

Prepared for:

Jones & Wagner Consulting Engineers

PO Box 1434

Rivonia 2128

Tel 0115190201 Fax 0115190201

**A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR A
PROPOSED RAW WATER SUPPLY PIPELINE FOR KIPOWER (PTY)
LTD NEAR DELMAS ON THE HIGHVELD AND EASTERN HIGHVELD
IN THE GAUTENG AND MPUMALANGA PROVINCES OF SOUTH
AFRICA**

Prepared by:

Dr Julius CC Pistorius

Archaeologist and Heritage Consultant

Member ASAPA

352 Rosemary Street Lynnwood 0081

PO Box 1255 Bela Bela 0480

Tel and fax (014)7362115

Cell 0825545449

October 2013

EXECUTIVE SUMMARY

This document contains a second updated 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 proposed raw water supply pipelines for KiPower (Pty) Ltd (KiPower) with two options to the south-east of Delmas on the Highveld and Eastern Highveld in the Gauteng and Mpumalanga Provinces of South Africa. An update of the report was required as one of the pipeline routes was changed.

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 National Heritage Resources Act (No 25 of 1999) (see Box 1) (except paleontological remains) are present in the pipeline 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 pipelines 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 pipelines.

The Phase I HIA for the 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) near the Project Area, namely:

- Informal and formal graveyards.
- A historical residence.

This study did not reveal the presence of any pre-historical remains in the Project Area neither did it provides for a paleontological study.

The graveyards and Historical House were geo-referenced and mapped (Figure 3, Tables 1 & 2). The significance of any possible impact on these heritage resources is indicated as well as mitigation measures should any of the graveyards be affected by the KiPower pipeline Project (Tables 4 & 5).

Possible impact on the heritage resources

The graveyards (GY01 to GY04) and Historical House (HH01) occur near the proposed raw water pipeline corridors. The Historical House (HH01) needs not to be affected by the

proposed water pipeline corridor as it is located more than fifty meters from the shoulder of the Devon road.

However, the graveyards occur closer to the proposed pipeline routes, namely:

- GY01 is situated within fifteen metres from the western shoulder of the Devon road and may be affected by the proposed pipeline.
- GY02 is situated approximately twenty five meters from the western shoulder of the Devon road and may be affected by the proposed pipeline.
- GY03 seems to be located more than thirty metres from the water pipeline and therefore need not to be affected by the water pipeline.
- GY04 is located six meters from the eastern shoulder of the dirt road which runs to Brakfontein 2641R and needs not to be affected if the pipeline is constructed along the western shoulder of the dirt road.

The significance of the heritage resources

The significance of the heritage resources is indicated as well as mitigation measures should any of the heritage resources be affected by the KiPower Pipeline Project.

The graveyards

All graveyards and graves are considered to be of high significance and are protected by various laws (Table 1). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (No 25 of 1999) whenever graves are older than sixty years. The act also distinguishes various categories of graves and burial grounds. 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).

The significance of any potential impacts on the graveyards is very low (Table 3).

The Historical House

All buildings and structures older than sixty years are considered to be of historical significance and are protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999). The Historical House (HH01) can be considered to be of medium significance when considering criteria such as the following (Table 4):

- Historical remains on the Eastern Highveld are disappearing at an alarming rate due to agricultural practices and the expansion of the coal mining industry.

- The residence is still intact and can add value to our knowledge regarding settlement and lifestyles during the early twentieth century on the Eastern Highveld.
- The Historical House has some research (scientific) value.

The significance of any potential impacts on the Historical House (HH01) is very low (Table 5).

Mitigating the heritage resources

The following mitigation measures have to be applied if any of the graveyards (GY01 to GY04) or the Historical House (HH01) is affected during the construction, operation or the decommissioning of the pipelines, namely:

The graveyards

Graveyards can be mitigated in two ways depending on whether they may be affected, directly or indirectly, namely:

- By means of exhumation and relocation when graveyards are affected directly. The exhumation of human remains and the relocation of graveyards are regulated by various laws, regulations and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 days statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains have to be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local police.
- Graveyards can be demarcated with brick walls or with fences when they are not affected in any physical way (but only indirectly). Conserving graveyards *in situ* in developed areas create the risk and responsibility that they may be damaged, accidentally, that the developer remains responsible for the graveyards' future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased.

The Historical House

The Historical House (HH01) needs not to be affected by the KiPower Pipeline Project and therefore needs no mitigation measures.

Conclusion

Option A and Option B for the proposed raw water supply pipelines share a common stretch where GY01 and GY02 are located. However, neither of these two graveyards needs to be affected by these pipelines as both graveyards are located at safe distances from the proposed pipeline corridors. Consequently, both pipeline routes are suitable for the construction of the proposed raw water supply pipeline.

GY03 will not be affected by Option B for the proposed pipeline as it is located at least thirty meters from the proposed pipeline.

GY04 will not be affected by the pipeline which runs on Brakfontein 264IR as the pipeline will be constructed on the western shoulder of the dirt road.

However, if any unforeseen direct or indirect impacts on the graveyards may occur as a result of the construction, operation or decommissioning of the raw water supply pipelines the mitigations measures as outlined in this report have to be followed.

