerance to disturbance (i.e. 'high sensitivity' heritage resource).

4 IMPACTS IDENTIFICATION AND ASSESSMENT

4.1 Introduction

A heritage resource impact may be defined broadly as the net change, either beneficial or adverse, between the integrity of a heritage site with and without the proposed development. Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource, by minimising natural site erosion or facilitating non-destructive public use, for example. More commonly, development impacts are of an adverse nature and can include:

- destruction or alteration of all or part of a heritage site;
- isolation of a site from its natural setting; and / or
- introduction of physical, chemical or visual elements that are out of character with the heritage resource and its setting.

Beneficial and adverse impacts can be direct or indirect, as well as cumulative, as implied by the aforementioned examples. Although indirect impacts may be more difficult to foresee, assess and quantify, they must form part of the assessment process.

4.2 Impact Assessment Methodology

Impacts on heritage resources are described and evaluated in terms of the criteria in Table 2.

Table 2: Impact assessment rating criteria.

Criteria	Rating Scales	Notes
Nature	**Positive**	This is an evaluation of the type of effect the construction, operation and management of the proposed development would have on the affected environment. Would it be positive, negative or neutral?
	Negative	
	Neutral	
Extent	**Low**	Site-specific, affects only the development footprint
	Medium	Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);
	High	Regional (beyond a 10 km radius) to national
Duration	**Low**	Short-term: 0-5 years, typically impacts that are quickly reversible within the construction phase of the project
	Medium	Medium-term, 6-10 years, reversible over time
	High	Long-term, 10-60 years, and continue for the operational life span of the development
Intensity	**Low**	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected
	Medium	Where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected
	High	Where natural, cultural or social functions and processes are altered to the extent that the impact will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.

Degree of Reversibility.	**Low**	Impacted natural, cultural or social functions and processes will return to their pre-impacted state within the short-term.
	Medium	Impacted natural, cultural or social functions and processes will return to their pre-impacted state within the medium to long term.
	High	Impacted natural, cultural or social functions and processes will never return to their pre-impacted state.
Potential for impact on irreplaceable resources	**Low**	No irreplaceable resources will be impacted.
	Medium	Resources that will be impacted can be replaced, with effort.
	High	There is no potential for replacing a particular vulnerable resource that will be impacted.
Consequence	**Low**	A combination of any of the following • Intensity, duration, extent and impact on irreplaceable resources are all rated low • Intensity, duration and extent are rated low but impact on irreplaceable resources is rated medium to high • Intensity is low and up to two of the other criteria are rated medium • Intensity is medium and all three other criteria are rated low
	Medium	• Intensity is medium and one other criteria is rated high, with the remainder being rated low • Intensity is low and at least two other criteria are rated medium or higher • Intensity is rated medium and at least two of the other criteria are rated medium or higher • Intensity is high and at least two other criteria are medium or higher • Intensity is rated low, but irreplaceability and duration are rated high
	High	• Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration • Intensity is rated high, with all of the other criteria being rated medium or higher
Probability	**Low**	Improbable. It is highly unlikely or less than 50 % likely that an impact will occur.
	Medium	Distinct possibility. It is between 50 and 70 % certain that the impact will occur.
	High	Most likely. It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.
Significance	**Low**	• Low consequence and low probability • Low consequence and medium probability • Low consequence and high probability
	Low to medium	• Low consequence and high probability • Medium consequence and low probability
	Medium	• Medium consequence and low probability • Medium consequence and medium probability • Medium consequence and high probability • High consequence and low probability
	Medium to high	• High consequence and medium probability
	High	• High consequence and high probability
Degree of confidence in predictions	**Low** **Medium** **High**	

4.3 Impact Assessment – Proposed Development

4.3.1 Construction Phase

Table 3: Description of heritage resources affected by Route Alternative 1.

