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A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR THE PROPOSED KIPOWER 400KV LOOP-IN AND LOOP-OUT TRANSMISSION LINES TO CONNECT THE KIPOWER INDEPENDENT POWER STATION WITH THE NATIONAL GRID ON THE EASTERN HIGHVELD IN THE MPUMALANGA PROVINCE

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January 2016

EXECUTIVE SUMMARY

This document contains the report on a Phase I Heritage Impact Assessment (HIA) study which was done according to Section 38 of the National Heritage Resources Act (No 25 of 1999) for the proposed 2x400kV loop-in and loop-out transmission lines between the KiPower Independent Power Producer (IPP) Power Plant and the Matla-Glockner 400kV power lines between Delmas and Leandra on the eastern Highveld in the Mpumalanga Province of South Africa.

The Phase I HIA for the proposed project area revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in and near the project area, namely:

- Historical remains consisting of farmsteads with outbuildings and other remains which are older than sixty years; and
- Graveyards and graves.

The historical remains, graveyards and graves were geo-referenced and mapped (Figure 7, Tables 1 & 2). The significance of these heritage resources is indicated as well as possible impacts and the significance of possible impacts on some of these heritage resources were determined (Tables 4 & 5). Mitigation or precautionary measures are outlined for those heritage resources which occur near the proposed power line servitudes.

The significance of the heritage resources

The KiPower power line project may impact on some of the heritage resources. The significance of the heritage resources therefore has to be determined as well as the significance of any impact on the heritage resources. Mitigation measures are proposed for those heritage resources which may be affected by the KiPower power line project.

The significance of the heritage resources and the significance of the impact on the heritage resources were determined according to the types and ranges (categories) of heritage resources which were identified and criteria such as the aesthetical, research, educational and other value systems for the heritage resources in order to ensure that all types and ranges of heritage resources receive optimal mitigation measures.

The significance of possible impacts on the heritage resources was determined using a ranking scale based on various criteria.

The significance of the historical remains

Two categories of historical remains were identified, namely farmstead complexes (FC01, FC02) and a site with stone structures or walls (SS01) (Table 1). These remains comprise historical settlements which are older than sixty years which are protected by the National Heritage Resources Act (No 25 of 1999).

The significance of both these categories of historical remains can be rated as medium when considering criteria such as the following (Table 1):

- Both categories of historical remains can contribute to a better understanding of the lifeways of early inhabitants on the eastern Highveld in Mpumalanga.
- Both categories of historical remains are under threat due to an established agro-economic industry and an expanding coal mining complex on the eastern Highveld of Mpumalanga.
- Both categories of historical remains provide opportunities to be utilised in tourism, education and research particularly if further studied, renovated and applications to be utilised (e.g. in the tourism or leisure industry) can be implemented.

The significance of the graveyards and graves

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the NHRA (Act No 25 of 1999) in instances where graves are older than sixty years. It is highly likely that all the graves and graveyards in the project area are older than sixty years and if some of the graves are not this age they are approaching this time range as is laid down by the NHRA (Act No 25 of 1999). Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended).

Possible impact on the heritage resources

The different options for the proposed KiPower power line corridors indicate that a Farmstead Complex and several graveyards occur within the ambits of the one kilometre power line corridors and may be within or close to the 110m power line servitudes once the final power line location has been determined. These heritage resources are listed in Table 3 (Also refer to Figure 7). Not

all of these heritage resources will be directly (physically) affected by the KiPower power lines if the final power line location is selected to avoid the heritage resources.

Possible impacts on the historical remains

Individual structures within FC01 may be impacted by the KiPower power lines as they occur within the one kilometre power line corridor. However, if the final power line alignment may be selected to avoid the historical resources these resources may be avoided by the power lines and the pylons on which they hung (Tables 3, 4 & Figure 7).

The significance of the impacts on FC01 therefore is low (Table 4).

Possible impacts on the graveyards and graves

None of the graveyards and graves needs to be impacted by the power line servitude particularly if the final power line alignment with its associated pylons and power lines does avoid the graveyards (Tables 3, 5 & Figure 7).

The significance of any possible impact on any of the graveyards in the power line corridor therefore is low. This also applies when mitigation or precautionary measures are implemented (Table 5).

Mitigating and managing the impacts on heritage resources

The following mitigation and management measures are outlined for those heritage resources which may be affected by the KiPower power lines, namely:

Mitigating the impacts on the historical remains

Mitigation measures are needed if Farmstead Complex (FC01) is affected by the final chosen option for the KiPower power lines. Although the complex of structures is beyond repair FC01 has to be studied and documented by a historical architect before any of these remains may be affected in any way, e.g. to be altered or to be demolished as a result of the implementation of the KiPower line project. The SAHRA will require that the historical structures to be affected (and the complex as such) have be studied and documented by the conservation architect before the SAHRA will make any recommendations regarding the future existence of these remains.

The significance of any possible impact on FC01 after the mitigation measures have been put in place will be low (Table 4).

Mitigating the impact on the graveyards

Cautionary measures should be taken not to disturb any of the graveyards in the power line corridors during the construction phase of the project. This can include the demarcation of graveyards in close proximity of the power line servitudes with red cautionary tape and 'Do not Disturb' signposts in order to avoid the graveyards being damaged by construction personnel or their vehicles. No guidelines exist for safe distances between power lines and graveyards.

The significance of any possible impact on any graveyards after precautionary measures have been put in place will be low (Table 5).

Assumptions and limitations

It is possible that this Phase I HIA study may have missed heritage resources in the project area as heritage sites may occur in maize fields or in tall grass or thick clumps of vegetation while others may be located below the surface of the earth and may only be exposed once development commences.

If any heritage resources of significance are exposed during the construction, operation or decommissioning of the power lines the SAHRA should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologists (ASAPA) should be notified in order to determine appropriate mitigation measures for impacts to the discovered finds. This may include obtaining the necessary authorisation (permits) from the SAHRA to conduct the mitigation measures.

Summary

From a heritage perspective it appears as if Option A, B and C are the most suitable for the construction of the Kipower power lines. Option D is the least preferred option considering the presence of historical remains (FC01) and a number of graveyards within the 1km corridor. However it should be noted that the exact wide servitude, within the 1 km corridor has not yet be identified and should the exact route deviate away from FC01, heritage impacts on all corridor alternatives will be ranked equally.

1 INTRODUCTION

This document contains the results of the Phase I Heritage Impact Assessment (HIA) study that was done for KiPower (Pty) Ltd's proposed loop-in and loop-out 400 kV transmission lines to connect the KiPower Independent Power Producer (IPP) power plant to the national grid in the Mpumalanga Province of South Africa.

Focused archaeological research has been conducted in the Mpumalanga Province for several decades. This research consists of surveys and excavations of Stone Age and Iron Age sites as well as the recording of rock art and historical sites in this area. The Mpumalanga Province has a rich heritage comprising of remains dating from the pre-historical and from the historical (or colonial) periods of South Africa. Pre-historical and historical remains in the Mpumalanga Province form a record of the heritage of most groups living in South Africa today.

Heritage resources in the Mpumalanga Province therefore constitute a rich and wide diversified range (comprising the 'national estate') as outlined in Section 3 of the National Heritage Resources Act (Act 25 of 1999) (see Box 1, next page).

Box 1: Types and ranges of heritage resources (the 'national estate') as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999)

The National Heritage Resources Act (No 25 of 1999) outlines the following types and ranges of heritage resources that qualify as part of the national estate, namely:

(a) places, buildings structures and equipment of cultural significance;
(b) places to which oral traditions are attached or which are associated with living heritage;
(c) historical settlements and townscapes;
(d) landscapes and natural features of cultural significance;
(e) geological sites of scientific or cultural importance;
(f) archaeological and paleontological sites;
(g) graves and burial grounds including-
  (i) ancestral graves;
  (ii) royal graves and graves of traditional leaders
  (iii) graves of victims of conflict
  (iv) graves of individuals designated by the Minister by notice in the Gazette;
  (v) historical graves and cemeteries; and
  (vi) other human remains which are not covered by in terms of the Human Tissue Act, 1983 (Act No 65 of 1983)
(h) sites of significance relating to the history of slavery in South Africa;
(i) moveable objects, including -
  (i) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites and rare geological specimens;
  (ii) objects to which oral traditions are attached or which are associated with living heritage;
  (iii) ethnographic art and objects;
  (iv) military objects;
  (v) objects of decorative or fine art;
  (vi) objects of scientific or technological interest; and
  (vii) books, records, documents, photographs, 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).

The National Heritage Resources Act (Act No 25 of 1999, Sec 3) also distinguishes nine criteria for places and objects to qualify as 'part of the national estate if they have cultural significance or other special value …'. These criteria are the following:

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

2 DETAILS OF THE SPECIALIST

Profession: Archaeologist, Museologist (Museum Scientists), Lecturer, Heritage Guide Trainer and Heritage Consultant

Qualifications:

BA (Archaeology, Anthropology and Psychology) (UP, 1976)

BA (Hons) Archaeology (distinction) (UP, 1979)

MA Archaeology (distinction) (UP, 1985)

D Phil Archaeology (UP, 1989)

Post Graduate Diploma in Museology (Museum Sciences) (UP, 1981)

Work experience:

Museum curator and archaeologist for the Rustenburg and Phalaborwa Town Councils (1980-1984)

Head of the Department of Archaeology, National Cultural History Museum in Pretoria (1988-1989)

Lecturer and Senior lecturer Department of Anthropology and Archaeology, University of Pretoria (1990-2003)

Independent Archaeologist and Heritage Consultant (2003-)

Accreditation: Member of the Association for Southern African Professional Archaeologists. (ASAPA)

Summary: Julius Pistorius is a qualified archaeologist and heritage specialist with extensive experience as a university lecturer, museum scientist, researcher and heritage consultant. His research focussed on the Late Iron Age Tswana and Lowveld-Sotho (particularly the Bamalatji of Phalaborwa). He has published a book on early Tswana settlement in the North-West Province and has completed an unpublished manuscript on the rise of Bamalatji metal workings spheres in Phalaborwa during the last 1 200 years. He has written a guide for Eskom's field personnel on heritage management. He has published twenty scientific papers in academic journals and several popular articles on archaeology and heritage matters. He collaborated with environmental companies in compiling State of the Environmental Reports for Ekurhuleni, Hartebeespoort and heritage management plans for the Magaliesberg and Waterberg. Since acting as an independent consultant he has done approximately 800 large to small heritage impact assessment reports. He has a longstanding working relationship with Eskom, Rio Tinto (PMC), Rio Tinto (EXP), Impala Platinum, Angloplats (Rustenburg), Lonmin, Sasol, PMC, Foskor, Kudu and Kelgran Granite, Bafokeng Royal Resources, Pilanesberg Platinum Mine etc. as well as with several environmental companies.