General: disclaimer

It is possible that this Phase I HIA study may have missed heritage resources in the Project Area as heritage sites may occur in thick clumps of vegetation while others may lie 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 proposed raw water pipelines the South African Heritage Resources Agency (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 notify in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

Executive Summary	2
1 INTRODUCTION	8
2 TERMS OF REFERENCE	10
3 THE PROJECT AREA	11
3.1 Location	11
3.2 The nature of the project	13
3.3 The nature of the project area	14
4 APPROACH AND METHODOLOGY	15
4.1 Fieldwork	15
4.2 Databases, literature survey and maps	17
4.3 Assumptions and limitations	18
4.4 Some remarks on terminology	18
5 CONTEXTUALISING THE PROJECT AREA	22
5.1 Stone Age and rock art sites	22
5.2 Iron Age remains	24
5.3 The Historical Period	26
5.4 A coal mining heritage	28
5.5 A vernacular stone architectural heritage	28
6 THE PHASE I HERITAGE IMPACT ASSESSMENT	29
6.1 Types and ranges of heritage resources	29
6.2 Graveyards	30
6.2.1 Graveyard 01	30
6.2.2 Graveyard 02	31
6.2.3 Graveyard 03	32
6.2.4 Graveyard 04	32
6.3 Historical House	33
6.4 Tables	34
6.5 Possible impact on the heritage resources	35

6.6	The significance of the heritage resources	35
6.6.1	The graveyards	37
6.6.2	The Historical House	37
6.6	Mitigating the heritage resource impacts	39
6.6.1	The graveyards	39
6.6.2	The Historical House	40
7	CONCLUSION AND RECOMMENDATIONS	42
8	SELECT BIBLIOGRAPHY	46
9	BIBLIOGRAPHY RELATING TO EARLIER HERITAGE STUDIES	49
	APPENDIX A: DETAILS OF THE SPECIALIST	50
	APPENDIX B: DECLARATION OF INDEPENDENCE	51

1 INTRODUCTION

This document contains the second updated report on a Phase I Heritage Impact Assessment (HIA) study which was done for proposed raw water supply pipelines for KiPower (Pty) Ltd and for Delmas Coal on the Highveld and Eastern Highveld in the Gauteng and Mpumalanga Provinces of South Africa. An update of the report was required as one of the pipeline routes was changed.

Both the Gauteng and Mpumalanga Province have 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 these provinces therefore form a record of the heritage of most groups living in South Africa today.

Various types and ranges of heritage resources that qualify as part of South Africa's 'national estate' as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) occur in the Gauteng and Mpumalanga Provinces (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, 1999 (No 25 of 1999).

The National Heritage Resources Act (Act No 25 of 1999, Art 3) 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 palaeontological 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 Tissues Act, 1983 (Act No 65 of 1983);
- (h) sites of significance relating to the history of slavery in South Africa;
- (i) movable objects, including -
 - (i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological 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, Art 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 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 wishes to establish new raw water supply pipelines to the proposed KiPower Independent Power Producer (IPP) Power Plant and to Delmas Coal. These pipelines will traverse across parts of the Gauteng and Mpumalanga Provinces.

Activities relating to the construction, operation and eventual decommissioning of the raw water supply pipelines may have an influence on any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No. 25 of 1999). Consequently, Jones & Wagener (Pty) Ltd, the environmental consultant who is responsible for compiling the Basic Assessment report 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 raw water supply pipelines.

The aims with 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 National Heritage Resources Act (No 25 of 1999) (see Box 1) (except paleontological remains) 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 pipelines 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 pipelines.

3 THE PROJECT AREA

3.1 Location

KiPower (Pty) Ltd (KiPower) is a subsidiary of Kuyasa Mining which owns the Delmas Coal and Ikhwezi Collieries which are located approximately 20 kilometres south-east of Delmas in the Mpumalanga Province. KiPower proposes to establish the KiPower IPP Power Plant south of the R50 (which runs between Delmas and Leandra) on the farm Haverklip 256IR in close proximity to Delmas Coal. KiPower also intends to construct new raw water supply pipelines which may run across parts of the Gauteng and Mpumalanga Provinces (2628BD Leandra & 2628BB Kendal 1: 50 000 topographical map & 2628 East Rand 1: 250 000 map) (Figures 1-3).



Figure 1- Kipower's proposed raw water supply pipelines will be established on the Highveld and the Eastern Highveld of the Gauteng and Mpumalanga Provinces. The Project Area is characterised by an outstretched, rolling landscape with intervening pristine grass veld and agricultural fields (above).