Type	Location	Description	Significance	Impact	Mitigation
Archaeological occurrences	Ubiquitous throughout study area, as described in Umlando (2013). See Plate 1 in Appendix.	Very low density scatters of Middle and Later Stone Age stone artefacts comprising largely *debitage* of knapping processes; no formal tools observed.	Low heritage significance for scientific value	Possible displacement of isolated stone artefacts	None
Landscapes	Along southern shoreline of !Gariep Dam from dam wall on west to Bethulie railroad bridge in east, as described in eThembeni (2011).	Western and southern boundaries of Oviston Nature Reserve	Medium-high heritage significance at provincial level for scientific and aesthetic values, with additional economic and social values as recreational and tourism resource	Visual intrusions that could detract from the sense of place of this 'big sky' landscape with vistas that continue uninterrupted for many kilometres	Avoidance by routing infrastructure at least 1km away from reserve, and/or within existing infrastructure servitudes, and/or 'behind' natural features such as hills.
Graves	Father's grave: 30° 48' 01.59"S 25° 56' 52.75E Northern tenant grave: 30° 48' 02.17"S 25° 56' 57.91E Southern tenant grave: 30° 48' 03.31"S 25° 56' 57.94E See Plates 2-4 in Appendix.	Grave of father of Mr Jan Harms van Wyk of farm Murrayskop; buried January 2014. Further >22 unmarked very indistinct labour tenants' graves in immediate vicinity. NOTE that these are not the graves identified in Umlando (2013).	High heritage significance at all levels for spiritual, social and cultural values	Alteration or destruction caused by construction of tower platforms and other activity areas. Overhead lines crossing graves have no impact.	Location of graves adjacent to powerline servitude illustrated in Plate 4 in Appendix. Avoidance by routing tower infrastructure at least 50m away from graves to avoid direct impacts (overhead lines may cross graves but see Section 4.3.2)[1].

[1] However, Mr van Wyk does not want a powerline on his property and prefers the use of alternative route (L van Schalkwyk pers. comm.).

Table 4: Description of heritage resources affected by Route Alternative 2.

Type	Location	Description	Significance	Impact	Mitigation
Archaeological occurrences	Ubiquitous throughout study area, as described in Umlando (2013). See Plate 1 in Appendix.	Very low density scatters of Middle and Later Stone Age stone artefacts comprising largely *debitage* of knapping processes; no formal tools observed.	Low heritage significance for scientific value	Possible displacement of isolated stone artefacts	None
Landscapes	Along southern shoreline of !Gariep Dam from dam wall on west to Bethulie railroad bridge in east as described in eThembeni (2011).	Western and southern boundaries of Oviston Nature Reserve	Medium-high heritage significance at provincial level for scientific and aesthetic values, with additional economic and social values as recreational and tourism resource	Visual intrusions that could detract from the sense of place of this 'big sky' landscape with vistas that continue uninterrupted for many kilometres	Avoidance by routing infrastructure at least 1km away from reserve, and/or within existing infrastructure servitudes, and/or 'behind' natural features such as hills.
Graves	Father's grave: 30° 48' 01.59"S 25° 56' 52.75E Northern tenant grave: 30° 48' 02.17"S 25° 56' 57.91E Southern tenant grave: 30° 48' 03.31"S 25° 56' 57.94E See Plates 2-4 in Appendix.	Grave of father of Mr Jan Harms van Wyk of farm Murrayskop; buried January 2014. Further >22 unmarked very indistinct labour tenants' graves in immediate vicinity. NOTE that these are not the graves identified in Umlando (2013).	High heritage significance at all levels for spiritual, social and cultural values	Alteration or destruction caused by construction of tower platforms and other activity areas. Overhead lines crossing graves have no impact.	Location of graves adjacent to powerline servitude illustrated in Plate 4 in Appendix. Avoidance by routing tower infrastructure at least 50m away from graves to avoid direct impacts (overhead lines may cross graves but see Section 4.3.2).

Table 5: Description of heritage resources affected by Route Alternative 3.

Type	Location	Description	Significance	Impact	Mitigation
Archaeological occurrences	Ubiquitous throughout study area, as described in Umlando (2013). See Plate 1 in Appendix.	Very low density scatters of Middle and Later Stone Age stone artefacts comprising largely *debitage* of knapping processes; no formal tools observed.	Low heritage significance for scientific value	Possible displacement of isolated stone artefacts	None
Landscapes	Along southern shoreline of !Gariep Dam from dam wall on west to Bethulie railroad bridge in east	Western boundary only of Oviston Nature Reserve	Medium-high heritage significance at provincial level for scientific and aesthetic values, with additional economic and social values as recreational and tourism resource	Visual intrusions that could detract from the sense of place of this 'big sky' landscape with vistas that continue uninterrupted for many kilometres	Avoidance by routing infrastructure at least 1km away from reserve, and/or within existing infrastructure servitudes, and/or 'behind' natural features such as hills.

Table 6: Description of heritage resources affected by Route alternative 4.