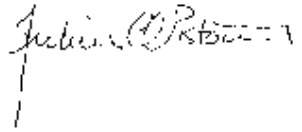
3 DECLARATION OF INDEPENDENCE

I, **Julius CC Pistorius**, declare that:

•I act as the independent environmental practitioner in this application
•I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
•I declare that there are no circumstances that may compromise my objectivity in performing such work;
•I have expertise in conducting environmental impact assessments, including knowledge of the National Heritage Resources Act (No 25 of 1999) and any guidelines that have relevance to the proposed activity;
•I will comply with the Act, regulations and all other applicable legislation;
•I will take into account, to the extent possible, the matters listed in regulation **8** of the regulations when preparing the application and any report relating to the application;
•I have no, and will not engage in, conflicting interests in the undertaking of the activity;
•I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
•I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
•I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
•I will keep a register of all interested and affected parties that participated in a public participation process; and
•I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
•all the particulars furnished by me in this form are true and correct;
•will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
•I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010.



Signature of the environmental practitioner:

Private Consultant

Name of company:

15 January 2016

Date:

4 LEGAL FRAMEWORK

South Africa's heritage resources ('national estate') are protected by international, national and regional legislation which provides regulations, policies and guidelines for the protection, management, promotion and utilisation of heritage resources.

According to the NHRA (Act No 25 of 1999) heritage resources are categorised using a three-tier system, namely Grade I (national), Grade II (provincial) and Grade III (local) heritage resources.

At the provincial level, heritage legislation is implemented by Provincial Heritage Resources Agencies (PHRAs) which apply the NHRA (Act 25 of 1999) together with provincial government guidelines and strategic frameworks. Metropolitan or Municipal (local) policy regarding the protection of cultural heritage resources is also linked to national acts and is implemented by the SAHRA and the PHRAs.

At a national level heritage resources are dealt with by the National Heritage Council Act (Act No 11 of 1999) and the NHRA (Act No 25 of 1999).

4.1 Legislation relevant to heritage resources

The identification, evaluation and assessment of heritage resources in South Africa is regulated by the following legislation:

- National Environmental Management Act (NEMA) Act 107 of 1998
- NHRA Act 25 of 1999
- Mineral and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
- Development Facilitation Act (DFA) Act 67 of 1995

4.2 The National Heritage Resources Act (NHRA)

According to the NHRA (Act No 25 of 1999) the 'national estate' comprises of everything mentioned in Box 1 above.

4.3 Heritage Impact Assessment studies

According to Section 38 of the NHRA a Heritage Impact Assessment (HIA) process must be followed under the following circumstances:

- The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- The construction of a bridge or similar structure exceeding 50m in length
- Any development or activity that will change the character of a site and which exceeds 5 000m^2 or which involve three or more existing erven or subdivisions thereof
- Re-zoning of a site exceeding 10 000 m^2
- Any other category provided for in the regulations of SAHRA or a PHRA.

4.4 Regulations with regard to heritage resources

The regulations outlined below are applicable to the types and ranges of heritage resources which are the most common in the region where the heritage study was conducted, namely:

4.4.1 Buildings and structures

According to Section 34(1) of the NHRA (Act No 25 of 1999) no person may alter (demolish) any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or any other facility made by people and which is fixed to land and which includes fixtures, fittings and equipment associated with such structures.

Alter means any action which affects the structure, appearance or physical properties of a place or object, whether by way of structural or any other works such as painting, plastering, decorating, etc..

4.4.2 Graves and burial grounds

Graves and burial grounds are divided into the following:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries
f. human remains

In terms of Section 36(3) of the NHRA (Act No 25 of 1999) no person, without a permit issued by the relevant heritage resources authority, may:

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 or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Unidentified graves are handled as if they are older than 60 years until proven otherwise.

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the Ordinance on Excavations (Ordinance no. 12 of 1980) (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place. Human remains can only be handled by a

registered undertaker or an institution declared under the Human Tissues Act (Act 65 of 1983 as amended).

4.4.3 Archaeology, palaeontology and meteorites

Section 35(4) of the NHRA (Act No 25 of 1999) deals with archaeology, palaeontology and meteorites and states that no person without a permit issued by the responsible heritage resources authority (national or provincial) may:

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological material or object or any meteorite
- trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or paleontological material or object, or any meteorite; or bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and paleontological material or objects, or use such equipment for the recovery of meteorites
- alter or demolish any structure or part of a structure which is older than 60 years.

Heritage resources may only be disturbed or moved by an archaeologist after being issued with a permit received from the SAHRA. In order to demolish heritage resources the developer has to acquire a destruction permit by from SAHRA.

5 TERMS OF REFERENCE

KiPower (Pty) Ltd (KiPower) is a subsidiary of Kuyasa Mining which also owns Delmas Coal and iKhwezi Colliery which are located south-east of Delmas in the Mpumalanga Province. KiPower intends to connect the KiPower IPP Power Plant with the national grid by means of establishing two 400 kV loop-in and loop-out power lines between the KiPower IPP Power Plant and the Matla-Glockner 400kV power lines. These power lines will traverse across a part of the eastern Highveld which is situated between Delmas and Leandra in the Mpumalanga Province.

Activities relating to the construction, operation and eventual decommissioning of the power lines may have an influence on any of the types and ranges of heritage resources as outlined in Section 3 of the NHRA. Consequently, Jones & Wagener (Pty) Ltd, the environmental consultant who is responsible for compiling the Scoping and Environmental Impact Reports (EIR) in terms of the National Environmental Management Act (Act 107 of 1998) for the new development, commissioned the author to undertake a Phase I HIA study for the proposed new power lines.

The aims of the Phase I HIA study were the following:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 3 of the NHRA (see Box 1) do occur in the project area and, if so, to determine the nature, the extent and the significance of these remains.
- To establish if any of these heritage resources will be affected by the proposed power lines and, if so, to evaluate what appropriate mitigation measures must be taken if any of the types and ranges of heritage resources will be affected by the proposed power lines.

6 APPROACH AND METHODOLOGY

This Phase I HIA study was conducted by means of the following:

6.1 Field survey

Field surveys were conducted during 5 to 8 January 2016 and on 11 and 12 January 2016. The field survey for the proposed new power lines was conducted by means of following provincial and district roads as well as two track roads and any other accessible roads and pathways in the project area in order to gain access to the proposed power line corridors. The roads that were followed with a vehicle during the survey were recorded with a mounted GPS instrument. Pedestrian surveys were undertaken from these primary access routes.

Figure 1- GPS track log which was registered for the project area. Pedestrian surveys were conducted from the main pathway which was recorded with a GPS instrument which was mounted in a vehicle (above).

Large parts of the project area are covered with maize fields. These fields were not surveyed except if graveyards, which were known to spokespersons, occurred in these fields.

Google imagery was used as a supplementary source together with the fieldwork to establish the possible presence of heritage resources such as historical farm homesteads with outbuildings.

Ecological indicators such as alterations in vegetation patterns; open or bald spots in the veld covered only with grass or extremely dense patches of vegetation were searched as possible indicators for settlements such as stone walls or as former abodes where farm workers may have settled in the past.

All coordinates for heritage resources were recorded with a Garmin Etrex hand set Global Positioning System (instrument) with an accuracy of < 15m.

The description of the fieldwork survey (Part 9.1) further illuminates the nature and character of the project area by means of descriptions and photographs.

6.2 Databases, literature survey and maps

Databases kept and maintained at institutions such as the PHRA, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and SAHRA's national archive (SAHRIS) were consulted to determine whether any heritage resources of significance had been identified during earlier heritage surveys in or near the project area.

The author is acquainted with the project area at large as he has done several heritage impact assessment studies near the proposed project area. These studies provided information regarding the nature and heritage character of the area, namely (see 'Part 9, Bibliography relating to earlier heritage studies'):

- Pistorius, J.C.C. 2008. A Phase I Heritage Impact Assessment (HIA) study for Keaton Mining's (Pty) Ltd proposed new opencast and underground mining

activities on the farm Vanggatfontein 251 east of Delmas on the Eastern Highveld in the Mpumalanga Province of South Africa. Unpublished report prepared for Metago Environmental Engineers.

- Pistorius, J.C.C. 2008. A Phase I Heritage Impact Assessment (HIA) study for Keaton Mining's (Pty) Ltd proposed new coal loading and storage facility at the existing hawerklip railway station on portion 21 of the farm Matjiesgoedkuil 266IR near Delmas on the Eastern Highveld in the Mpumalanga Province of South Africa. Unpublished report prepared for Metago Environmental Engineers.
- De Jongh, R. 2010. Specialist study: Heritage scoping (basic assessment) report: Input into EIR, IWWMP and IWULA for the proposed Kuyasa IPP power generation on portions of the farms Haverglen 269IR and Haverklip 265IR near Delmas, Mpumalanga Province. Unpublished report prepared by Cultmatrix.
- Pistorius, J.C.C. 2012. A Phase I Heritage Impact Assessment study for a proposed 600MM power plant and associated infrastructure for KiPower (Pty) Ltd near Delmas on the Eastern Highveld in the Mpumalanga Province. Unpublished report prepared for Jones & Wagener.
- Pistorius, J.C.C. 2012. A Phase I Heritage Impact Assessment study for a proposed raw water supply pipeline for KiPower (Pty) Ltd near Delmas on the Eastern Highveld in the Mpumalanga Province. Unpublished report prepared for Jones & Wagener.
- Pistorius, J.C.C. 2013. An updated Phase I Heritage Impact Assessment study for a proposed raw water supply pipeline for KiPower (Pty) Ltd near Delmas on the Eastern Highveld in the Mpumalanga Province. Unpublished report prepared for Jones & Wagener.

Literature relating to the pre-historical and the historical unfolding of the region where the Project Area is located was reviewed (see Part 8, 'Contextualising the Project Area' and Part 10 'Select Bibliography). The pre-historical and historical context of the larger area assisted with assumptions about the possible types and ranges of heritage resources to be expected in the project area as well as to comprehend the identity and meaning of heritage sites which may be found in and near the project area.

In addition, the project area was studied by means of maps (2628BD Leandra & 2628BB Kendal 1: 50 000 topographical map & 2628 East Rand 1: 250 000 map).

6.3 Assumptions and limitations

It is possible that this Phase I HIA study may have missed heritage resources in the project area as heritage sites may occur in maize fields or in tall grass or thick clumps of vegetation while others may be located below the surface of the earth and may only be exposed once development commences.

If any heritage resources of significance are exposed during the construction, operation or decommissioning of the power lines the SAHRA should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notified in order to determine appropriate mitigation measures for impacts to the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

6.4 Some remarks on terminology

Terms that may be used in this report are briefly outlined below:

- Conservation: The act of maintaining all or part of a resource (whether renewable or non-renewable) in its present condition in order to provide for its continued or future use. Conservation includes sustainable use, protection, maintenance, rehabilitation, restoration and enhancement of the natural and cultural environment.

- Cultural resource management: A process that consists of a range of interventions and provides a framework for informed and value-based decision-making. It integrates professional, technical and administrative functions and interventions that impact on cultural resources. Activities include planning, policy development, monitoring and assessment, auditing, implementation,

maintenance, communication, and many others. All these activities are (or will be) based on sound research.

- Cultural resources: A broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practice, belief or social interaction. They can be, but are not necessarily identified with defined locations.

- Heritage resources: The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources. Heritage resources (cultural resources) include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

- In-Situ Conservation: The conservation and maintenance of ecosystems, natural habitats and cultural resources in their natural and original surroundings.

- Iron Age: Refers to the last two millennia and 'Early Iron Age' to the first thousand years AD. 'Late Iron Age' refers to the period between the 16th century and the 19th century and can therefore include the Historical Period.

- Maintenance: Keeping something in good health or repair.

- Pre-historical: Refers to the time before any historical documents were written or any written language developed in a particular area or region of the world. The historical period and historical remains refer, for the Project Area, to the first appearance or use of 'modern' Western writing brought to the Eastern Highveld by the first Colonists who settled here from the 1840's onwards.

- Preservation: Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource.

- Recent past: Refers to the 20th century. Remains from this period are not necessarily older than sixty years and therefore may not qualify as archaeological or historical remains. Some of these remains, however, may be close to sixty years of age and may, in the near future, qualify as heritage resources.

- Protected area: A geographically defined area designated and managed to achieve specific conservation objectives. Protected areas are dedicated primarily to the protection and enjoyment of natural or cultural heritage, to the maintenance of biodiversity, and to the maintenance of life-support systems. Various types of protected areas occur in South Africa.

- Reconstruction: Re-erecting a structure on its original site using original components.

- Replication: The act or process of reproducing by new construction the exact form and detail of a vanished building, structure, object, or a part thereof, as it appeared at a specific period.

- Restoration: Returning the existing fabric of a place to a known earlier state by removing additions or by reassembling existing components.

- Stone Age: Refers to the prehistoric past, although Late Stone Age people lived in South Africa well into the Historical Period. The Stone Age is divided into an Earlier Stone Age (3 million years to 150 000 thousand years ago) the Middle Stone Age (150 000 years to 40 000 years ago) and the Late Stone Age (40 000 years to 200 years ago).

- Sustainability: The ability of an activity to continue indefinitely, at current and projected levels, without depleting social, financial, physical and other resources required to produce the expected benefits.

- Translocation: Dismantling a structure and re-erecting it on a new site using original components.

- Project Area: refers to the area (footprint) where the developer wants to focus its development activities (refer to Figure 7).

- Phase I studies refer to surveys using various sources of data in order to establish the presence of all possible types and ranges of heritage resources in any given Project Area (excluding paleontological remains as these studies are done by registered and accredited palaeontologists).

- Phase II studies include in-depth cultural heritage studies such as archaeological mapping, excavating and sometimes laboratory work. Phase II work may include the documenting of rock art, engraving or historical sites and dwellings; the sampling of archaeological sites or shipwrecks; extended excavations of archaeological sites; the exhumation of human remains and the relocation of graveyards, etc. Phase II work involves permitting processes, requires the input of different specialists and the co-operation and approval of the SAHRA.

7 THE KIPOWER PROJECT

7.1 The nature of the KiPower power line project

KiPower has recently (21 October 2015) been granted Environmental Authorisation to construct and operate a 600 MW IPP coal-fired power station located approximately 20 km to the south-east of Delmas in the Mpumalanga Province. The proposed IPP Power Plant requires two 400 kV loop-in and loop-out power lines to connect to the national Eskom power grid (2628bd Leandra & 2628BB Kendal 1: 50 000 topographical maps & 2628 East Rand, 1:250 000 map) (Figures 1, 2 & 7).

Eskom advised KiPower that the only feasible power line available to connect the power plant to the national grid is the Matla-Glockner 400 kV power line, located approximately 24 km to the south east of the approved power plant. Therefore, in order to connect the proposed power plant to the grid, the loop-in and loop-out 400 kV power lines have to be constructed between the approved power plant and the existing Matla-Glockner 400 kV power line. This development requires a Scoping and Environmental Impact Reporting (S&EIR) process in terms of the National Environmental Management Act (Act 107 of 1998) as amended.

A 400 kV transmission line comprises of a series of pylons (towers) with an average height of 40 meters and a 55 m wide servitude (27.5 m on either side of the centre line). Since there will be two power lines, a 110 m wide servitude will be required. Four alternatives, each approximately 1 km wide and a wider study area are being investigated. A 1 km wide corridor is assessed although only a 110 m wide servitude is required because once an alternative has been approved by the DEA slight deviations within the 1 km corridor may be required based on landowner negotiations and/or environmental, social or economic sensitivities that are identified during the process.

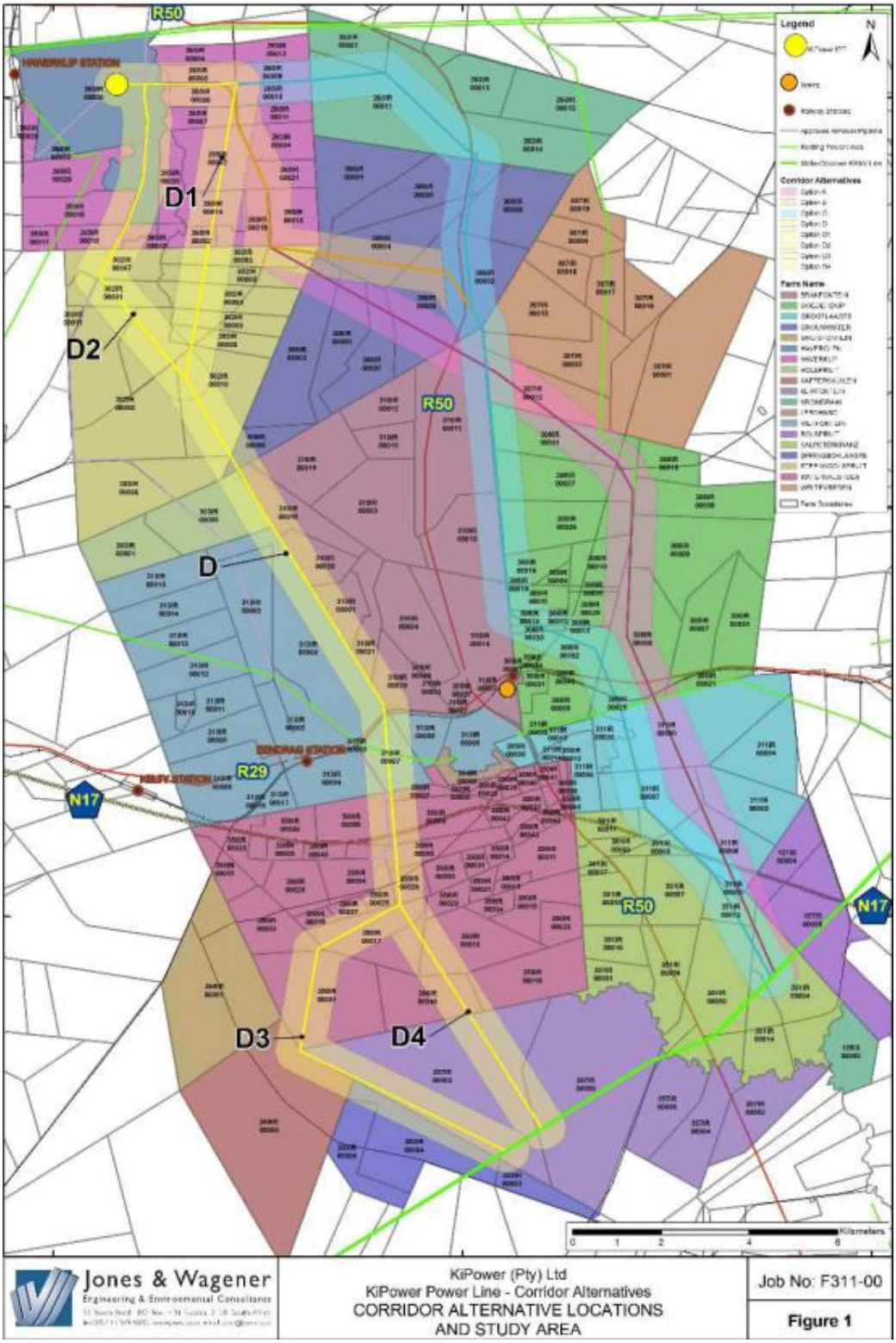


Figure 2- Study area for KiPower power lines on the eastern Highveld between Leandra and Delmas in the Mpumalanga Province (above).

A Corridor Selection/Screening Report has been compiled. With Eskom's inputs the selection of corridors took cognisance of a number of criteria. The bulk of this information is contained in the Draft Scoping Report. Alternatives were screened prior to this scoping phase of the EIA process to determine if they are environmentally feasible, to identify any high level fatal flaws and to propose other alternatives if applicable. The alternatives are being assessed by specialists and will be presented to the public for comment before the decision making authority, the DEA, will study the findings of the EIR and make a decision on whether to grant or refuse authorisation for the preferred alternative that will have the least impact on the environment.

Several options were investigated during the development of the corridor selection report and four alternatives within a broad study area will be investigated in detail during this EIA process. These alternatives are as follows (Figure 2):

Corridor A

Corridor A exits the High-Voltage (HV) switchyard located on the eastern side of the KiPower IPP power plant and traverses the southern boundary of the proposed power plant Ash Disposal Facility (ADF) (~2 km). The corridor then follows a gravel road south for approximately 4 km before heading across the study area in a south-easterly direction (8.5 km). Before this corridor reaches the Kendal-Tutuka 400 kV power line, it turns southwards, following the existing line across the R29 road, a railway line, a distribution line and the N17 road before joining the Matla-Glockner 400 kV line after 12 km. The total length of this alternative is 27.24 km.