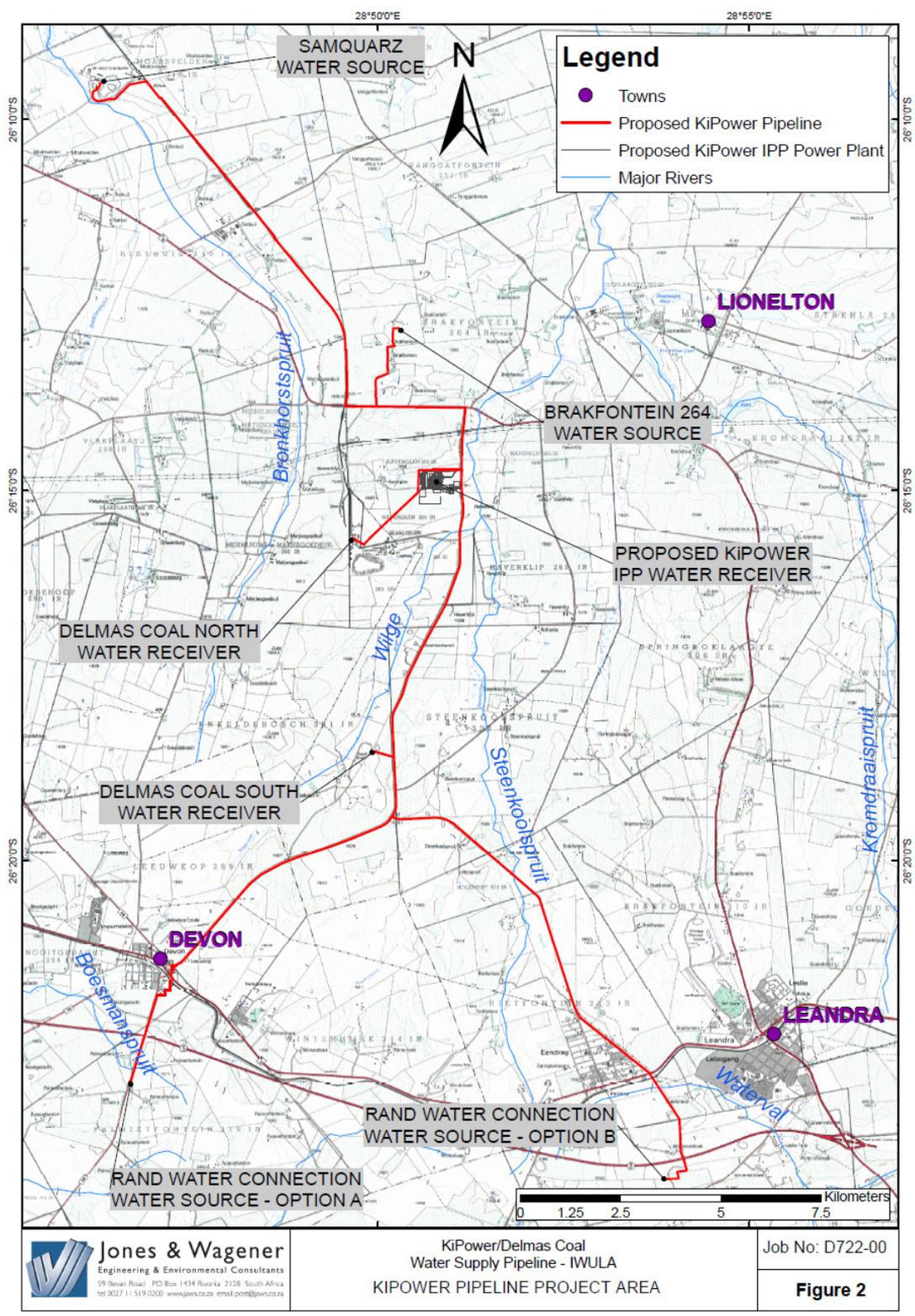


Figure 2- The Project Area for the proposed raw water pipelines between supply points south of Devon and Eendrag (Leandra) and from Samquartz and Brakfontein 264IR to the proposed KiPower Plant south-east of Delmas (above).

3.2 The nature of the KiPower pipeline Project

KiPower proposes to establish the KiPower IPP Power Plant in close proximity of Delmas Coal to the south of the R50 on the farm Haverklip 2561R. KiPower also proposes to establish raw water supply pipelines to the KiPower Power Plant and Delmas Coal. The proposed pipelines may traverse the Gauteng and Mpumalanga Provinces and therefore the jurisdiction of different municipalities.

Option A for the proposed pipelines will connect into the existing Rand Water pipeline south of Devon (Lesedi Local Municipality in the Sedibeng District Municipality) in the Gauteng Province and then will run northwards to the proposed KiPower Plant. Option B for the proposed pipeline will run from a connecting point south of Eendrag near Leandra in order to join the first water pipeline (Option A) further to the north. Additional pipelines will transport water from Samquarz and Blommeland on Brakfontein 2641R, north-west and north of the KiPower Plant in the Victor Khanye Local Municipality in the Nkangala District Municipality in the Mpumalanga Province.

Two shorter water supply pipelines will branch-off of the aforementioned pipeline in order to supply water to the Delmas Coal North Shaft and to the South Shaft respectively. The proposed raw water supply pipelines will be approximately 30km long (2628BD Leandra & 2628BB Kendal 1: 50 000 topographical map & 2628 East Rand 1: 250 000 map) (Figure 2).

The footprints for the proposed raw water pipeline corridors are referred to as the Project Area whilst the construction, maintenance and decommissioning of the raw water pipeline project is referred to as the KiPower Pipeline Project.

3.3 The nature of the Project Area

The proposed raw water supply pipelines run across parts of the Highveld and the Eastern Highveld in the Gauteng and Mpumalanga Provinces. The Project Area is characterised by an outstretched and slightly rolling landscape which comprises areas with pristine grassveld, dry-land agricultural fields which cover large surface areas as

well, pastures and grazing areas as well coal mining activities with associated infrastructure (Figure 3).

This part of the country 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 in the Eastern Highveld. The archaeological and historical significance of this cultural landscape is briefly outlined in this report (see Part 5, 'Contextualising the Project Area').

4 APPROACH AND METHODOLOGY

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

4.1 Field survey

Three field surveys were conducted, namely during November 2012 and during April and October 2013. The initial survey focussed on the Option A raw water supply pipeline whilst the second survey was undertaken due to the fact that the Option B raw water supply pipeline was added to the assessment.

The third survey for the raw water supply pipelines was undertaken as a result of the fact that the raw water pipeline which runs from Brakfontein 264IR in the north to the KiPower Plant in the south was added as another water supply point. A GPS track log was registered during the second and third field surveys (Figures 3[a] & 3[b]).