Type	Location	Description	Significance	Impact	Mitigation
Archaeological occurrences	Ubiquitous throughout study area, as described in Umlando (2013). See Plate 1 in Appendix.	Very low density scatters of Middle and Later Stone Age stone artefacts comprising largely *debitage* of knapping processes; no formal tools observed.	Low heritage significance for scientific value	Possible displacement of isolated stone artefacts	None
Landscapes	Along southern shoreline of !Gariep Dam from dam wall on west to Bethulie railroad bridge in east	Western and southern boundaries of Oviston Nature Reserve	Medium-high heritage significance at provincial level for scientific and aesthetic values, with additional economic and social values as recreational and tourism resource	Visual intrusions that could detract from the sense of place of this 'big sky' landscape with vistas that continue uninterrupted for many kilometres	Avoidance by routing infrastructure at least 1km away from reserve, and/or within existing infrastructure servitudes, and/or 'behind' natural features such as hills.
Graves	Father's grave: 30° 48' 01.59"S 25° 56' 52.75E Northern tenant grave: 30° 48' 02.17"S 25° 56' 57.91E Southern tenant grave: 30° 48' 03.31"S 25° 56' 57.94E See Plates 2-4 in Appendix.	Grave of father of Mr Jan Harms van Wyk of farm Murrayskop; buried January 2014. Further >22 unmarked very indistinct labour tenants' graves in immediate vicinity. NOTE that these are not the graves identified in Umlando (2013).	High heritage significance at all levels for spiritual, social and cultural values	Alteration or destruction caused by construction of tower platforms and other activity areas. Overhead lines crossing graves have no impact.	Location of graves adjacent to powerline servitude illustrated in Plate 4 in Appendix. Avoidance by routing tower infrastructure at least 50m away from graves to avoid direct impacts (overhead lines may cross graves but see Section 4.3.2).

Table 7: Impacts on heritage resources affected by Route alternative 1 in construction phase.

Heritage resource		Impact									
		Nature	**Extent**	**Duration**	**Intensity**	**Reversibility**	**Impact on irreplaceable resources**	**Consequence**	**Probability**	**Significance**	**Confidence**
Archaeological occurrences	**Unmanaged**	Neutral-Negative	Low	High	Low	High	Low	Low	Medium-High	Low	High
	Managed	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Landscapes	**Unmanaged**	Negative	Medium	High	Medium-High	Medium-High	Medium	Medium-High	Medium-High	Medium-High	Medium-High
	Managed	Neutral	Medium	Low	Low-Medium	Low	Low-Medium	Low-Medium	Low	Low-Medium	High
Graves	**Unmanaged**	Negative	Low	High	High	High	High	High	High	High	High
	Managed	Neutral	Low	High	Low	Low	Low	Low	Low	Low	High

Table 8: Impacts on heritage resources affected by Route alternative 2 in construction phase.

Heritage resource		Impact									
		Nature	**Extent**	**Duration**	**Intensity**	**Reversibility**	**Impact on irreplaceable resources**	**Consequence**	**Probability**	**Significance**	**Confidence**
Archaeological occurrences	**Unmanaged**	Neutral-Negative	Low	High	Low	High	Low	Low	Medium-High	Low	High
	Managed	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Landscapes	**Unmanaged**	Negative	Medium	High	Medium-High	Medium-High	Medium	Medium-High	Medium-High	Medium-High	Medium-High
	Managed	Neutral	Medium	Low	Low	Low	Low	Low	Low	Low	High
Graves	**Unmanaged**	Negative	Low	High	High	High	High	High	High	High	High
	Managed	Neutral	Low	High	Low	Low	Low	Low	Low	Low	High

Table 9: Impacts on heritage resources affected by Route alternative 3 in construction phase.

Heritage resource		Impact									
		Nature	**Extent**	**Duration**	**Intensity**	**Reversibility**	**Impact on irreplaceable resources**	**Consequence**	**Probability**	**Significance**	**Confidence**
Archaeological occurrences	**Unmanaged**	Neutral-Negative	Low	High	Low	High	Low	Low	Medium-High	Low	High
	Managed	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Landscapes	**Unmanaged**	Negative	Medium	High	Low-Medium	Medium	Low-Medium	Medium	Medium-High	Medium	Medium-High
	Managed	Neutral	Medium	Low	Low	Low	Low	Low	Low	Low	High

Table 10: Impacts on heritage resources affected by Route alternative 4 in construction phase.