Corridor B

Corridor B exits the HV switchyard located on the eastern side of the KiPower IPP power plant and traverses along the southern boundary of the ADF (~2 km). The corridor then follows a gravel road south for approximately 4 km, after which the corridor turns east and crosses the R50 road (~5 km). Where the R50 curves towards
Leandra, the corridor bears due south, skirting the town on the east, heading south-westwards and then south-eastwards (following farm portion boundaries where possible) across the R29 road, a railway line, a distribution line and the N17 road before joining

the Matla-Glockner 400 kV line after 12 km. The total length of this alternative is 27.77 km.

Corridor C

Corridor C exits the HV switchyard located on the eastern side of the KiPower IPP power plant and traverses along the southern boundary of the ADF (~2 km). The corridor then continues east until it reaches a grove of trees (~3 km), approximately 1 km before the R50 road. At this grove of trees, Corridor C turns to the south and runs in a south-south-easterly direction, joining up with the R50 after approximately 3 km. The corridor follows the R50 (~3.5 km) and where the R50 curves towards Leandra, the corridor bears due south, skirting the town on the east, heading south-west and then south east (following farm portion boundaries where possible) across the R29 road, a railway line, a small distribution line and the N17 road before joining the Matla-Glockner 400kV line after 12 km. The total length of this alternative is 28.74 km.

Corridor D

Corridor D comprises of four deviation segment options. The corridor will either follow segment D1 or D2 and thereafter follow corridor D in a southerly direction between Eendracht and Leslie. Once south of the N17 road crossing, the corridor will either follow segment D3 or D4 where it connects with the Matla-Glockner 400 kV line. Hence the naming of the corridors ‘Corridor D with D1 and D3”, “Corridor D with D1 and D4”; Corridor D with D2 and D3” and “Corridor D with D2 And D4”. Each Corridor D combination is described below:

Corridor D with D1 and D3

Corridor D with D1 and D3 exits the HV switchyard located on the eastern side of the KiPower IPP power plant and traverses along the southern boundary of the ADF (~2 km) until it reaches a gravel road. At the gravel road, the corridor turns south south-east for approximately 6 km where it crosses a gravel road and then continues for another 600 m before the corridor changes direction, to travel south south-west for approximately 8 km. The corridor travels south-easterly between Eendracht and Leslie, crossing the R29 road, a railway line, the N17 road and a dirt/farm road, for approximately 4.5 km. The corridor continues south west for 2 km followed by south south-west for approximately 2 km over farmlands. The corridor then bears south east for approximately 4.5 km before joining the Matla-Glockner 400 kV line. The total length of this alternative is 31.03 km.

Corridor D with D1 and D4

Corridor D with D1 and D4 exits the HV switchyard located on the eastern side of the KiPower IPP power plant and traverses along the southern boundary of the ADF (~2 km) until it reaches a gravel road. At the gravel road, the corridor turns south south-east for approximately 6 km where it crosses a gravel road and then continues for another 600 m before the corridor changes direction, to travel south south-west for approximately 8 km. The corridor travels south-easterly between Eendracht and Leslie, crossing the R29 road, a railway line, the N17 road and a dirt/farm road, for approximately 4.5 km. The corridor bears south east for approximately 6 km before joining the Malta-Glockner 400 kV line. The total length of this alternative is 27.82 km.

Corridor D with D2 and D3 Corridor D with D2 and D3

This corridor exits the HV switch yard located on the eastern side of the KiPower IPP power plant. The corridor follows the D1059 district road south for approximately 5 km. The corridor leaves the road and crosses over farmlands for 11 km in a south easterly direction. The corridor travels south-easterly between Eendracht and Leslie, crossing the R29 road, a railway line, the N17 road and a dirt/farm road, for approximately 4.5 km. The corridor continues south-west for 2 km followed by south south-west for approximately 2 km over farmlands. The corridor then bears south east for approximately 4.5 km before joining the Matla-Glockner 400 kV line. The total length of this alternative is 29.85 km.

Corridor D with D2 and D4

Corridor D with D2 and D4 exits the HV switch yard located on the eastern side of the KiPower IPP power plant. The corridor follows the D1059 district road south for approximately 5 km. The corridor leaves the road and crosses over farmlands for 11 km in a south easterly direction. The corridor travels south easterly between Eendracht and Leslie, crossing the R29 road, a railway line, the N17 road and a dirt/farm road, for approximately 4.5 km. The corridor bears south east for approximately 6 km before joining the Malta-Glockner 400 kV line. The total length of this alternative is 26.63 km.

7.3 The nature of the project area

The proposed new power lines run across the eastern Highveld in the Mpumalanga Province. The project area is characterised by an outstretched and slightly rolling landscape which comprises areas with pristine grass veld, dry-land agricultural fields which cover large surface areas as well as pastures and grazing areas. Farm homesteads with outbuildings, some with historical significance and others which date from the more recent past dotted the landscape whilst the towns of Eendracht and Leslie are located near the southern border of the project area. The R50 and R29 and the N17 and a railway line bisect the project area, the first two linear developments from the north to the south and the latter two from the west to the east (Figure 3).

This part of the eastern Highveld is characterised by heritage resources which date from the pre-historical into the historical (colonial) period. Stone Age sites, including rock paintings, Iron Age sites and colonial remains therefore do occur across the eastern Highveld. The archaeological, historical and cultural significance of this part of the project area is briefly outlined in the report (see Part 8, ‘Contextualising the Project Area’).

8 CONTEXTUALISING THE PROJECT AREA

The project area is located in the midst of a cultural landscape that is marked by heritage remains dating from the pre-historical into the historical period (see Part 9 'Select Bibliography'). Heritage resources which are quite common in the larger project area include:

- Historical remains associated with farmstead complexes consisting of houses, associated outbuildings, cattle enclosures and graveyards.
- Abandoned graveyards left by farm workers who moved from farms to urban areas.

However, the following overview of pre-historical, historical and cultural evidence indicates the wide range of heritage resources which do occur across the larger project area.

8.1 Stone Age and rock art sites

Stone Age sites are marked by stone artefacts that are found scattered on the surface of the earth or as parts of deposits in caves and rock shelters. The Stone Age is divided into the Early Stone Age (ESA) (covers the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (MSA) (refers to the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (LSA) (the period from 22 000 years ago to 200 years ago).

Dongas and eroded areas at Maleoskop near Groblersdal are one of only a few places in Mpumalanga where ESA Olduwan and Acheulian artefacts have been recorded. Evidence for the MSA has been excavated at the Bushman Rock Shelter near Ohrigstad. This cave was repeatedly visited over a prolonged period. The oldest layers date back to 40 000 years BP (Before Present) and the youngest to 27 000BP (Esterhuysen & Smith 2007).

LSA occupation of the Mpumalanga Province has also been researched at Bushman Rock Shelter where it dates back 12 000BP to 9 000BP and at Höningnestkrans near Badfontein where a LSA site dates back to 4 870BP to 200BP (Esterhuysen & Smith 2007).

The LSA is also associated with rock paintings and engravings which were done by San hunter-gatherers, Khoi Khoi herders and EIA (Early Iron Age) farmers (Maggs 1983, 2008). Approximately 400 rock art sites are distributed throughout Mpumalanga, notably in the northern and eastern regions at places such as Emalahleni (Witbank) (4), Lydenburg (2), White River and the southern Kruger National Park (76), Nelspruit and the Nsikazi District (250). The Ermelo area holds eight rock paintings (Smith & Zubieta 2007).

The rock art of the Mpumalanga Province can be divided into San rock art which is the most wide spread, herder or Khoe Khoe (Khoi Khoi) paintings (thin scattering from the Limpopo Valley) through the Lydenburg district into the Nelspruit area) and localised late white farmer paintings. Farmer paintings can be divided into Sotho-Tswana finger paintings and Nguni engravings (Only 20 engravings occur at Boomplaats, north-west of Lydenburg). Farmer paintings are more localised than San or herder paintings and were mainly used by the painters for instructional purposes (Smith & Zubieta 2007).

During the LSA and Historical Period, San people called the Batwa lived in sandstones caves and rock shelters near Lake Chrissie in the Ermelo area. The Batwa are descendants of the San, the majority of which intermarried with Bantu-Negroid people such as the Nhlapo from Swazi-descend and Sotho-Tswana clans such as the Pai and Pulana. Significant intermarriages and cultural exchanges occurred between these groups. The Batwa were hunter-gatherers who lived from food which they collected from the veld as well as from the pans and swamps in the area. During times of unrest, such as the *difaqane* in the early nineteenth century, the San would converge on Lake Chrissie for food and sanctuary. The caves, lakes, water pans and swamps provided relative security and camouflage. Here, some of the San lived on the surfaces of the water bodies by establishing platforms with reeds. With the arrival of the first colonists in the nineteenth century many of the local Batwa family groups were employed as

farm labourers. Descendants of the Batwa people still live in the larger Project Area (Schapera 1927; Potgieter 1955; Schoonraad & Schoonraad 1975).

8.2 Iron Age remains

The Iron Age is associated with the first agro-pastoralists or farming communities who lived in semi-permanent villages and who practised metal working during the last two millennia. The Iron Age is usually divided into the Early Iron Age (EIA) (covers the 1st millennium AD) and the Later Iron Age (LIA) (covers the first 880 years of the 2nd millennium AD).

Evidence of the first farming communities in the Mpumalanga Province is derived from a few EIA potsherds which occur in association with the LSA occupation of the Höningnest Shelter near Badfontein. The co-existence of EIA potsherds and LSA stone tools suggest some form of 'symbiotic relationship' between the Stone Age hunter-gatherers who lived in the cave and EIA farmers in the area (also note Batwa and Swazi/Sotho Tswana relationship) (Esterhuysen & Smith 2007).

The Welgelegen Shelter on the banks of the Vaal River near Ermelo also reflects some relationship between EIA farmers who lived in this shelter and hunter-gatherers who manufactured stone tools and who occupied a less favourable overhang nearby during AD1200 (Schoonraad & Beaumont 1971).

EIA sites were also investigated at Sterkspruit near Lydenburg (AD720) and in Nelspruit where the provincial governmental offices were constructed. The most infamous EIA site in South Africa is the Lydenburg head site which provided two occupation dates, namely during AD600 and from AD900 to AD1100. At this site the Lydenburg terracotta heads were brought to light. Doornkop, located south of Lydenburg, dates from AD740 and AD810 (Evers 1981; Whitelaw 1996).

The LIA is well represented in Mpumalanga and stretches from AD1500 well into the nineteenth century and the Historical Period. Several spheres of influence, mostly

associated with stone walled sites, can be distinguished in the region. Some of the historically well-known spheres of influence include the following:

- Early arrivals in the Mpumalanga Province such as Bakone clans who lived between Lydenburg, Badfontein and Machadodorp and Eastern Sotho clans such as the Pai, Pulana and Kutswe who established themselves in the eastern parts of the province (Collett 1979, 1983; Delius 2007; Makhura 2007; Delius & Schoeman 2008).
- Swazi expansion into the Highveld and Lowveld of the Mpumalanga Province occurred during the reign of Sobhuza (AD1815 to 1836/39) and Mswati (AD1845 to 1868) while Shangaan clans entered the province across the Lembombo Mountains in the east during the second half of the nineteenth century (Delius 2007; Makhura 2007.).
- The Bakgatla (Pedi) chiefdom in the Steelpoort Valley rose to prominence under Thulare during the early 1800's and was later ruled by Sekwati and Sekhukune from the village of Tsjate in the Leolo Mountains. The Pedi maintained an extended sphere of influence across the Limpopo and Mpumalanga Provinces during the nineteenth century (Mönnig 1978; Delius 1984).
- The Ndzundza-Ndebele established settlements at the foot of the Bothasberge (Kwa Maza and Esikhunjini) in the 1700's and lived at Erholweni from AD1839 to AD1883 where the Ndzundza-Ndebele's sphere of influence known as KoNomthjarhelo stretched across the Steenkampsberge.
- The Bakopa lived at Maleoskop (1840 to 1864) where they were massacred by the Swazi while the Bantwane live in the greater Groblersdal and Marble Hall areas.
- Corbelled stone huts which are associated with ancestors of the Sotho on Tafelkop near Davel which date from the AD1700's into the nineteenth century (Hoernle 1930).
- Stone walled settlements spread out along the eastern edge of the Groot Dwarsriver Valley served as the early abode for smaller clans such as the Choma and Phetla communities which date from the nineteenth century.

8.3 The Historical Period

Historical towns closest to the project area include Delmas, Leandra, Kinross and Devon.

Delmas was laid out in 1907 on the farm Witklip ('white stone') which was divided into 192 residential stands, 48 smallholdings of 4 ha each and a commonage of 138ha. The farm belonged to Frank Dumat who originated from France where his grandfather had a small farm. He named the town Delmas which is derived from 'mas' which means a small farm in a southern dialect of French. In 1909 the government added another 5 500 ha to Frank Dumat's original rural settlement.

The town of Leandra's name is derived from two townships, Leslie and Eendracht, which are incorporated in this mining village.

Kinross, about 20 km east of Leandra, is the railhead for the township of Leandra and four gold mines in the region, namely Winkelhaak, Leslie, Bracken and Kinross which all opened in the 1950's.

The village was proclaimed in 1915 and named after Kinross in Scotland by the engineers who constructed the railway line between Springs and Breyton. Kinross is near the watershed that separates the rivers flowing towards the Indian Ocean in the east and the rivers flowing towards the Atlantic Ocean in the west.

Devon is one of a number of small towns on the Eastern Highveld located approximately 40km to the south-east of Springs. The town gives the impression of a scarce number of scattered buildings held together by a giant grain silo. The town's name is derived from the hometown of the surveyor, namely Devon in England. Nearby, but inaccessible to everybody but the military, is the underground nerve centre of the country's northern radar defence system.

8.4 A coal mining heritage

Coal mining on the eastern Highveld is now older than one century and has become the most important coal mining region in South Africa**.** Whilst millions of tons of high-grade coal are annually exported overseas more than 80% of the country's electricity is generated on low-grade coal in Eskom's power stations such as Duvha, Matla and Arnot situated near coal mines on the eastern Highveld.

The earliest use of coal (charcoal) in South Africa was during the Iron Age (300-1880AD) when metal workers used charcoal, iron and copper ores and fluxes (quartzite stone and bone) to smelt iron and copper in clay furnaces.

Colonists are said to have discovered coal in the French Hoek Valley near Stellenbosch in the Cape Province in 1699. The first reported discovery of coal in the interior of South Africa was in the mid-1830s when coal was mined in Kwa-Zulu/Natal.

The first exploitation for coal was probably in Kwa-Zulu/Natal as documentary evidence refers to a wagon load of coal brought to Pietermaritzburg to be sold in 1842. In 1860 the coal trade started in Dundee when a certain Pieter Smith charged ten shillings for a load of coal dug by the buyer from a coal outcrop in a stream. In 1864 a coal mine was opened in Molteno. The explorer, Thomas Baines mentioned that farmers worked coal deposits in the neighbourhood of Bethal (Transvaal) in 1868. Until the discovery of diamonds in 1867 and gold on the Witwatersrand in 1886, coal mining only satisfied a very small domestic demand.

With the discovery of gold in the Southern Transvaal and the development of the gold mining industry around Johannesburg came the exploitation of the Boksburg-Spring coal fields, which is now largely worked out. By 1899, at least four collieries were operating in the Middelburg-Witbank district, also supplying the gold mining industry. At this time coal mining also had started in Vereeniging. The Natal Collieries importance was boosted by the need to find an alternative for imported Welsh anthracite used by the Natal Government Railways.

By 1920 the output of all operating collieries in South Africa attained an annual figure of 9,5million tonnes. Total in-situ reserves were estimated to be 23 billion tonnes in Witbank-Springs, Natal and Vereeniging. The total in situ reserves today are calculated to be 121 billion tonnes. The largest consumers of coal are Sasol, Mittal and Eskom.

8.5 A vernacular stone architectural heritage

A unique stone architectural heritage was established in the eastern Highveld from the second half of the 19th century well into the early 20th century. During this time period stone was used to build farmsteads and dwellings, both in urban and in rural areas. Although a contemporary stone architecture also existed in the Karoo and in the Eastern Free State Province of South Africa a wider variety of stone types were used in the eastern Highveld. These included sandstone, ferricrete ('ouklip'), dolerite ('blouklip'), granite, shale and slate (Naude 1993).

The origins of a vernacular stone architecture in the eastern Highveld may be ascribed to various reasons of which the ecological characteristics of the region may be the most important. Whilst this region is generally devoid of any natural trees which could be used as timber in the construction of farmsteads, outbuildings, cattle enclosures and other structures, the scarcity of fire wood also prevented the manufacture of baked clay bricks. Consequently stone served as the most important building material in the eastern Highveld (Naude 1993, 2000). One of these historical structures was excavated and described after a heritage mitigation project was conducted for a coal mine (Pistorius 2005).

LIA Sotho, Pedi, Ndebele and Swazi communities contributed to the Eastern Highveld's stone walled architecture. The tradition set by these groups influenced settlers from Natal and the Cape Colony to utilise the same resources to construct dwellings and shelters. Farmers from Scottish, Irish, Dutch, German and Scandinavian descend settled and farmed in the eastern Highveld. They brought the knowledge of stone masonry from Europe. This compensated for the lack of fire wood on the Eastern Highveld which was necessary to bake clay bricks.

9 THE PHASE I HERITAGE IMPACT ASSESSMENT

9.1 The field survey

The field survey was conducted by means of following provincial and district roads as well as two track roads and any other accessible roads in the project area in order to gain access to the proposed power line corridors.

Figures 3 & 4- The project area is part of a landscape which incorporates grasslands which are used for grazing and which are interspersed with infrastructure such as dams which are utilised for irrigation agriculture (above and below).

Figure 5- Large parts of the project area are utilised for dry land agriculture (above).

Figure 6- The landscape in the most northern part of the project area was transformed as a result of open cast coal mining activities (above).

9.2 Types and ranges of heritage resources

The Phase I HIA for the proposed project area revealed the following types and ranges of heritage resources as outlined in Section 3 of the NHRA in and near the project area, namely:

- Historical remains consisting of farmsteads with outbuildings and other remains which are older than sixty years
- Graveyards and graves.

The historical remains, graveyards and graves were geo-referenced and mapped (Figure 7, Tables 1 & 2). The significance of these heritage resources is indicated as well as possible impacts on some of these heritage resources (Table 3).

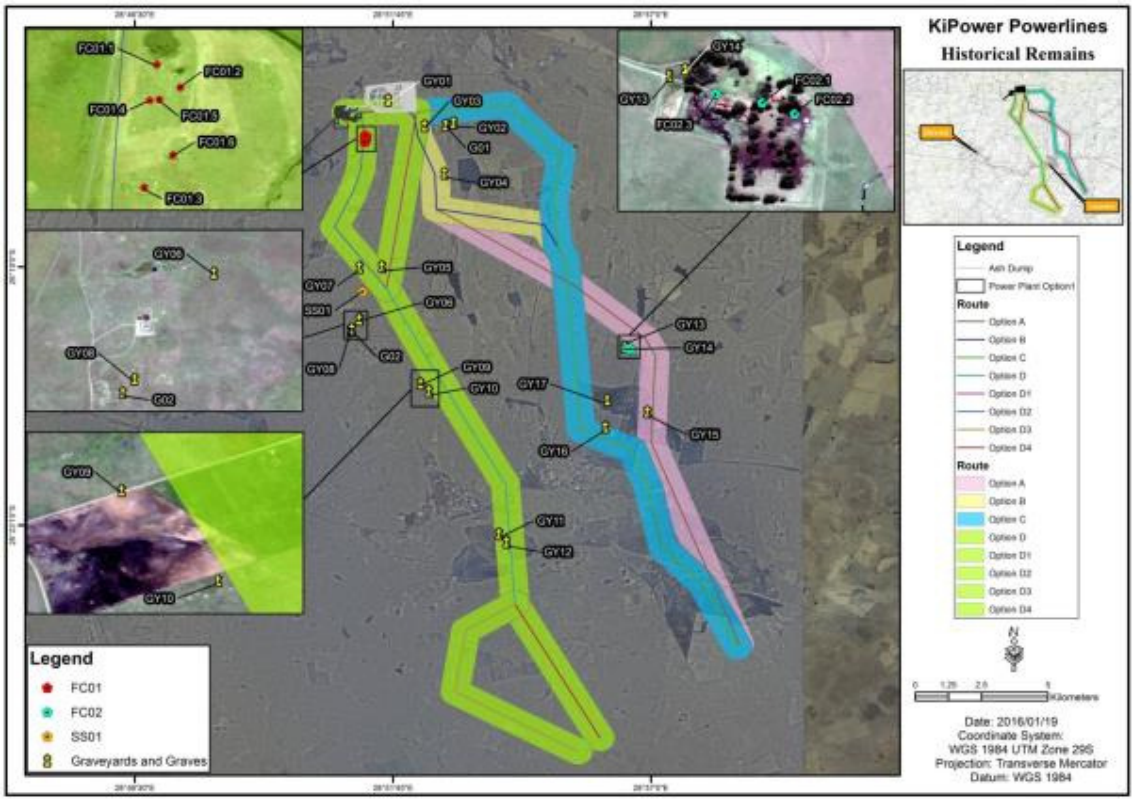


Figure 7- The KiPower power line project on the eastern Highveld in the Mpumalanga Province. Note the presence of heritage resources such as historical remains, graveyards and graves in and near the project area (above).

The significance of possible impacts on the heritage resources were determined (Table 4 & 5). Mitigation or precautionary measures are outlined for those heritage resources which occur near the proposed power line servitudes.

9.2.1 Historical remains

The project area at large is characterised by the presence of historical remains consisting of farmhouses with outbuildings which relate to two periods from the past, namely sandstone residences with wagon sheds and cattle enclosures which date from the second half of the nineteenth century and farm houses with outbuildings which date from the more recent past, namely from the 1930/40's to the 1960/70's. The latter remains are more common than the earlier historical remains. Infrastructure from both these periods in some instances is associated with graveyards belonging to individuals who used to occupy these remains.

These remains mostly constitute cultural landscapes composed of various independent but interrelated infrastructural components such as houses, wagon sheds, outbuildings, cattle enclosures, etc. of which certain of the structures have either collapsed or have been demolished. Most of the earlier historical remains, if they still exist, are severely dilapidated as they have been abandoned for some time. These remains are neither maintained nor are they renovated to be 'recycled' and to be utilised by farming communities. 'Restoration' that has been done on some of these structures has mostly diminished the structures' historical significance.

Stone structures from the Historical Period occur near some of the tributaries of the Steenkoolspruit on the farm Steenkoolspruit 302IR. These remains comprise of circular enclosures constructed with low stone walls. These walls were built with small stones and all the walls tend to be circular in ground plan. These stone walls do not resemble fully-flexed Iron Age stone walled sites. The remains probably served as foundations for circular dwellings whilst some of the enclosures may have been used to pen livestock such as sheep or goat. This small village probably dated from the late nineteenth century and most likely housed a small extended family. The following historical remains were documented in the project area namely:

9.2.1.1 Farmstead Complex 01

This farmstead complex (FC01) is located on the eastern shoulder of the Devon district road and involves a number of structures which date from various periods from the past.

The oldest of the remains incorporates at least three sandstone structures of which two are severely dilapidated. Both once served as residences. The third structure is an elongated cattle enclosure which is still in a good state of repair due to the fact that it was rebuilt using cement to stabilise the walls.

The second group of structures include a number of brick buildings which are scattered between the sandstone structures. Some served as residences or as water throughs whilst the purpose of others is not clear but they probably served an agricultural function considering the primary local economy.

Figure 8- Historical remains (FC01) consisting of sandstone buildings which amongst others were used as a residence (above) and a cattle enclosure which was constructed and re-built with sandstone and cement. These remains occur on Haverklip 265IR along the Devon district road (above).

Figure 9- A cattle enclosure which is part of FC01 along the Devon district road was reconstructed with historical sandstone and with modern cement (above).

Figure 10- Remains in FC01 on Haverklip 265IR along the Devon district road constructed with brick and concrete possibly served an agro-pastoral role considering the local economy of the area (above).

9.2.1.2 Farmstead Complex 02

Farmstead complex 02 (FC02) is located on the western shoulder of the provincial road that runs from Leslie in the south to the Delmas/Secunda road further to the north. FC02 comprises a number of structures which date from various periods from the past. Part of FC02 includes two graveyards in close proximity to the farmstead complex.

The structures which comprise FC02 are severely dilapidated and in some instances adapted to such an extent that the original structures are barely recognisable today. The main structures include the following:

- A residence (FC02.1) which dates from the 1930/40's which was constructed with clay bricks and fitted with a pitched corrugated iron roof. This structure has been extended in order to double its former size.
- A wagon shed (FC02.2) which was constructed with sandstone and fitted with a pitched corrugated iron roof. Two lean-to's were added on both sides of the main body of the wagon shed. This structure was constructed in the late nineteenth century.

Figure 11- The main residence (FC02.1) in FC02 comprises a dwelling which dates from the 1930/1940's which was extended at the back to double its size and which changed its original architectural appearance. The brick veranda wall is a more recent addition to the house (above).

- A possible second shed (FC02.3) which was constructed with dolerite stone and which was fitted with an iron corrugated roof. This structure has largely collapsed.

Figure 12- Dilapidated wagon shed (FC02.2) which was constructed with sandstone and fitted with a pitched corrugated iron roof in FC02 (above).

Figure 13- A second possible shed (FC02.2) which dates from the late nineteenth century between concrete silos which date from the more recent past. The shed was constructed with dolerite stone and is in a severe state of disrepair (above).

9.2.1.3 Stone structures

Stone structures (SS01) from the historical period occur near some of the tributaries of the Steenkoolspruit. These remains possibly comprise a small village which date from the late nineteenth century and most probably housed a small extended family.

Figure 14- Historical remains comprising of low stone circles that probably served as a small village for an extended family during the late nineteenth century (above).

Figure 15- The historical remains represent the foundations of dwellings and possible enclosures in which stock such as sheep and goat were penned (above).

9.2.2 Graveyards and graves

The following graveyards were observed in and near the project area, namely:

9.2.2.1 Graveyard 01

This family graveyard holds two graves which are fenced-in with a metal framework. The inscriptions on the two gravestones read as follow:

- 'Dirk Jakobus Gerhardus Stephanus Botha *13 Aug 1890 †25 Jan 1940'
- 'Wilhelmina Hart Botha (gebore Browne) *9 Feb 1900 †27 April 1966'

Figure 16- GY01 holds the remains of two individuals and is located in the midst of a Blue Gum lot (above).

9.2.2.2 Grave 01

The grave of Arthur Hart Browne is located in the midst of wattle trees. His grave is covered with a headstone manufactured from sandstone and bears the following inscription which is barely decipherable, namely:

- 'Arthur Hart Browne B 15-04-1864 D ??-??-1936'

Figure 17- G01 holds the remains of Arthur Hart Brown who was born in 1864 and who died in 1936 (above).

9.2.2.3 Graveyard 02

This graveyard (GY02) is located in the midst of wattle trees and holds the remains of three individuals. All three graves are fitted with headstones. The neatly decorated grave headstone bears the following inscription:

- Pulery Mashirja Sarah Born 29-07-1925 Died 5-07-1999'

A second cement headstone bears the name: 'Mashi'

9.2.2.4 Graveyard 03

This graveyard (GY03) contains the two graves of a father and his son. The grave of John Brown is decorated with a granite headstone with the following inscription, namely:

- 'John Brown B14-06-1922 D 15-11-1995'

His son, Willie Henry Brown's undecorated grave is only fitted with a stone. However, the date of birth and death are known, namely: Born 8-12-1956 Died 10-06-2000'.

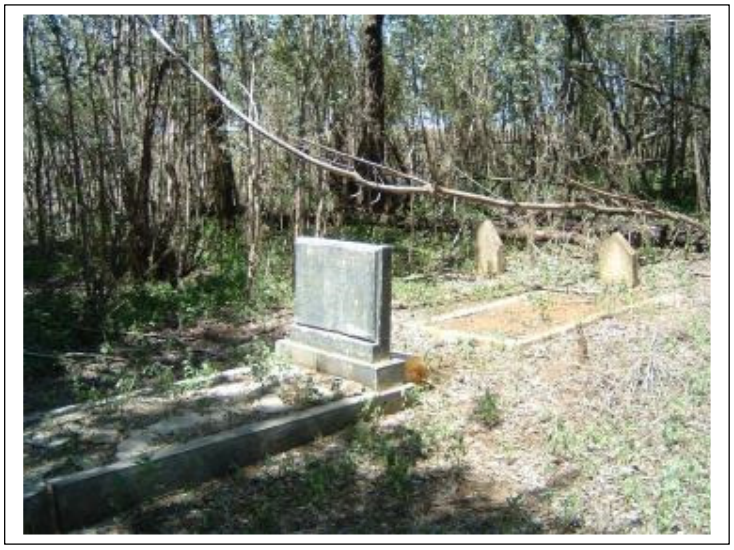


Figure 18- G02 holds the remains of three individuals and is located in the midst of a wattle bush (above).

Figure 19- GY03 holds the remains of Willie Henry Brown and John Brown (above).

9.2.2.5 Graveyard 04

Graveyard 04 is located in a soya field and contains the remains of more than fifty individuals. Most of the graves are decorated with cement stones but no longer contain any inscriptions. Some headstones with inscriptions have fallen over so that the inscriptions can't be read.

Inscriptions on some of the headstones which are decipherable read as follow, namely:

- 'Skumbuza'
- 'Lapakulele 1949 Olelelapa Usocomile ulelenco mhlaka 24-08-1961''

Figure 20- GY04 is located in a soya field and holds the remains of more than fifty individuals (above).

9.2.2.6 Graveyard 05

Graveyard 05 is located in open veld and holds the remains of approximately twenty individuals. Most of the graves are decorated with cement stones and edged with bricks. Very few of the headstones contain decipherable inscriptions.

Inscriptions on some of the headstones which are decipherable read as follow, namely:

- ‘Makhe Christina Mashaya 1945-04-18 2005-06-08 lala ngoxolo goda’
- ‘Mashaya Elliot Mohlupheki 09-06-1995’
- Richard P Cele

Figure 21- GY05 is located in open veld and holds the remains of approximately twenty individuals (above).

9.2.2.6 Graveyard 06

Graveyard 06 belongs to the Mahlangu family and is located in open veld. This graveyard (GY06) holds more than one hundred graves most of which are decorated whilst the remainder are covered with stones.

Inscriptions on some of the headstones read as follow, namely:

- ‘Speelman Mbonani B 20-05-1968 D 25-05-1968 RIP’
- ‘Ntini Mbonani walele 1921-11-06’
- ‘In loving memory of our dear Maria Mbonani Age 82 years Died 20-03-1975’
- ‘Elizabeth Nomtanlazo Motau Died 18-02-1984 Buried 25-02-1984’

Figure 22- GY06 holds more than one hundred graves and is located in open veld in close proximity with GY07 (above).

Figure 23- GY07 holds approximately ten graves within the confines of an enclosure which was constructed with stones. It is located in close proximity of GY06 (above).

9.2.2.7 Graveyard 07

Graveyard 07 is located in close proximity of GY06 and contains ten graves which are all located within the confines of an elongated enclosure which was constructed with stone.

At least five of the graves are edged with cement strips and fitted with cement headstones. Inscriptions on some of the headstones read as follow, namely:

- 'In loving memory of our grandmother Nathinwana Nabhida Mbonani'
- 'David Mbonani'

9.2.2.8 Graveyard 08

Graveyard 08 is located in open veld. It holds approximately fifty graves some of which are decorated.

Inscriptions on some of the headstones read as follow, namely:

- 'Phros Jiyoria 29-08-1971'
- 'Emelly Jiyane 01-01-1971'
- 'In loving memory of Sarah Mahlangu B 1950-05-13 D 1977-09-22 May your soul rest in peace'

9.2.2.9 Grave 02

Grave 02 is an isolated grave which is located in close proximity of GY08.

This grave belongs to Chillie Kabini.

Figure 24- GY08 holds more than fifty graves and is located in open veld in close proximity with G02 (above).

Figure 25- The grave which belongs to Chillie Kabini (G02) is located some distance from GY08 (above).

9.2.2.9 Graveyard 09

Graveyard 09 is located in open veld. It holds approximately eleven graves one of which is edged with bricks. The remainder of the graves are covered with heaps of stone. No headstones with inscriptions occur.

Figure 26- GY09 contains approximately eleven graves which are all, except one, covered with heaps of stones (above).

9.2.2.10 Graveyard 10

Graveyard 10 is located in open veld. It holds approximately twenty graves six of which are fitted with granite headstones. Some of the headstones have fallen over and only a few inscriptions can be read. Some of the graves are edged with bricks and fitted with cement headstones.

Inscriptions include the following, namely:

- 'In loving memory of our beloved Jabulane Speelman Skhosana 1971-03-07 You will always be remembered by your loving daughter and grandchildren May you Rest In Peace'
- Jeremiah Modonsela 1960 Rest In Peace'

Figure 27- GY10 contains approximately twenty graves a number of which are fitted with granite headstones some of which have fallen over (above).

9.2.2.11 Graveyard 11

GY11, to the south of Eendracht, near Leslie, is a large formal graveyard with several hundreds of graves most of which are decorated.

This graveyard is approaching sixty years of age.

The inscription on some of the granite headstones read as follow:

- 'Johannes Skhosana Born 1926 Died 06-07-1980 Lala Ngoxolo'

9.2.2.12 Graveyard 12

Graveyard 12 is located in open veld.

It holds nine graves which are all covered with heaps of stone. No headstones with inscriptions occur. It is located near the Eendracht graveyards (GY11).

Figure 28- GY11 holds hundreds of graves most of which are decorated and is located to the south of Eendracht near Leandra (above).

Figure 29- GY12 comprises nine heaps of stone in open veld. It is located near the Eendracht graveyard (GY11) near Leandra (above).

9.2.2.13 Graveyard 13

Graveyard 13 and GY14 are located on the western perimeter of Farmstead Complex 02.

GY13 comprises a small cemetery which is demarcated with a brick wall and which holds at least nine graves which are all decorated with granite headstones and trimmings.

Inscriptions on two of the headstones read as follow:

- 'Ter gedagtenis aan Andries Jacobus van Niekerk Geb 12 Julie 1883 Oorl 10 Oktober 1939'
- 'Johan Gerard Willemse'

Figure 30- GY13 comprises a small cemetery which was demarcated with a brick wall and which hold the graves of the Van Niekerk, Willemse and Dreyer families (above).

9.2.2.14 Graveyard 14

Graveyard 14 and GY13 are located on the western perimeter of Farmstead Complex 02.

GY14 may hold as many as forty graves some of which are decorated with headstones with inscriptions, namely:

- ‘Lidah Mantoantle Ditsego 04-06-1958’
- ‘Veli Betty Born 27-09-1908 Died 16-11-1979 In loving memory Vikayibambe Absalon Sibiya’
- ‘Magdalina Makabedi Ditysego’

Figure 31- GY14, next to GY13, holds no less than forty graves some of which are decorated (above).

9.2.2.15 Graveyard 15

Graveyard 15 is located in open veld and across a border fence. It holds approximately thirty graves some of which are decorated. Only a few of the headstones bear decipherable inscriptions such as the following:

- ‘Mathau Ditsego waduba Ngomhlala 08-11-1971’
- ‘Mabena Ntofinyane Born 1931-02-25 Died 1976-11-?’
- ‘In loving memory of our father Isaac Ditshego B13-08-1918 D22-11-1988’

Figure 32- GY15 is located in open veld and holds no less than thirty graves some of which are decorated (above).

9.2.2.16 Graveyard 16

Graveyard 16 is located in a cemetery which is demarcated with a dilapidated fence. At least six graves are visible in the graveyard of which five are decorated.

Inscriptions on the headstones read as follow:

- 'Hier rust ons eggenoot en vader Martinus Cornelius Landsberg Geb April 1864 Overleden Junie 1924 Ges 132.1'
- 'In liefdevolle herinnering aan mij dierbare echtgenoot Hendrik Frederik Kromhout Snyman Gebore 20 Julie 1889 Oorlede 20 Desember 1918'
- 'In loving memory of my dear husband James William Trollip Born 3 April 1853 at Fort Beaufort Died 20th April 1927 When my eyelids close in death

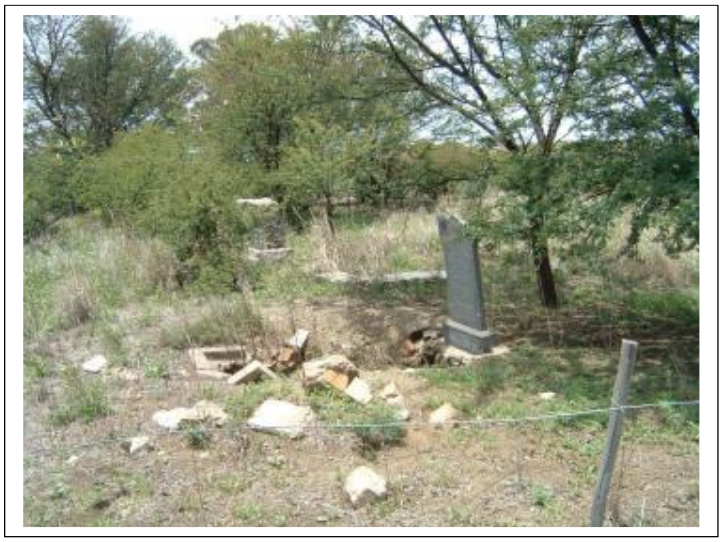


Figure 33- GY16 is demarcated with a fence and holds six graves (above).

9.2.2.17 Graveyard 17

Graveyard 17 is located in open veld next to a maize field. It holds approximately fifteen graves which are all covered with piles of stones. No inscriptions occur.

Figure 34- GY17 holds approximately fifteen graves which are covered with piles of stone (above).

9.3 Co-ordinates of historical features identified

Table 1 - Coordinates and significance rating for historical house (below).

HISTORICAL REMAINS		
	Coordinates	**Significance**
FC01		**Medium**
FC01.1 Large sandstone residence	26° 15 18.89's 28° 51 11.36 e	
FC01.2 Small sandstone residence	26° 15 20.44's 28° 51 12.94 e	
FC01.3 Large cattle enclosure	26° 15 27.16's 28° 51 10.51 e	
FC01.4 Cement drinking through	26° 15 21.30's 28° 51 10.89 e	
FC01.5 Brick silo	26° 15 21.24's 28° 51 11.53 e	
FC01.6 Large plastered structure with small outbuilding	26° 15 24.99's 28° 51 12.44 e	
FC02		**Medium**
FC02.1 Residence constructed with clay bricks and fitted with pitched corrugated iron roof	26° 19.658's 28° 56.576 e	
FC02.2 Wagon shed constructed with sandstone with lean-to's	26° 19.671's 28° 56.613 e	
FC02.3 Shed constructed with dolerite stone and pitched corrugated iron roof	26° 19.648's 28° 56.523 e	
SS01		**Medium**
Low stone walls	26° 18.494's 28° 51.136 e	

Table 2 - Coordinates and significance rating for graveyard (below).

GRAVEYARDS AND GRAVES		
	Coordinates	**Significance**
GY01.	26º 14 36.12's 28º 51 39.54e	**HIGH**
G01 Arthur Hart Browne	26° 15.111's 28° 52.823 e	**HIGH**
GY02. Three graves in wattle bush	26° 15 04.11's 28° 52 59.38 e	**HIGH**
GY03. John Brown and Willie Henry Brown	26° 15.126's 28° 52.397 e	**HIGH**
GY04. Large graveyard in soya field. Approximately 50 graves.	26° 16.093's 28° 52.804 e	**HIGH**
GY05. Approximately 20 graves in open veld	26° 17.991's 28° 51.531 e	**HIGH**
GY06. Mahlangu graveyard. More than one hundred graves	26° 19.064's 28° 51.068 e	**HIGH**
GY07. Ten graves in enclosure	26° 18.007's 28° 51.068 e	**HIGH**
GY08. Approximately fifty graves in open veld.	26° 19.262's 28° 50.920 e	**HIGH**
G02. Isolated grave of Chillie Kabini	26° 19.287's 28° 50.898 e	**HIGH**
GY09. Eleven graves in open veld	26° 20.361's 28° 52.316 e	**HIGH**
GY10. Approximately 20 graves in open veld	26° 20.522's 28° 52.488 e	**HIGH**
GY11. Eendracht graveyard with hundreds of graves	26º 23 25.58's 28º 53 54.64'e	
GY12. Nine graves in open veld	26° 23.595's 28° 54.065 e	**HIGH**

GY13. Approximately 9 graves demarcated with a brick wall	26° 19.628's 28° 56.470 e	**HIGH**
GY14. More than forty graves some of which are decorated.	26° 19.620's 28° 56.488 e	**HIGH**
GY15. Approximately 30 graves in open veld some of which are decorated.	26° 20.945's 28° 56.927 e	**HIGH**
GY16. Holds six graves within a demarcated area	26° 21.259's 28° 56.072 e	**HIGH**
GY17. Holds approximately fifteen graves in open veld	26° 20.704's 28° 56.112 e	**HIGH**

10 THE SIGNIFICANCE, POSSIBLE IMPACT ON AND MITIGATION OF THE HERITAGE RESOURCES

10.1 The significance of the heritage resources

The KiPower power line project may impact on some of the heritage resources. The significance of the heritage resources therefore has to be determined as well as the significance of any impact on the heritage resources. Mitigation measures are proposed for those heritage resources which may be affected by the KiPower power line project.

The significance of the heritage resources and the significance of the impact on the heritage resources were determined according to the types and ranges (categories) of heritage resources which were identified and criteria such as the aesthetical, research, educational and other value systems for the heritage resources in order to ensure that all types and ranges of heritage resources receive optimal mitigation measures.

The significance of possible impacts on the heritage resources was determined using a ranking scale based on the following:

- Occurrence
  - Probability of occurrence (how likely is it that the impact may/will occur?), and
  - Duration of occurrence (how long may/will it last?)
- Severity
  - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and
  - Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?).

Each of these factors has been assessed for each potential impact using the following ranking scales:

Probability: 5 – Definite/don't know 4 – Highly probable 3 – Medium probability 2 – Low probability 1 – Improbable 0 – None	Duration: 5 – Permanent 4 – Long-term (ceases with the operational life) 3 - Medium-term (5-15 years) 2 - Short-term (0-5 years) 1 – Immediate
Scale: 5 – International 4 – National 3 – Regional 2 – Local 1 – Site only 0 – None	Magnitude: 10 - Very high/don't know 8 – High 6 – Moderate 4 – Low 2 – Minor

The heritage significance of each potential impact was assessed using the following formula:

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

The maximum value is 100 Significance Points (SP). Potential environmental impacts are rated as very high, high, moderate, low or very low significance on the following basis:

- More than 80 significance points indicates VERY HIGH heritage significance.
- Between 60 and 80 significance points indicates HIGH heritage significance.
- Between 40 and 60 significance points indicates MODERATE heritage significance.
- Between 20 and 40 significance points indicates LOW heritage significance.
- Less than 20 significance points indicates VERY LOW heritage significance.

10.1.1 The significance of the historical remains

Two categories of historical remains were identified, namely farmstead complexes (FC01, FC02) and a site with stone structures or walls (SS01) (Table 1). These remains

comprise historical settlements which are older than sixty years which are protected by the National Heritage Resources Act (No 25 of 1999).

The significance of both these categories of historical remains can be rated as medium when considering criteria such as the following (Table 1):

- Both categories of historical remains can contribute to a better understanding of the lifeways of early inhabitants on the eastern Highveld in Mpumalanga.
- Both categories of historical remains are under threat due to an established agro-economic industry and an expanding coal mining complex on the eastern Highveld of Mpumalanga.
- Both categories of historical remains provide opportunities to be utilised in tourism, education and research particularly if further studied, renovated and applications to be utilised (e.g. in the tourism or leisure industry) can be implemented.

10.1.2 The significance of the graveyards and graves

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the NHRA (Act No 25 of 1999) in instances where graves are older than sixty years. It is highly likely that all the graves and graveyards in the project area are older than sixty years and if some of the graves are not this age they are approaching this time range as is laid down by the NHRA (Act No 25 of 1999). Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended).

10.2 Possible impact on the heritage resources

The different options for the proposed KiPower power line corridors indicate that a Farmstead Complex and several graveyards occur within the ambits of the one kilometre power line corridors and may be within or close to the power line servitudes once the final power line location has been determined. These heritage resources are listed in

Table 3 (Also refer to Figure 7). Not all of these heritage resources will be directly (physically) affected by the KiPower power lines if the final power line location is selected to avoid the heritage resources.

Table 3- Heritage resources within the one kilometre KiPower power line corridors (below).

Option A	Option B	Option C	Option D
Heritage resources within the one kilometre power line corridors			
Historical remains			
			FC01 (D2)
Graveyards and graves			
GY15	GY04	GY15	GY01 (D1)
GY01	GY01	GY01	GY03 (D1)
GY03	GY03		GY05 (D2)
GY04	GY16		GY07 (D2)
			GY11 (D)
			GY12 (D)

10.2.1 Possible impacts on the historical remains

Individual structures within FC01 may be impacted by the KiPower power lines as they occur within the one kilometre power line corridor. However, if the final power line alignment is selected to avoid the historical resources these resources may be avoided by the pylons (Tables 3, 4 & Figure 7).

The significance of the impacts on FC01 therefore is low (Table 4).

Table 4- The significance of potential impacts on FC01 (below).

	Probability of impact	Magnitude of impact	Duration of impact	Scale	Significance points	Significance rating	Significance after mitigation
FC01	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**

10.2.2 Possible impacts on the graveyards and graves

None of the graveyards and graves needs to be impacted by the power line servitude particularly if the final power line alignment with its associated pylons and power lines does avoid the graveyards (Tables 3, 5 & Figure 7).

The significance of any possible impact on any of the graveyards in the power line corridor therefore is low. This also applies when mitigation or precautionary measures are implemented (Table 5).

Table 5- The significance of potential impacts on the graveyards (below).

	Probability of impact	Magnitude of impact	Duration of impact	Scale	Significance points	Significance rating	Significance after management
GY01	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**
GY03	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**
GY04	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**
GY05	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**
GY07	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**
GY11	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**
GY12	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**
GY15	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**
GY16	**1**	**10**	**5**	**1**	**16**	**Low**	**Low**

10.3 Mitigating and managing the heritage resources

The following mitigation and management measures are outlined for those heritage resources which may be affected by the KiPower power lines, namely:

10.3.1 Mitigating the impacts on the historical remains

Mitigation measures are needed if Farmstead complex (FC01) is affected by the final chosen option for the KiPower power lines. Although the complex of structures is beyond repair FC01 has to be studied and documented by a historical architect before any of these remains may be affected in any way, e.g. to be altered or to be demolished as a result of the implementation of the KiPower line project. The SAHRA will require that the historical structures to be affected (and the complex as such) have be studied and documented by the conservation architect before SAHRA will make any recommendations regarding the future existence of these remains.

The significance of any possible impact on FC01 after the mitigation measures have been put in place will be low (Table 4).

10.3.2 Mitigating the impact on the graveyards

Cautionary measures should be taken not to disturb any of the graveyards in the power line corridors during the construction phase of the project. This can include the demarcation of graveyards in close proximity of the power line servitudes with red cautionary tape and 'Do not Disturb' signposts in order to avoid that the graveyards be damaged by construction personnel or their vehicles. No guidelines exist for safe distances between power lines and graveyards.

The significance of any possible impact on any graveyards after precautionary measures have been put in place will be low (Table 5).

11 CONCLUSION AND RECOMMENDATIONS

The Phase I HIA for the proposed project area revealed the following types and ranges of heritage resources as outlined in Section 3 of the NHRA (No 25 of 1999) in and near the project area, namely:

- Historical remains consisting of farmsteads with outbuildings and other remains which are older than sixty years
- Graveyards and graves.

The historical remains, graveyards and graves were geo-referenced and mapped (Figure 7, Tables 1 & 2). The significance of these heritage resources is indicated as well as possible impacts and the significance of possible impacts on some of these heritage resources were determined (Tables 4 & 5). Mitigation or precautionary measures are outlined for those heritage resources which occur near the proposed power line servitudes.

The significance of the heritage resources

The KiPower power line project may impact on some of the heritage resources. The significance of the heritage resources therefore has to be determined as well as the significance of any impact on the heritage resources. Mitigation measures are proposed for those heritage resources which may be affected by the KiPower power line project.

The significance of the heritage resources and the significance of the impact on the heritage resources were determined according to the types and ranges (categories) of heritage resources which were identified and criteria such as the aesthetical, research, educational and other value systems for the heritage resources in order to ensure that all types and ranges of heritage resources receive optimal mitigation measures.

The significance of possible impacts on the heritage resources was determined using a ranking scale based on various criteria.

The significance of the historical remains

Two categories of historical remains were identified, namely farmstead complexes (FC01, FC02) and a site with stone structures or walls (SS01) (Table 1). These remains comprise historical settlements which are older than sixty years which are protected by the National Heritage Resources Act (No 25 of 1999).

The significance of both these categories of historical remains can be rated as medium when considering criteria such as the following (Table 1):

- Both categories of historical remains can contribute to a better understanding of the lifeways of early inhabitants on the eastern Highveld in Mpumalanga.
- Both categories of historical remains are under threat due to an established agro-economic industry and an expanding coal mining complex on the eastern Highveld of Mpumalanga.
- Both categories of historical remains provide opportunities to be utilised in tourism, education and research particularly if further studied, renovated and applications to be utilised (e.g. in the tourism or leisure industry) can be implemented.

The significance of the graveyards and graves

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the NHRA (Act No 25 of 1999) in instances where graves are older than sixty years. It is highly likely that all the graves and graveyards in the project area are older than sixty years and if some of the graves are not this age they are approaching this time range as is laid down by the NHRA (Act No 25 of 1999). Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended).

Possible impact on the heritage resources

The different options for the proposed KiPower power line corridors indicate that a Farmstead Complex and several graveyards occur within the ambits of the one kilometre power line corridors and may be within or close to the power line servitudes once the final power line location has been determined. These heritage resources are listed in Table 3 (Also refer to Figure 7). Not all of these heritage resources will be directly (physically) affected by the KiPower power lines if the final power line location is selected to avoid the heritage resources.

Possible impacts on the historical remains

Individual structures within FC01 may be impacted by the KiPower power lines as they occur within the one kilometre power line corridor. However, if the final power line alignment may be selected to avoid the historical resources these resources may be avoided by the power lines (Tables 3, 4 & Figure 7).

The significance of the impacts on FC01 therefore is low (Table 4).

Possible impacts on the graveyards and graves

None of the graveyards and graves needs to be impacted by the power line servitude particularly if the final power line alignment with its associated pylons and power lines does avoid the graveyards (Tables 3, 5 & Figure 7).

The significance of any possible impact on any of the graveyards in the power line corridor therefore is low. This also applies when mitigation or precautionary measures are implemented (Table 5).

Mitigating and managing the heritage resources

The following mitigation and management measures are outlined for those heritage resources which may be affected by the KiPower power lines, namely:

Mitigating the impacts on the historical remains

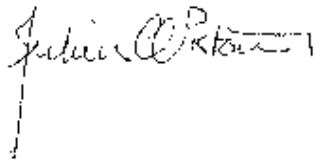
Mitigation measures are needed if Farmstead complex (FC01) is affected by the final chosen option for the KiPower power lines. Although the complex of structures is beyond repair FC01 has to be studied and documented by a historical architect before any of these remains may be affected in any way, e.g. to be altered or to be demolished as a result of the implementation of the KiPower line project. The SAHRA will require that the historical structures to be affected (and the complex as such) have be studied and documented by the conservation architect before SAHRA will make any recommendations regarding the future existence of these remains.

The significance of any possible impact on FC01 after the mitigation measures have been put in place will be low (Table 4).

Mitigating the impact on the graveyards

Cautionary measures should be taken not to disturb any of the graveyards in the power line corridors during the construction phase of the project. This can include the demarcation of graveyards in close proximity of the power line servitudes with red cautionary tape and 'Do not Disturb' signposts in order to avoid that the graveyards be damaged by construction personnel or their vehicles. No guidelines exist for safe distances between power lines and graveyards.

The significance of any possible impact on any graveyards after precautionary measures have been put in place will be low (Table 5).



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