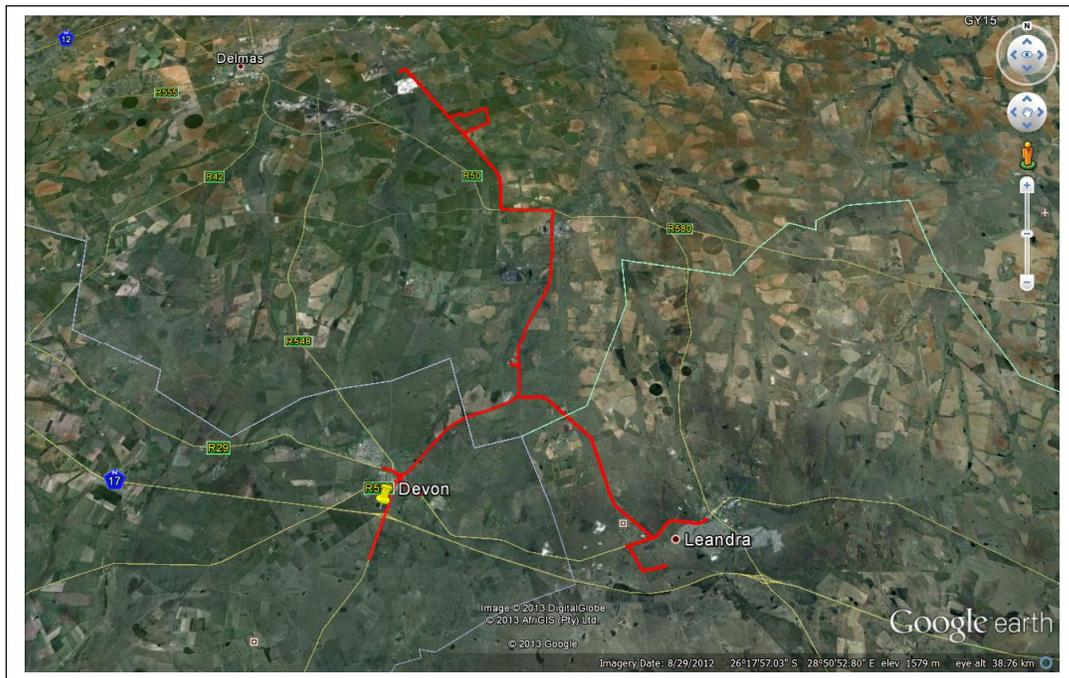


Figure 3(a) - Track log registered with a mounted GPS instrument along Option A and Option B for the proposed pipeline routes from where pedestrian surveys were conducted (above).



Figure 3(b) - Track log registered with a mounted GPS instrument along the proposed alignment for the proposed pipeline route which runs on Brakfontein 264IR (above).

The field survey for the proposed raw water supply pipelines was conducted with a vehicle whilst following road reserves within which the proposed pipelines will be constructed. Spots and niches along the pipeline routes were surveyed on foot, e.g. where building rubble could be observed, where certain types of intruder vegetation abounded or where former farmstead complexes existed, etc..

Several earlier heritage impact assessment studies have been done in close proximity to the current 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 EIA, 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 and Wagner.
- 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 and Wagner.
- 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 and Wagner.

4.2 Databases, literature survey and maps

Databases kept and maintained at institutions such as the Provincial Heritage Resources Agency (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 (see Part 8, 'Select Bibliography').

Literature relating to the pre-historical and the historical unfolding of the region where the Project Area is located was reviewed (see Part 5, 'Contextualising the Project Area' and Part 8 '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).

4.3 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 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 pipelines the South African Heritage Resources Authority (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.

4.4 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 2).
- 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.

5 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. The emphasis, however, is on the Mpumalanga Province as the largest part of the Project Area resorts under this province.

5.1 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 is 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 also has 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 veldt 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).

5.2 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.

5.3 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 Eendrag, 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 the 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.

5.4 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.

5.5 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.

6 THE PHASE I HERITAGE IMPACT ASSESSMENT

6.1 Types and ranges of heritage resources

The Phase I HIA for the 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) near the project area, namely:

- Informal and formal graveyards.
- A Historical House.

The graveyards and Historical House were geo-referenced and mapped (Figure 4, Tables 1 & 2). The significance of any possible impact on these heritage resources is indicated as well as mitigation measures should any of the graveyards be affected by the KiPower Pipeline Project (Tables 4 & 5).