Heritage resource		Impact									
		Nature	**Extent**	**Duration**	**Intensity**	**Reversibility**	**Impact on irreplaceable resources**	**Consequence**	**Probability**	**Significance**	**Confidence**
Archaeological occurrences	**Unmanaged**	Neutral-Negative	Low	High	Low	High	Low	Low	Medium-High	Low	High
	Managed	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Landscapes	**Unmanaged**	Negative	Medium	High	Medium-High	Medium-High	Medium	Medium-High	Medium-High	Medium-High	Medium-High
	Managed	Neutral	Medium	Low	Low	Low	Low	Low	Low	Low	High
Graves	**Unmanaged**	Negative	Low	High	High	High	High	High	High	High	High
	Managed	Neutral	Low	High	Low	Low	Low	Low	Low	Low	High

4.3.2 Construction Phase Impacts and Mitigation Measures

Route alternatives 1, 2 and 3

(a) Archaeological occurrences

Description

Isolated stone artefacts could be displaced or destroyed by construction activities.

Mitigation Measures

- Since the stone artefacts comprise occurrences rather than sites, are located outside of their primary context and are common throughout the region, they have low heritage significance. No mitigation measures are required.

(b) Landscapes

Description

Oviston Nature Reserve is a formally protected landscape that is sensitive to indirect visual intrusions that could detract from the sense of place of this 'big sky' setting with vistas that continue uninterrupted for many kilometres. Much of the tourism value of this largely agrarian, undeveloped region depends on the maintenance of this landscape.

Mitigation Measures

- Indirect impacts may be avoided by routing infrastructure at least 1km away from Oviston Nature Reserve, and/or placing it within existing infrastructure servitudes, and/or 'behind' natural features such as hills.

Route alternatives 1, 2 and 4

(a) Graves

Description

Graves may be altered or destroyed by the construction of tower platforms and other activity areas. This is a particular risk when graves are unmarked and difficult to identify, as is the case of the labourers' graves occurring within this route alternative on the farm Murrayskop (see location of graves relative to powerline in Plate 4 in Appendix).

Mitigation Measures

- Direct impacts on graves may be avoided by routing tower infrastructure (not the overhead lines) at least 50 metres away from graves in all directions, in compliance with the recommendation of SAHRA's Graves and Burial Grounds' Unit. As Plate 4 illustrates, none of the graves is located less than 100m from a proposed tower location. Accordingly, all the graves should be demarcated by reversible means prior to construction by the Environmental Control Officer in consultation with the landowner, and removed only once overhead lines have been strung and all construction activities have ceased.

- If possible graves should be demarcated as a unit. Metal stanchions of at least 1.2m in height should be hammered (not cemented) into the ground at a distance of at least five metres from the edge of the group of graves, and at least two rows of fencing wire strung between them. Red and white barrier tape should be threaded between the wires to create a highly visible vertical zigzag or chevron pattern. If project managers are concerned that the fencing materials will be stolen while still in use, they should consult a heritage practitioner to devise an alternative.
- Overhead lines crossing graves have no direct impacts on graves and require no mitigation, unless the servitude will be managed. If the servitude is to be managed through vegetation clearance, for example, the line must either be rerouted at least 50 metres away from the graves, or the graves must be demarcated permanently. Such demarcation applies to the southernmost labour tenant's grave(s) (see Plate 4 in Appendix) and must comply with the recommendations of SAHRA and a heritage practitioner, but minimally adhere to the following guidelines:

    - All graves must be fenced (preferably as a single unit) using metal corner and straining posts and fencing wire, to a minimum height of 1.2 metres.
    - The fence must be located at a minimum distance of 3-5 metres from the nearest grave and have an access gate.
    - No further construction or maintenance activities may occur within a minimum distance of 10 metres from the edge of the fence, with the exception of periodic vegetation clearance.

Route alternative 4

(a) Archaeological occurrences

Description

Isolated stone artefacts could be displaced or destroyed by construction activities.

Mitigation Measures

- Since the stone artefacts comprise occurrences rather than sites, are located outside of their primary context and are common throughout the region, they have low heritage significance. No mitigation measures are required.

(b) Landscapes

Description

Oviston Nature Reserve is a formally protected landscape that is sensitive to indirect visual intrusions that could detract from the sense of place of this 'big sky' setting with vistas that continue uninterrupted for many kilometres. Much of the tourism value of this largely agrarian, undeveloped region depends on the maintenance of this landscape.

Mitigation Measures

Indirect impacts may be avoided by routing infrastructure at least 1km away from Oviston Nature Reserve, and/or placing it within existing infrastructure servitudes, and/or 'behind' natural features such as hills. **This mitigation measure has already**

been implemented for Route alternative 4. Since Route 4 is deviated away from the Oviston Nature reserve while Route 1 crosses the nature reserve for approximately 10km, the impact of route 4 is lower than route 1.

4.3.3 Operational Phase

No mitigation required, unless new infrastructure is introduced.

4.3.4 Operational Phase Impacts and Mitigation Measures

Not applicable

4.3.5 Decommissioning Phase

No mitigation required, unless new infrastructure is introduced.

4.3.6 Decommissioning Phase Impacts and Mitigation Measures

Not applicable.

4.4 Impact Assessment - Alternatives

4.4.1 No Go Option

If further work on Route alternative 4 is ceased, without decommissioning of the line, the remaining tower infrastructure will continue to have an impact on the landscape. However, this impact will be low (as summarised in Table 10), since the towers have already been routed to minimise impacts on existing landscapes. No mitigation of impacts on the graves on Murrayskop farm will be necessary.

4.4.2 Alternative Powerline Routing

The impacts on heritage resources of Route alternatives 1 and 2 are essentially identical, affecting archaeological occurrences and the western and southern borders of the Oviston Nature Reserve landscape. Mitigation measures are not required for archaeological occurrences, while management of impacts on the landscape reduces the significance of such impacts to LOW. The impact of Route alternative 3 is even less, affecting archaeological occurrences and only the western border of the reserve, with the same mitigation options, but with potential effects on the landscape occurring over a much shorter distance.

However, abandoning Route alternative 4 in preference to any of the three other route alternatives is not advisable, for the following reasons:

- Leaving the existing though unstrung towers already erected for Route 4 will have an impact, albeit low, on the visual landscape that cannot be justified, since the line will not be operational.

- Removing the towers already erected for Route 4, and constructing Route alternative 3 cannot be justified, since the main impact of Route 4 (visual disturbance of the Oviston Nature Reserve landscape) has been minimised by judicious tower placement.

5 MONITORING PROGRAMME

Route alternatives 1, 2 and 3

- No monitoring required.

Route alternative 4

- The Environmental Control Officer should demarcate the graves identified on the farm Murrayskop in consultation with the landowner, either temporarily or permanently as appropriate (see Section 4.3.2) prior to the start of any construction activities in the area.

6 CONCLUSION

The impacts on heritage resources of Route alternatives 1 and 2 are essentially identical, affecting archaeological occurrences and the western and southern borders of the Oviston Nature Reserve landscape. Mitigation measures are not required for archaeological occurrences, while management of impacts on the landscape reduces the significance of such impacts to LOW. The impact of Route alternative 3 is even less, affecting archaeological occurrences and only the western border of the reserve, with the same mitigation options, but with potential effects on the landscape occurring over a much shorter distance.

However, abandoning Route alternative 4 in preference to any of the three other route alternatives is not advisable, for the following reasons:

- Leaving the existing though unstrung towers already erected for Route 4 will have an impact, albeit low, on the visual landscape that cannot be justified, since the line will not be operational.
- Removing the towers already erected for Route 4, and constructing Route alternative 3 cannot be justified, since the main impact of Route 4 (visual disturbance of the Oviston Nature Reserve landscape) has been minimised by judicious tower placement.

Heritage resources potentially affected by Route alternative 4 are limited to archaeological occurrences occurring throughout the area; the landscape of Oviston Nature Reserve along its western and southern boundaries; and graves located outside of a formal cemetery on the farm Murrayskop.

The low significance and abundance of archaeological occurrences does not warrant any mitigation, while impacts on landscapes have already been minimised and impacts on graves may be achieved through avoidance.

Accordingly, we recommend that Eskom complete the construction of Route alternative 4, with the heritage mitigation proposed in this report and have submitted this report to SAHRA in fulfilment of the requirements of the NHRA.

If permission is granted for development to proceed, the client is reminded that the NHRA requires that a developer cease all work immediately and contact SAHRA should any heritage resources, as defined in the Act, be discovered during the course of development activities.

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Appendix: Photographs

Plate 1: Examples of stone artefacts in study area.

Plate 2: Grave of father of Mr Jan Harms van Wyk.

Plate 3: Unmarked labour tenants' graves on farm Murrayskop.

Plate 4: Location of graves on farm Murrayskop adjacent to powerline servitude.