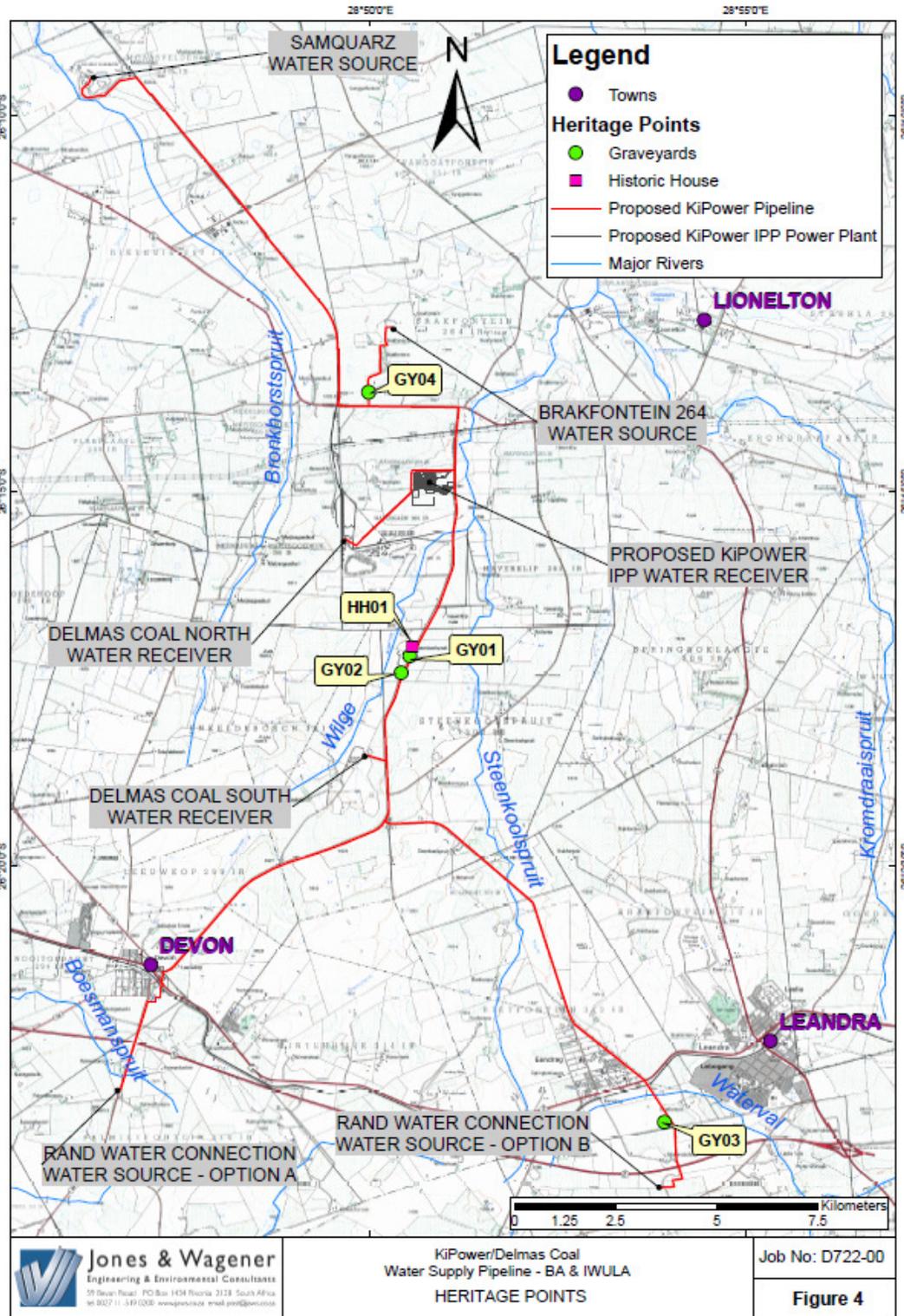


Figure 4- The proposed Project Area to the south-east of Delmas in the Gauteng and Mpumalanga Provinces of South Africa (above). Note the presence of graveyards and a Historical House in and near the Project Area (above).

6.2 Graveyards

The following graveyards were observed near the Project Area, namely:

6.2.1 Graveyard 01

GY01 on Steenkoolspruit 302IR GY01 is situated approximately fifteen metres from the western shoulder of the Devon road. It holds four graves which are decorated with granite headstones and trimmings. All four headstones have been disjointed and three of the headstones lay face-down. Subsequently the inscriptions are not visible. One of the graves is approaching sixty years of age. It is therefore likely that one or more of the remaining graves may be older than sixty years.

The inscription on the headstone of the fourth grave reads as follow:

- 'Hier rus ons dierbare vader en grootvader Davel Pieters Geb 1 April 1884 Oorl 8 April 1957'



Figure 5- GY01 near the western shoulder of the Devon road and therefore in close proximity of the proposed pipeline route holds four graves which are decorated with granite headstones and trimmings (above).

6.2.2 Graveyard 02

GY02 on Steenkoolspruit 302IR is located approximately twenty five meters from the western shoulder of the Devon road in close proximity of GY01. It holds approximately thirty-five graves of which the majority are edged with stones whilst some are decorated with cement strips and cement headstones. This graveyard is probably approaching sixty years of age.

The inscription on a granite headstone reads as follow:

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

Another inscription on a cement headstone reads as follow:

- 'Rashelenhleko Lapakulele wala la ngo mhlaku 4/1/1971 lapakulele uananhle kouralalanga mhlaka 3/1/1972'



Figure 6- GY02 near the western shoulder of the Devon road holds as many as thirty five graves, most of which are edged with stones (above).

6.2.3 Graveyard 03

GY03 to the south of Eendrag near Leandra is a large formal graveyard with several hundreds of graves most of which are decorated. GY03 is located more than thirty metres from the Option B water pipeline.

This graveyard is approaching sixty years of age.



Figure 7- GY03 is located more than thirty meters from the Option B water pipe line route which is situated to the south of Eendrag near Leandra. This graveyard holds hundreds of graves (above).

6.2.4 Graveyard 04

GY04 is located six meters from the eastern shoulder of the dirt road that runs to Brakfontein 264IR.

GY04 holds the remains of twelve individuals. The majority of the graves are covered with stones whilst at least one is fitted with a granite headstone. Three others are fitted with cement headstones and at least one is edged with cement strips.

Inscriptions on some of the head stones read as follow:

- 'Thandi Martha Mahlangu 1966-01-11, 1989-07-03 May your soul rest in peace'
- 'Mariya Masilela'
- 'Mahlangu Bafana 1999-11-04, 2003-02-12 Rest in peace'.

The majority of graves are probably older than sixty years.



Figure 8- GY04 is located next to a dirt road and holds twelve graves the majority of which are covered with stones (above).

6.3 Historical House

A Historical House (HH01) occurs near the Project Area. This structure dates from the 1940's and was constructed with face bricks and is fitted with a corrugated zink roof and steel window frames.



Figure 8- A Historical House (HH01) which was constructed with face bricks and fitted with a pitched corrugated zink roof situated near the Project Area (above).

6.4 Tables

Table 1- The coordinates and the significance of graveyards near the Project Area (below).

GRAVEYARDS	COORDINATES	SIGNIFICANCE
GY01	26° 17.203'S 28° 50.530'E	HIGH
GY02	26° 17.427'S 28° 50.415'E	HIGH
GY03	26° 23 25.58'S 28° 53 54.64'E	HIGH
GY04	26° 13 40.82'S 28° 49 58.76'E	HIGH

Table 2- The coordinates and the significance of a Historical House near the Project Area (below).

HISTORICAL HOUSE	COORDINATES	SIGNIFICANCE
HH01	26° 17.085'S 28° 50.600'E	MEDIUM

6.5 Possible impact on the heritage resources

The graveyards (GY01 to GY04) and Historical House (HH01) occur near the proposed raw water pipeline corridors. The Historical House (HH01) need not be affected by the proposed water pipeline corridor as it is located more than fifty meters from the shoulder of the Devon road.

However, the graveyards occur closer to the proposed pipeline routes, namely:

- GY01 is situated within fifteen metres from the western shoulder of the Devon road and may be affected by the proposed pipeline.
- GY02 is situated approximately twenty five meters from the western shoulder of the Devon road and may be affected by the proposed pipeline.
- GY03 is located more than thirty metres from the Option B water pipeline and therefore need not to be affected by the water pipeline.
- GY04 is located six meters from the eastern shoulder of the dirt road which runs on Brakfontein 264IR and needs not to be affected if the pipeline is constructed along the western shoulder of the dirt road.

6.6 The significance of the heritage resources

The significance of the heritage resources is indicated as well as mitigation measures should any of the heritage resources be affected by the KiPower Pipeline Project.

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

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Scale}) \times \text{Probability}$$

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

6.6.1 The graveyards

All graveyards and graves are considered to be of high significance and are protected by various laws (Table 1). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (No 25 of 1999) whenever graves are older than sixty years. The act also distinguishes various categories of graves and burial grounds. 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).

The impact assessment for the graveyards is given in Table 3.

Table 3: Significance of potential impacts on graveyards near the Project Area (below).

Grave-yards	Probability of impact	Magnitude of impact	Duration of impact	Scale of impact	Significance points	Significance rating
GY01	1	2	5	1	8	Very low

Grave-yards	Probability of impact	Magnitude of impact	Duration of impact	Scale of impact	Significance points	Significance rating
GY02	1	2	5	1	8	Very low
GY03	1	2	5	1	8	Very low
GY04	1	2	5	1	8	Very low

6.6.2 The Historical House

All buildings and structures older than sixty years are considered to be of historical significance and are protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999). The historical house (HH01) can be considered to be of medium significance when considering criteria such as the following (Table 4):

- Historical remains on the Eastern Highveld are disappearing at an alarming rate due to agricultural practices and the expansion of the coal mining industry.
- The residence is still intact and can add value to our knowledge regarding settlement and lifestyles during the early twentieth century on the Eastern Highveld.
- The Historical House has some research (scientific) value.

The impact assessment for Historical House (HH01) is given in Table 5.

Table 4- Significance rating for Historical House (HH01) in the Project Area (below).

Significance rating	Criteria for significance rating	Mitigation/Management Measures
High (3)	National/provincial value Educational, research, aesthetical conservation value Future use	Conserve unaffected for posterity (preferably) <i>in situ</i>
Medium (2)	Provincial value	Phase II investigation before

Significance rating	Criteria for significance rating	Mitigation/Management Measures
	Medium educational, research, aesthetical conservation value No future use	demolishing. Permitting required
Low (1)	Local and site specific value Low educational, research, aesthetical conservation value No future use	Document during Phase I HIA Demolish during construction. No permitting required

Table 5: Significance of potential impacts on Historical House (HH01) near the Project Area (below).

Historical House	Probability of project impacting on this site	Magnitude if project impacts on this site	Duration if project impacts on this site	Scale if project impacts on this site	Significance points	Significance rating
HH01	1	2	5	1	8	Very Low

6.7 Mitigating the heritage resources

The following mitigation measures have to be applied if any of the graveyards (GY01 to GY04) or the Historical House (HH01) is affected during the construction, operation or the decommissioning of the pipelines, namely:

6.7.1 The graveyards

Graveyards can be mitigated in two ways depending on whether they may be affected, directly or indirectly, namely:

- By means of exhumation and relocation when graveyards are affected directly.
The exhumation of human remains and the relocation of graveyards are

regulated by various laws, regulations and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 days statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains have to be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local police.

- Graveyards can be demarcated with brick walls or with fences when they are not affected in any physical way (but only indirectly). Conserving graveyards *in situ* in developed areas create the risk and responsibility that they may be damaged, accidentally, that the developer remains responsible for the graveyards' future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased.

6.7.2 The Historical House

The Historical House (HH01) needs not to be affected by the KiPower Pipeline Project and therefore needs no mitigation measures.

Conclusion

Option A and Option B for the proposed raw water supply pipelines share a common stretch where GY01 and GY02 are located. However, neither of these two graveyards needs to be affected by these pipelines as both graveyards are located at safe distances from the proposed pipeline corridors. Consequently, both pipeline routes are suitable for the construction of the proposed raw water supply pipeline.

GY03 will not be affected by Option B for the proposed pipeline as it is located at least thirty meters from the proposed pipeline.

GY04 will not be affected by the pipeline which runs on Brakfontein 264IR as the pipeline will be constructed on the western shoulder of the dirt road.

However, if any unforeseen direct or indirect impacts on the graveyards may occur as a result of the construction, operation or decommissioning of the raw water supply pipelines the mitigations measures as outlined in this report have to be followed.

7 CONCLUSION AND RECOMMENDATIONS

The Phase I HIA for the 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) near the project area, namely:

- Informal and formal graveyards.
- A Historical House.

The graveyards and Historical House were geo-referenced and mapped (Figure 3, Tables 1 & 2). The significance of any possible impact on these heritage resources is indicated as well as mitigation measures should any of the graveyards be affected by the KiPower Pipeline Project (Tables 4 & 5).

Possible impact on the heritage resources

The graveyards (GY01 to GY04) and Historical House (HH01) occur near the proposed raw water pipeline corridors. The Historical House (HH01) needs not to be affected by the proposed water pipeline corridor as it is located more than fifty meters from the shoulder of the Devon road.

However, the graveyards occur closer to the proposed pipeline routes, namely:

- GY01 is situated within fifteen metres from the western shoulder of the Devon road and may be affected by the proposed pipeline Option A and B.
- GY02 is situated approximately twenty five meters from the western shoulder of the Devon road and may be affected by the proposed pipeline Option A and B.
- GY03 is located more than thirty metres from the Eendrag water pipeline and therefore need not to be affected by the pipeline.
- GY04 is located six meters from the eastern shoulder of the dirt road which runs to Blommeland on Brakfontein 264IR and needs not to be affected if the pipeline is constructed along the western shoulder of the dirt road.

The significance of the heritage resources

The significance of the heritage resources is indicated as well as mitigation measures should any of the heritage resources be affected by the KiPower Pipeline Project.

The graveyards

All graveyards and graves are considered to be of high significance and are protected by various laws (Table 1). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (No 25 of 1999) whenever graves are older than sixty years. The act also distinguishes various categories of graves and burial grounds. 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).

The significance of any potential impacts on the graveyards is very low (Table 3).

The Historical House

All buildings and structures older than sixty years are considered to be of historical significance and are protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999). The historical house (HH01) can be considered to be of medium significance when considering criteria such as the following (Table 4):

- Historical remains on the Eastern Highveld are disappearing at an alarming rate due to agricultural practices and the expansion of the coal mining industry.
- The residence is still intact and can add value to our knowledge regarding settlement and lifestyles during the early twentieth century on the Eastern Highveld.
- The Historical House has some research (scientific) value.

The significance of any potential impacts on the Historical House (HH01) is very low (Table 5).

Mitigating the heritage resources

The following mitigation measures have to be applied if any of the graveyards (GY01 to GY04) or the Historical House (HH01) is affected during the construction, operation or the decommissioning of the raw water pipelines, namely:

The graveyards

Graveyards can be mitigated in two ways depending on whether they may be affected, directly or indirectly, namely:

- By means of exhumation and relocation when graveyards are affected directly. The exhumation of human remains and the relocation of graveyards are regulated by various laws, regulations and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 days statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains have to be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local police.
- Graveyards can be demarcated with brick walls or with fences when they are not affected in any physical way (but only indirectly). Conserving graveyards *in situ* in developed areas create the risk and responsibility that they may be damaged, accidentally, that the developer remains responsible for the graveyards' future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased.

The Historical House

The Historical House (HH01) needs not to be affected by the KiPower Pipeline Project and therefore needs no mitigation measures.

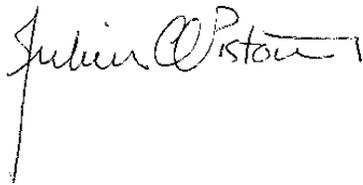
Conclusion

Option A and Option B for the proposed raw water supply pipelines share a common stretch where GY01 and GY02 are located. However, neither of these two graveyards needs to be affected by these pipelines as both graveyards are located at safe distances from the proposed pipeline corridors. Consequently, both pipeline routes are suitable for the construction of the proposed raw water supply pipeline.

GY03 will not be affected by Option B for the proposed pipeline as it is located at least thirty meters from the proposed pipeline.

GY04 will not be affected by the pipeline which runs on Brakfontein 264IR as the pipeline will be constructed on the western shoulder of the dirt road.

However, if any unforeseen direct or indirect impacts on the graveyards may occur as a result of the construction, operation or decommissioning of the raw water supply pipelines the mitigations measures as outlined in this report have to be followed.



DR JULIUS CC PISTORIUS

Archaeologist & Heritage Consultant

Member ASAPA

8 SELECT BIBLIOGRAPHY

Bergh, J.S. (red.) 1998. *Geskiedenisatlas van Suid Afrika. Die vier noordelike provinsies*. J.L. van Schaik: Pretoria.

Delius, P. 1984. *The land belongs to us*. Raven Press: Johannesburg.

Delius, P. 2007. *Mpumalanga. History and Heritage*. CTP Book Printers: Cape Town.

Delius, P. & Hay, M. 2009. *Mpumalanga: an illustrated history*. Johannesburg: The Highveld Press.

Erasmus, B.P.J. 1995. *Oppad in Suid Afrika. 'n Gids tot Suid Afrika, Streek vir Streek*. Jonathan Ball Uitgewers Bpk.

Esterhuysen, A. & Smith, J. 2007. *Stories in stone*. In Delius, P. (ed.) *Mpumalanga. History and Heritage*. University of Kwa Zulu Natal Press: Scottsville.

Evers, T.M. 1981. *The Iron Age in the Eastern Transvaal, South Africa*. In Voight, E.A. (ed.) *Guide to archaeological sites in Northern and Eastern Transvaal*. Pretoria: South African Association of Archaeologists, 64-109.

Hoernle, R.F. 1930. *The stone hut settlements on Tafelkop near Bethal*. *Bantu Studies*. 4, pp217-233.

Makhura, T. 2007. *Early inhabitants*. In Delius, P. (ed.) *Mpumalanga. History and Heritage*. University of Kwa Zulu Natal Press: Scottsville.

Mason, R.J. 1968. *Transvaal and Natal Iron Age settlement revealed by aerial photography and excavation*. *African Studies*. 27:167-180.

Naude, M. 1993. *The use of stone on farmsteads on the eastern Transvaal*. *Africana Society of Pretoria* (11): 49-55.

Naude, M. 2000. Vernacular stone buildings and structures on farmsteads in the southern districts of the Mpumalanga Province. *South African Journal of Cultural History*. 14(2): 31-64

Pistorius, J.C.C. 2002. *A Heritage Impact Assessment (HIA) study for a new power line on the farm Rietvallei 397JS between Middelburg and Arnot in the Mpumalanga Province of South Africa*. Unpublished report done for Eskom, Menlyn.

Pistorius, J.C.C. 2003. *A Heritage Impact Assessment study for the proposed 22kV Duvha Colliery power line deviation near Middelburg in the Mpumalanga Province of South Africa*. Unpublished report done for Eskom, Menlyn.

Pistorius, J.C.C. 2004. *A Heritage Impact Assessment (HIA) study for the EMP Amendment for Douglas Colliery in the Mpumalanga Province of South Africa*. Unpublished report for Pulles, Howard and De Lange.

Pistorius, J.C.C. 2004. *A Heritage Impact Assessment (HIA) study for the proposed new Optimum Colliery on the farm Schoonoord 164IS in the Mpumalanga Province of South Africa*. Unpublished report done for African EPA.

Pistorius, J.C.C. 2005. *Results of a Phase II Heritage Impact Assessment Study: An investigation of a historical sandstone farmstead and outbuildings on the banks of the Olifants River on the farm Kleynkopje 15IS within the boundaries of Douglas Colliery in the Mpumalanga Province of South Africa*. Unpublished report for the South African Heritage Resources Authority (SAHRA), Pulles Howard and De Lange (PHD) and Douglas Colliery.

Pistorius, J.C.C. 2007. *A Phase I Heritage Impact Assessment (HIA) study for the proposed deviation of a tributary of the Riet River in the Matla Colliery mining area on the Eastern Highveld in the Mpumalanga Province of South Africa*. Unpublished report for Golder.

Pistorius, J.C.C. 2013. A (Revised) baseline heritage study for Sasol's Mining's proposed Sasol Shondoni Project and for the Block 8 reserves on the Eastern Highveld in the Mpumalanga Province'. Unpublished report prepared for JMA Consulting (Pty) Ltd and Sasol Mining.

Potgieter, E.F. 1955. *The disappearing Bushmen of Lake Chrissie: A preliminary survey*. J. L. Van Schaik: Pretoria.

Prins, F.E. 2001. Rock art and motivation: the evidence from Magageng. *Pictogram*. 12: 14-18.

Pretorius, Fransjohan. 1999. *Life on commando during the Anglo Boer War 1899-1902*. Human & Rousseau: Cape Town.

Smith, B.W. & Zubieta, L. 2007. The power of ancient art. In Delius, P. (ed.) *Mpumalanga. History and Heritage*. University of Kwa Zulu Natal Press: Scottsville.

Schoonraad, M. & Beaumont, P. 1971. The Welgelegen Shelter, Eastern Transvaal. In Schoonraad M. (ed.). *Rock paintings of Southern Africa (Supplement to the South African Journal of Science*. Special Publication No. 2).

Schoonraad, M. & Schoonraad, E. 1975. Rotsskilderinge in die Oos Transvaalse Laeveld. In Barnard, C. (ed.) *Die Transvaalse Laeveld*. Cape Town: Tafelberg.

Schapera, I. 1927. The Tribal Divisions of the Bushmen. *Man*. Published by the Royal Anthropological Institute of Great Britain and Ireland. 27, 68-73.

Whitelaw, G. 1996. Lydenburg revisited. Another look at the Mpumalanga Early Iron Age sequence. *South African Archaeological Bulletin*. 51.

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 EIA, 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 and Wagner.

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 and Wagner.

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 and Wagner.

APPENDIX A: 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, Hartbeespoort 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 etc. as well as with several environmental companies.

APPENDIX B: 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:

22 October 2013

Date:

Signature of the Commissioner of Oaths:

Date:

Designation: