

Prepared for:

**ESKOM MEGAWATT PARK
ZITHOLELE CONSULTING**

**A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR
ESKOM'S PROPOSED RAILWAY LINE AND ASSOCIATED
INFRASTRUCTURE BETWEEN THE EXISTING PRETORIA-
WITBANK RAILWAY AND THE KUSILE POWER STATION IN THE
GAUTENG AND MPUMALANGA PROVINCES OF SOUTH AFRICA**

Prepared by:

**Dr Julius CC Pistorius
Archaeologist & Heritage Consultant
Member ASAPA**

**PO Box 1522
Roodekuil BELA BELA
0480**

Tel and fax (014)7362115

Cell 0825545449

July 2009

EXECUTIVE SUMMARY

A Phase I Heritage Impact Assessment (HIA) study as required in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999) was undertaken for Eskom's proposed railway line and associated infrastructure between the existing Pretoria – Witbank railway and the Kusile Power Station, in the Mpumalanga Province. The proposed railway project may impact 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, Zitholele Consulting commissioned the author to undertake a Phase I HIA study for the proposed railway study area with the following aims:

- 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) do occur within the perimeters of the rail project and, if so, to determine the level of significance of these heritage resources.
- To make recommendations regarding the mitigation or the conservation of any significant heritage resources that may be affected by the proposed railway project.

The Phase I Heritage Impact Assessment (HIA) study for the rail project revealed the following types and ranges of heritage resources as outlined in Section 38 of the National Heritage Resources Act, namely:

- Historical houses in farmstead complexes which are older than sixty years.
- At least eight graveyards
- Dolerite structures (dwellings) with historical significance.

These heritage resources were geo-referenced and mapped (Figure 2; Tables 1-3).

The significance of the heritage resources is indicated in Tables 1-2, whilst mitigation measures are proposed for those historical structures and graveyards which may be affected by the proposed railway line and associated infrastructure.

The significance of the heritage resources

The significance of the heritage resources is indicated by means of stipulations derived from the National Heritage Resources Act (No 25 of 1999) and specific criteria relating to each and every heritage resource that is evaluated.

Historical houses and dolerite structures

Historical structures older than sixty years or structures which are approaching this age are protected by Section 34 of the National Heritage Resources Act (No 25 of 1999). The significance of historical structures therefore has been indicated as Med-High (Tables 1 & 3).

However, the significance of each and every historical structure (house, outbuilding, etc) can further be scrutinised whenever these structures are to be affected by a development project and further studies need not be undertaken. Criteria according to which these structures can be evaluated include the following: the cultural-historical background of structures; their scientific or architectural value; their use in the field of tourism, museums or education as well as their aesthetic appearance; repeatability (scarcity), or their emotional (ideological) value.

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 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 laws with regard to graves (including those younger than sixty years) are 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

Alternative 01, Alternative 02 and Alternative 03 follow the same route from the existing Pretoria-Witbank railway line exiting to the N4. All three alternatives therefore may have an

impact on the following heritage resources and graveyards, namely: HH02, HH03 and HH04 as well as GY01.

From the N4 to the point where Alternative 01 and Alternative 02 diverge (split) the following impacts may occur, namely:

- Alternative 01 with GY04 and GY06.
- Alternative 02 with GY04 and GY06.
- Alternative 03 with GY05 and perhaps with a lesser possibility with GY06.

It seems as if no heritage resources will be affected from where Alternative 01 and Alternative 02 diverge (split) to where the three alternatives end at the Kusile Power Station. However, caution must be given to the following:

- GY08 is located in the middle between Alternative 01 and Alternative 02.
- Inconspicuous, abandoned graves may occur where Alternative 01 and Alternative 03 converge as this area was occupied by communities who lived along the southern banks of the tributary that merges with the Wilge River further to the west.

All three alternatives therefore seem to have some risk with regard to any possible impacts on historical structures and graveyards. However, it seems as if Alternative 03 may have the least impact on historical structures and graveyards between the N4 to the Kusile Power Station.

Alternative 03 therefore may be the preferred option for Eskom's proposed railway line from a heritage point of view. Linear development projects, such as the railway line, also provide the opportunity that the railway line may be deviated in order to avoid significant heritage sites such as large graveyards.

Mitigating the heritage resources

If any of the historical structures or graveyards may be affected by the proposed new railway line and associated infrastructure the following mitigation measures have to be applied to these historical structures and graveyards, namely:

Historical houses and dolerite structures

Historical houses may not be affected (demolished, renovated, altered) by the railway line

project *prior* to their investigation by a historical architect in good standing with the South African Heritage Resources Agency (SAHRA). The historical architect has to acquire a permit from the South African Heritage Resources Authority (SAHRA) (provincial) *prior* to any of these structures being affected or altered (demolished, renovated) as a result of railway line project

The dolerite structures have to be investigated by an archaeologist accredited with the Association for Southern African Professional Archaeologists (ASAPA) *prior* to their demolition by the railway line project. The archaeologist has to obtain a permit from the South African Heritage Resources Authority (SAHRA) (national) and must document these structures before they may be affected by the railway line project.

Graveyards and graves

Graveyards and graves can be mitigated by adhering to the following strategies, namely:

- Graveyards can be demarcated with brick walls or with fences when they are retained *in-situ* within 30m from the railway line or associated infrastructure.
- Graveyards can also be exhumed and relocated whenever they are located in the railway line corridors. 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.

General

If any heritage resource of significance is exposed during the proposed railway project 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 and/or processes for the

discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

TABLE OF CONTENTS

| | | |
|-----------|--|-----------|
| 1 | INTRODUCTION..... | 1 |
| 2 | TERMS OF REFERENCE | 3 |
| 3 | THE PROPOSED RAILWAY PROJECT | 4 |
| 3.1 | Location..... | 4 |
| 3.2 | Within a cultural landscape | 4 |
| 4 | METHODOLOGY..... | 6 |
| 4.1 | Fieldwork..... | 6 |
| 4.2 | Databases, literature survey and maps | 6 |
| 4.3 | Assumptions and limitations..... | 7 |
| 4.4 | Some remarks on terminology | 7 |
| 5 | CONTEXTUALISING THE PROPOSED RAILWAY STUDY AREA..... | 9 |
| 5.1 | Stone Age sites | 9 |
| 5.2 | Iron Age remains..... | 9 |
| 5.3 | The historical period..... | 10 |
| 5.4 | A coal mining heritage..... | 11 |
| 5.5 | A vernacular stone architectural heritage..... | 12 |
| 6 | THE PHASE I HERITAGE IMPACT ASSESSMENT | 14 |
| 6.1 | Types and ranges of heritage resources..... | 14 |
| 6.2 | Historical structures..... | 16 |
| 6.3 | Graveyards..... | 21 |
| 7 | THE SIGNIFICANCE, POSSIBLE IMPACT ON AND MITIGATION OF THE HERITAGE RESOURCES | 30 |
| 7.1 | The significance of the heritage resources..... | 30 |
| 7.3 | Mitigating the heritage resources | 32 |
| 8 | CONCLUSION AND RECOMMENDATIONS | 34 |
| 9 | SELECT BIBLIOGRAPHY..... | 38 |
| 10 | SPOKESPERSONS CONSULTED..... | 40 |

1 INTRODUCTION

The proposed Kusile railway line project entails the construction of a railway line and associated infrastructure, for the transportation of sorbent from a commercial source north of Pretoria, and it comes off from the existing Pretoria-Witbank railway line, two kilometres north of the N4 highway, to Kusile Power Station, situated west of eMalahleni (Witbank) in Mpumalanga. Three alternative corridors for the railway line have been proposed.

Focused archaeological research has been conducted in the Gauteng and Mpumalanga Provinces of South Africa for more than four decades. This research consists of surveys and of excavations of Stone Age and Iron Age sites as well as the recording of rock art and historical sites. The Gauteng and Mpumalanga Provinces have a rich heritage comprised of remains dating from the pre-historical and from the historical (or colonial) periods of South Africa. Pre-historical and historical remains in the Gauteng and Mpumalanga 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 as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999).

The National Heritage Resources Act (Act No 25 of 1999, Section 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 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, 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

Eskom intends to construct a railway line with associated infrastructure on the Eastern Highveld in the Gauteng and Mpumalanga Provinces of South Africa. The proposed railway project may impact 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, Zitholele Consulting and Eskom commissioned the author to undertake a Phase I HIA study for the proposed rail project with the following aims

- 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) do occur in or near the alternatives for the railway line and, if so, to determine the level of significance of these heritage resources.
- To make recommendations regarding the mitigation or the conservation of any significant heritage resources that may be affected by the proposed project.

3 THE PROPOSED RAILWAY PROJECT

3.1 Location

The proposed railway study area covers a piece of land between Bronkhorstspuit in the west, Witbank in the east and Ogies in the south. The study area stretches across the undulating Eastern Highveld of the Gauteng and Mpumalanga Provinces of South Africa which is marked by outstretched agricultural fields as well as untouched pieces of grassveld. The study area runs from the existing Pretoria – Witbank railway line between Bronkhorstspuit and Witbank in the north southwards across the R104 and the N4. It crosses the farms Onverwacht 532IR, Kortfontein 530JR and Bossemanskraal 538JR and runs southwards along the Wilge River and then eastwards towards the emerging Kusile Power Station (2528DD Balmoral 1:50 000 topographical map and 2528 Pretoria 1:250 000 map) (Figures 1-2).

This part of the Mpumalanga Province is known for its long standing production of agricultural crops such as maize wheat, sorghum, dairy, potatoes and other vegetables. Cattle and sheep ranching also make a significant contribution to the local economy. Gold and silica mines also occur in the area.

3.2 Within a cultural landscape

The study area is located in the midst of a cultural landscape that is marked by heritage remains dating from the pre-historical into the historical (colonial) period. Stone Age sites, Iron Age sites and colonial remains therefore do occur in the Eastern Highveld (see Part 7 ‘Select Bibliography’).

The archaeological and historical significance of this cultural landscape therefore must be described and explained in more detail before the results of the Phase I HIA study are discussed (see below, Part 5).



Figure 1- The Kusile Power Station (far background) under construction on Hartbeestfontein 537 and Klipfontein 566 on the Eastern Highveld of the Mpumalanga Province (above).

The study area is an undulating piece of land which is characterised by outstretched grass veldt and agricultural fields in the south. In the north the study area is dotted with farmstead complexes which are usually associated with Blue Gum avenues or with smaller plantations of these trees. Some of these farmstead complexes incorporate historical houses with associated outbuildings as well as graveyards.

4 METHODOLOGY

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

- Surveying the proposed railway study area with a vehicle and selected spots on foot considering the size of the study area (see Part 4.3).
- Briefly surveying literature relating to the pre-historical and historical context of the proposed railway study area.
- Consulting maps of the proposed railway study area.
- Consulting archaeological (heritage) data bases.
- Consulting spokespersons regarding the possible presence of graves and graveyards in the study area (see Part 10).
- Synthesising all information obtained from the data bases, fieldwork, maps and literature survey.

4.1 Fieldwork

The proposed railway study area was surveyed with a vehicle where accessible roads existed while selected, sensitive spots in the study area were surveyed on foot.

4.2 Databases, literature survey and maps

Databases kept and maintained at institutions such as the Provincial Heritage Resources Agency (PHRA) and the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria were consulted to determine whether any heritage resources of significance has been identified during earlier heritage surveys in or near the proposed railway study area.

The author is not unacquainted with the proposed larger railway study area as he had done several heritage impact assessment studies near the proposed study area (see Part 8, 'Select Bibliography').

Literature relating to the pre-historical and the historical unfolding of the Eastern Highveld where the proposed railway study area is located was reviewed (see Part 5, 'Contextualising the proposed railway study area').

It is important to contextualise the pre-historical and historical background of the proposed railway study area in order to comprehend the identity and meaning of heritage sites in and near the study area.

In addition, the proposed railway study area was studied by means of maps on which it appears (2528DD Balmoral 1:50 000 topographical map & 2528 Pretoria 1: 250 000).

4.3 Assumptions and limitations

It is possible that this Phase I HIA study may have missed heritage resources in the proposed railway study 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 project execution 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 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 in Box 2.

Box 2. Terminologies that may be used in this report

The Heritage Impact Assessment (HIA) referred to in the title of this report includes a survey of heritage resources as outlined in the National Heritage Resources Act, 1999 (Act No 25 of 1999) (See Box 1).

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.

The term '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 Proposed railway study area, to the first appearance or use of 'modern' Western writing brought to the Eastern Highveld by the first Colonists who settled in this area during the 1830's.

The term 'relatively 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.

It is not always possible, based on observations alone, to distinguish clearly between archaeological remains and historical remains, or between historical remains and remains from the relatively recent past. Although certain criteria may help to make this distinction possible, these criteria are not always present, or, when they are present, they are not always clear enough to interpret with great accuracy. Criteria such as square floor plans (a historical feature) may serve as a guideline. However, circular and square floors may occur together on the same site.

The term 'sensitive remains' is sometimes used to distinguish graves and cemeteries as well as ideologically significant features such as holy mountains, initiation sites or other sacred places. Graves in particular are not necessarily heritage resources if they date from the recent past and do not have head stones that are older than sixty years. The distinction between 'formal' and 'informal' graves in most instances also refers to graveyards that were used by colonists and by indigenous people. This distinction may be important as different cultural groups may uphold different traditions and values with regard to their ancestors. These values have to be recognised and honoured whenever graveyards are exhumed and relocated.

The term 'Stone Age' refers to the prehistoric past, although Late Stone Age peoples 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).

The term '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.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the pre-historical, historical or the relatively recent past.

The term 'study area', or 'Proposed railway study area' refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data in order to establish the presence of all possible types of heritage resources in any given area.

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 bodies and the relocation of graveyards, etc. Phase II work may require the input of specialists and requires the co-operation and approval of SAHRA.

5 CONTEXTUALISING THE PROPOSED RAILWAY STUDY AREA

The following brief overview of pre-historical, historical, cultural and economic evidence will help to contextualise the proposed railway study area.

5.1 Stone Age 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 (covers the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (refers to the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (the period from 22 000 years ago to 200 years ago).

The Later Stone Age is also associated with rock paintings and engravings which were done by the San, Khoi Khoi and in more recent times by Iron Age farmers.

Heritage surveys up to now have recorded few Stone Age sites, rock paintings and engravings in the Eastern Highveld.

5.2 Iron Age remains

The Iron Age is associated with the first agro-pastoralists 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 (covers the 1st millennium AD) and the Later Iron Age (covers the first 880 years of the 2nd millennium AD).

The Eastern Highveld has not been occupied by Early Iron Age communities but was occupied by Late Iron Age communities such as the Sotho, Swazi and Ndebele who established settlement complexes that are associated with stone walls.

5.3 The historical period

Towns closest to the proposed railway study area include Bronkhorstspuit in the north-west, Ogies in the south-east and Witbank in the north-east. A brief historical background to each of these towns is provided below.

Bronkhorstspuit was laid out by Cornelius Erasmus on a part of his farm Hondsrivier in 1904. The town was named Erasmus for a number of years. From July 1935, the town's name, which is derived from a water-cress called 'bronkhors' by early settlers, was changed to Bronkhorstspuit.

Bronkhorstspuit is rich in heritage resources. The town and its outskirts were occupied from the earliest times by Stone Age peoples while Iron Age farmers, who preferred the rocky ridges and outcrops exposed in the rolling landscape, occupied the area from the 17th century onwards. The first Colonists who moved north of the Vaal River during the second half of the 20th century also established farm homesteads, outbuildings and infrastructure across the landscape. The first railroad line between Pretoria and Delagoa Bay passed through Donkerpoort, close to Eskom's study area. Important battles between the Boers and British forces were fought close to Bronkhorstspuit during the Anglo Boer Wars. Blockhouses and other military infrastructure therefore occur close to the study area.

Ogies serves as an important link in the running railway line running between Pretoria and Maputo which was built in 1896. It is also linked via Broodsnyersplaas, 35km south of Middelburg to join the railway line between Ermelo and Piet Retief to Richards Bay. This railway line carries some of the

longest and heaviest trains in the world. The town of Ogies developed around the railway station which was built on the farm Ogiesfontein in 1928.

Witbank came into being as the railway line between Pretoria and Lourenzo Marques which was built in 1894 passed close to where Witbank is located today. The first Europeans who came to the area observed the abundance of coal, which is evident on the surface or in the beds of streams. A stage post for wagons close to a large outcrop of whitish stones (a 'white ridge') gave the town its name. Witbank was established in 1903 on a farm known as Swartbos which belonged to Jacob Taljaard.

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 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-1830 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 colliers were operating in the Middelburg-Witbank district, also supplying the gold mining industry. At this time coal mining also 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 colliers in South Africa attained an annual figure of 9,5 million 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, Iscor 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.

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.

Late Iron Age communities who contributed to the Eastern Highveld's stone walled architecture were the Sotho, Pedi, Ndebele and Swazi. The tradition set by these indigenous groups may have influenced the first settlers from Natal and the Cape Colony to utilize the same resources that their predecessors did. Many farmers from Scottish, Irish, Dutch, German and Scandinavian descent settled and farmed in the Eastern Highveld. These colonials brought the knowledge of stone masonry from Europe which compensated for the lack of fire wood necessary to manufacture baked clay bricks.

6 THE PHASE I HERITAGE IMPACT ASSESSMENT

6.1 Types and ranges of heritage resources

The Phase I Heritage Impact Assessment (HIA) study for the proposed railway study area revealed the following types and ranges of heritage resources as outlined in Section 38 of the National Heritage Resources Act, namely:

- Historical houses in farmstead complexes which are older than sixty years.
- At least six graveyards.
- Dolerite structures (dwellings) with historical significance.

These heritage resources were geo-referenced and mapped (Figure 2; Tables 1-3).

The significance of the heritage resources is indicated (Tables 1-2) whilst mitigation measures are proposed for those historical structures and graveyards which may be affected by the proposed railway line and associated infrastructure.

The Phase I HIA study is now briefly discussed and illustrated with photographs.

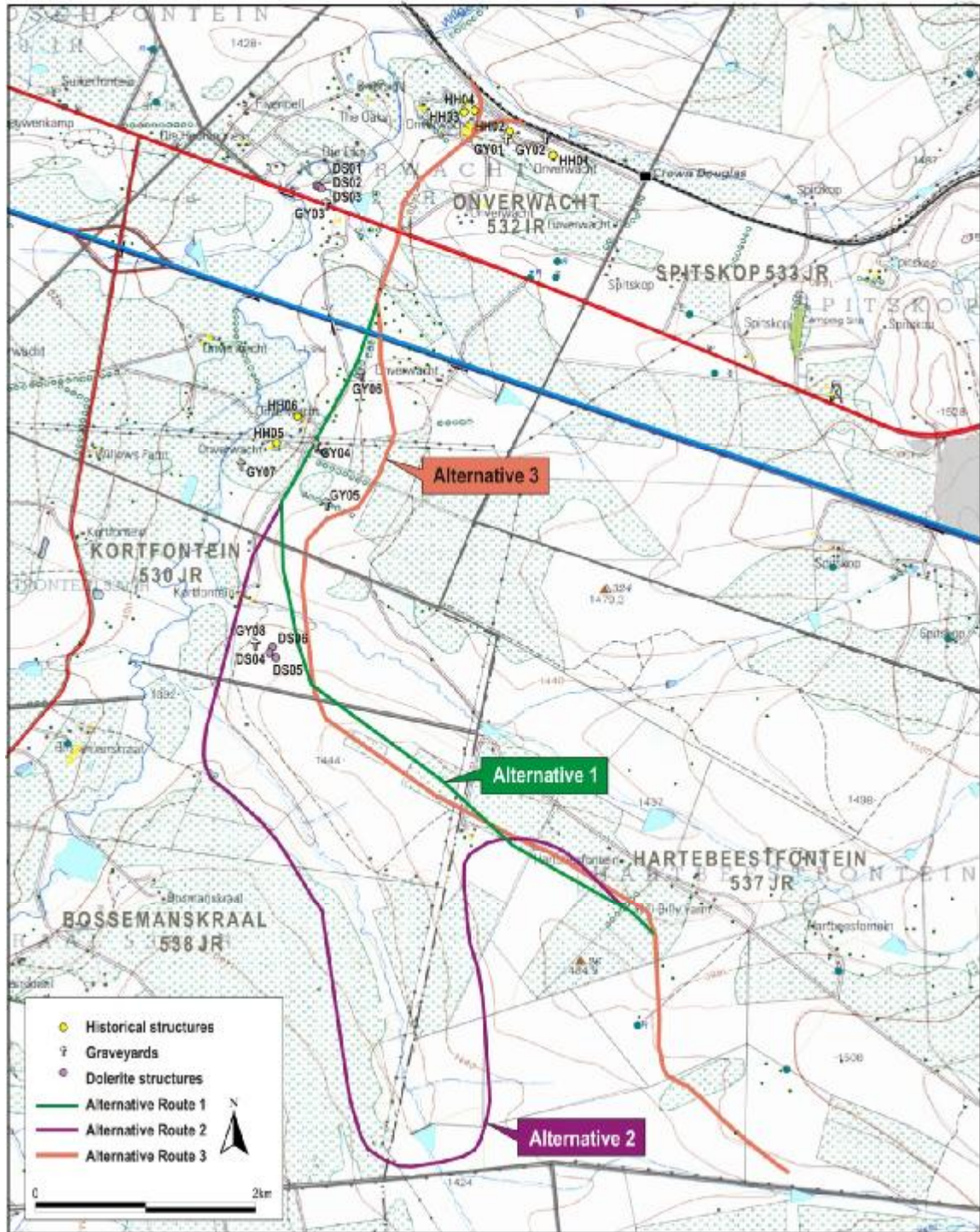


Figure 2- The Eskom Project Area between Bronkhorstspuit, Witbank and Ogies in the Gauteng and Mpumalanga Provinces of South Africa.

Note the three alternatives for the railway line as well as heritage resources in the Project Area (above).

6.2 Historical structures

Several farmstead complexes are scattered across the proposed railway study. Most are confined to the northern part of the proposed railway study area, to the north and to the south of Road 104 which runs across the northern part of the project area. The predecessor of this road used to serve as the main link between Pretoria and Belfast. Consequently, some of the oldest colonial dwellings were established along this road.

Most of the farm homesteads in the railway study area consist of a mixture of a number of structures which usually include at least one historical structure. Many of these historical buildings (older than sixty years), which used to consist of main dwellings with outbuildings, have been altered in the past, or have been abandoned, and many have fallen beyond repair or renovation.

The following farmstead complexes with historical buildings have been identified. Their locations in relation with the alternatives for the railway alternatives are indicated in Figure 2.

6.2.1 Farmstead complex 01

This farmstead complex consists of two remaining structures of which one is a historical house. This complex has been abandoned and used to incorporate a number of structures which now have been demolished. At least one dwelling, which qualifies as a historical structure, namely Historical House 01 (HH01), still remains.

HH01 is a rectangular dwelling with a pitched corrugated roof and was probably constructed during the 1920's. The house has been extended during the more recent past when a room constructed with face bricks was added to the frontal part of this house. These alterations do not affect its historical status.



Figure 3- Historical House 01 is part of Farmstead Complex 01 which is located near the existing Pretoria – Witbank railway line in the northern part of the project area (above).

6.2.2 Farmstead complex 02

This farmstead complex is relatively modern and includes at least seven buildings. Only one of these buildings qualifies as a historical house. Historical House 02 (HH02) was constructed during the 1930's or 1940's and is currently still used by the Coertze family.

HH02 is a square building which was constructed with bricks and cement and is fitted with a pitched corrugated iron roof.

6.2.3 Historical House 03

Historical House 03 (HH03) is more or less an identical structure to HH04. Both were constructed during the 1930's. HH03 has been abandoned and is falling into disrepair.

This dwelling is a square structure which was constructed with clay bricks and which was fitted with a corrugated iron roof. HH03 was altered and renovated several times in the past. These alterations incorporate construction work with clay and cement bricks as well as with dolerite stone.



Figure 4- Historical House 03 is situated next to HH04 and is in a severely dilapidated condition (above).

6.2.4 Historical House 04

HH04 and HH03 are more or less identical dwellings which were constructed during the 1930's. HH04 has been abandoned and is falling into disrepair. It is a square structure which was constructed with clay bricks and which was fitted with a corrugated iron roof.

6.2.5 Farmstead complex 03

This farmstead complex is associated with a number of buildings. The main residence qualifies as a Historical House (HH05) and is associated with a rondavel which also has historical significance.

HH05 is a square dwelling with a pitched corrugated iron roof. A rondavel which was used as an additional bedroom or as a cool room is situated next to HH05.



Figure 5- HH05 and a rondavel (not visible on photo) qualify as historical significant structures in the northern part of the railway study area.

6.2.6 Farmstead complex 04

Historical House 06 (HH06) is situated in Farmstead Complex 04 which incorporates a number of structures. HH06 in this complex qualifies as a historical significant building. This building with its Cape Dutch gables probably dates from the Victorian or Edwardian period and is therefore older than sixty years.



Figure 6- Historical House 06 dates from the Victorian/Edwardian period and qualifies as a historical significant structure.

6.3 Graveyards

Eight graveyards were recorded in the railway study area. Their locations in relation with the alternatives for the railway alternatives are indicated in Figure 2.

6.3.1 Graveyard 01

This historical graveyard holds the remains of at least ten individuals. Most of the graves are decorated and fitted with tombstones. Inscriptions on two of the tombstones reflect the historical nature of this graveyard, namely:

- 'Stille rusplek van Gideon Andries Brenkman Geb 6 Jan 1917 Oorl 12 Jul 1936'
- 'In liefdevolle herinnering aan ons dierbare moeder Beatrix Jeanette Isabelle de Bruin Geb Janeke Geb 8-6-1878 Oorl 15-4-?? Ges 180 Vers 5 Rykaart'



Figure 7- Historical graveyard (GY01) on Onverwacht 265LS with ten graves belonging to colonials who settled near the transport road between Pretoria and Belfast during the late 19th century and the early part of the 20th century.

6.3.2 Graveyard 02

This informal graveyard next to the existing Pretoria – Witbank railway line holds the remains of at least five to six graves. All the graves are covered with piles of stone. None of the graves have any tombstones with inscriptions.

6.3.3 Graveyard 03

This historical graveyard is located on the northern shoulder of Road104. It may contain as many as eight graves. A few are fitted with headstones. Inscriptions on two of these read as follow:

- 'Hier rus ons lief seuntjie PDF van den Berg Geb 4-9-1929 Oorl 26-5-1932'
- 'Rus in vrede vader Matthues Thores Mey Geb 10-12-1871 Oorl 22-9-1944
moeder ? Catharina Mey (gebore Pretotrius) Geb 5-12-1861 Oorl 7-9-1944'



Figure 8- GY04 near Petrus Nkosi's home holds at least six unmarked graves.

6.3.4 Graveyard 04

GY04 is an informal graveyard with as many as six graves near the home of Peter Nkosi. All the graves are covered with piles of stone. None of the graves has any tombstones with inscriptions.

6.3.5 Graveyard 05

GY05 may hold as many as seven graves in a blue gum bush. At least three of the graves are fitted with cement headstones. One has the inscription 'Martha' on it.

6.3.6 Graveyard 06

This informal graveyard in a Blue Gum bush contains six graves which are edged with upright stones. None of the graves have any headstones with inscriptions.



Figure 9- GY06 in a Blue Gum bush holds six graves which are demarcated with upright stones.

6.3.7 Graveyard 07

This graveyard which is located in a Blue Gum bush on Onverwacht 562LS holds an unknown number of graves. Two of the graves which are visible are merely edged with upright stones. Both have been vandalised and are partly exhumed.

6.3.8 Graveyard 08

GY08 is located on a slight slope above a tributary of the Wilge Spruit. It is associated with remnants from the recent past which consist of low dolerite stone walls (some of which can be confused with graves). GY08 holds eight graves which are fitted with cement headstones. Some of the graves are edged with cement sides. GY08 is neatly demarcated with a dolerite wall. A large upright dolerite boulder (monolith) serves as an important beacon in the wall of the graveyard.



Figure 10- GY08 holds the remains of eight individuals and is demarcated with a dolerite wall (above).

Three of the graves bear the following decipherable inscriptions on the cement headstones:

- 'Mr Abram Mabena 4-10-67'
- 'Mrs Johanna Mabena'
- 'Evelyn Mabena'.

6.4 Dolerite structures (dwellings) with historical significance

At least four structures which were constructed with dolerite stone occur near GY03. It seems as if these remains may represent the outer boundary walls of homesteads which were probably built during the 20th century and qualify as historical remains as they are probably older than sixty years.



Figure 11- Dolerite structures which were probably used as dwellings by farm workers during the earlier part of the 20th century (above).



Figure 12- A square structure constructed with dolerite which were probably used as a cattle enclosure by farm workers during the earlier part of the 20th century or perhaps even earlier (above).

The structures comprise of the following:

- A rectangular constructed dolerite wall which may have served as a cattle kraal or which may have served as the outer boundary wall of a homestead.
- The foundation of a dilapidated dolerite structure which may have been a dwelling.
- A small square dilapidated dolerite structure which probably served as a dwelling.
- A second rectangular dolerite wall which incorporates two smaller structures, most probably dwellings. The rectangular dolerite wall probably served as the outer boundary wall of a homestead complex where a number of families lived together.

It is highly likely that these dolerite structures served as homesteads for farm workers who lived and worked on this part of the Eastern Highveld during the early decades of the 20th century.

Similar types of structures constructed with dolerite occur near GY08 but is not as elaborate as those north of the N4 and Road 104. It is possible that some of these structures, which include relatively neat and well preserved low stone walls, some of which are short, may be confused with graves.

However, it is not impossible that single, isolated undiscovered graves may occur in close proximity of these structures.

Table 1- Coordinates for historical structures in the proposed railway study area.

| Historical structures | Coordinates | Significance |
|--|-------------------------|---------------------|
| FC01. Historical House (HH01) in Farmstead Complex 01. | 25° 50.472' 28° 53.600' | MED-HIGH |
| FC02. Historical House (HH02) in Farmstead Complex 02. | 25° 50.364' 28° 53.382' | MED-HIGH |
| HH03. Isolated and abandoned dwelling. | 25° 50.256' 28° 53.173' | MED-HIGH |
| HH04. Isolated and abandoned dwelling. | 25° 50.262' 28° 53.221' | MED-HIGH |
| FC03. Historical House (HH05) with rondavel in Farmstead Complex 03. | 25° 51.885' 28° 52.247' | MED-HIGH |
| FC03. Historical House (HH06) in Farmstead Complex 04. | 25° 51.737' 28° 52.356' | MED-HIGH |

Table 2- Coordinates for graveyards in the proposed railway study area

| Graveyards | Coordinates | Significance |
|---|-------------------------|---------------------|
| GY01. Historical graveyard with approximately 10 graves. | 25° 50.391' 28° 53.372' | HIGH |
| GY02. Informal graveyard next to railway line. Approximately 5 or 6 children graves | 25° 50.386' 28° 53.563' | HIGH |
| GY03. Historical graveyard next to R104. Holds as many as 8 graves. | 25° 50.723' 28° 52.489' | HIGH |
| GY04. Informal graves at Petrus Nkosi's house | 25° 51.889' 28° 52.435' | HIGH |
| GY05. Informal graves in Blue Gum bush | 25° 52.187' 28° 52.485' | HIGH |
| GY06. Neat informal graveyard in Blue Gum bush | 25° 51.540' 28° 52.659' | HIGH |
| GY07. Two vandalised graves in a Blue Gum bush. | 25° 51.993' 28° 52.069' | HIGH |
| GY08. Neatly demarcated with dolerite wall. Holds eight graves and monolith | 25° 52.868' 28° 52.146' | HIGH |

Table 3- Coordinates for dolerite structures in the proposed railway study area.

| Dolerite structures | Coordinates | Significance |
|---|-------------------------|---------------------|
| <u>North of the N4 and R104</u> | | |
| DS01. A rectangular constructed dolerite wall | 25° 50.624' 28° 52.442' | MED-HIGH |
| DS02. The foundation of a dilapidated dolerite structure | 25° 50.628' 28° 52.450' | MED-HIGH |
| DS03. A small square dilapidated dolerite structure | 25° 50.629' 28° 52.469' | MED-HIGH |
| <u>Southern part of Project Area</u> | | |
| DS04. Dolerite structure with walls and square compartments | 25° 52.917' 28° 52.216' | MED-HIGH |
| DS05. Dolerite structure with walls and square compartments | 25° 52.936' 28° 52.237' | MED-HIGH |
| DS06. Dolerite structure with walls and square compartments | 25° 52.894' 28° 52.222' | MED-HIGH |

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

7.1 The significance of the heritage resources

The significance of the heritage resources is indicated by means of stipulations derived from the National Heritage Resources Act (No 25 of 1999) and specific criteria relating to each and every heritage resource that is evaluated.

7.1.1 Historical houses and dolerite structures

Historical structures older than sixty years or structures which are approaching this age are protected by Section 34 of the National Heritage Resources Act (No 25 of 1999). The significance of historical structures therefore has been indicated as Med-High (Tables 1 & 3).

However, the significance of each and every historical structure (house, outbuilding, etc) can further be scrutinised whenever these structures are to be affected by a development project and further studies need not be undertaken. Criteria according to which these structures can be evaluated include the following: the cultural-historical background of structures; their scientific or architectural value; their use in the field of tourism, museums or education as well as their aesthetic appearance; repeatability (scarcity), or their emotional (ideological) value.

7.1.2 Graveyards and graves

All graveyards in the railway line study area 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 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).

7.2 Possible impact on the heritage resources

Alternative 01, Alternative 02 and Alternative 03 follow the same route from the existing railway line to the N4. All three alternatives therefore may have an impact on the following heritage resources and graveyards, namely: HH02, HH03 and HH04 as well as GY01.

From the N4 to the point where Alternative 01 and Alternative 02 diverge (split) the following impacts may occur, namely:

- Alternative 01 with GY04 and GY06.
- Alternative 02 with GY04 and GY06.
- Alternative 03 with GY05 and perhaps with a lesser possibility with GY06.

It seems as if no heritage resources will be affected from where Alternative 01 and Alternative 02 diverge (split) to where the three alternatives end at the Kusile Power Station. However, caution must be given to the following:

- GY08 is located in the middle between Alternative 01 and Alternative 02.
- Inconspicuous, abandoned graves may occur where Alternative 01 and Alternative 03 converge as this area was occupied by communities who lived along the southern banks of the tributary that merges with the Wilge River further to the west.

All three alternatives therefore seem to have some risk with regard to possible impacts on historical structures and graveyards. However, it seems as if Alternative 03 may have the least impact on historical structures and graveyards between the N4 to the Kusile Power Station.

Alternative 03 therefore may be the preferred option for Eskom's proposed railway line from a heritage point of view. Linear development projects, such as the railway line, also provide the opportunity that the railway line may be deviated in order to avoid significant heritage sites such as large graveyards.

7.3 Mitigating the heritage resources

If any of the historical structures or graveyards may be affected by the proposed new railway line and associated infrastructure the following mitigation measures have to be applied to these historical structures and graveyards, namely:

7.3.1 Historical houses and dolerite structures

Historical houses may not be affected (demolished, renovated, altered) by the railway line project *prior* to their investigation by a historical architect in good standing with the South African Heritage Resources Agency (SAHRA). The historical architect has to acquire a permit from the South African Heritage Resources Authority (SAHRA) *prior* to any of these structures been affected or altered (demolished, renovated) as a result of the mining development project.

The dolerite structures have to be investigated by an archaeologist accredited with the Association for Southern African Professional Archaeologists (ASAPA) *prior* to their demolition by the railway line project. The archaeologist has to obtain a permit from the South African Heritage Resources Authority (SAHRA) and must document these structures before they may be affected by the railway line project.

7.3.2 Graveyards and graves

Graveyards and graves in the project area can be mitigated by following the following strategies, namely:

- Graveyards can be demarcated with brick walls or with fences when they are retained *in-situ* within 30m from the railway line or associated infrastructure.
- Graveyards can also be exhumed and relocated whenever they are located in the railway line corridors. 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.

8 CONCLUSION AND RECOMMENDATIONS

The Phase I Heritage Impact Assessment (HIA) study for the proposed railway study area revealed the following types and ranges of heritage resources as outlined in Section 38 of the National Heritage Resources Act, namely:

- Historical houses in farmstead complexes which are older than sixty years.
- At least eight graveyards.
- Dolerite structures (dwellings) with historical significance.

These heritage resources were geo-referenced and mapped (Figure 2; Tables 1-3).

The significance of the heritage resources is indicated (Tables 1-2) whilst mitigation measures are proposed for those historical structures and graveyards which may be affected by the proposed rail way line and associated infrastructure.

The significance of the heritage resources

The significance of the heritage resources is indicated by means of stipulations derived from the National Heritage Resources Act (No 25 of 1999) and specific criteria relating to each and every heritage resource that is evaluated.

Historical houses and dolerite structures

Historical structures older than sixty years or structures which are approaching this age are protected by Section 34 of the National Heritage Resources Act (No 25 of 1999). The significance of historical structures therefore has been indicated as Med-High (Tables 1 & 3).

However, the significance of each and every historical structure (house, outbuilding, etc) can further be scrutinised whenever these structures are to be affected by a

development project and further studies need not be undertaken. Criteria according to which these structures can be evaluated include the following: the cultural-historical background of structures; their scientific or architectural value; their use in the field of tourism, museums or education as well as their aesthetic appearance; repeatability (scarcity), or their emotional (ideological) value.

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 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).

Possible impact on the heritage resources

Alternative 01, Alternative 02 and Alternative 03 follow the same initial alignment on exiting the existing Pretoria – Witbank railway line to the N4. All three alternatives therefore may have an impact on the following heritage resources and graveyards, namely: HH02, HH03 and HH04 as well as GY01.

From the N4 to the point where Alternative 01 and Alternative 02 diverge (split) the following impacts may occur, namely:

- Alternative 01 with GY04 and GY06.
- Alternative 02 with GY04 and GY06.
- Alternative 03 with GY05 and perhaps with a lesser possibility with GY06.

It seems as if no heritage resources will be affected from where Alternative 01 and Alternative 02 diverge (split) and where the three alternatives end (Kusile Power Station).

All three alternatives therefore seem to have the same risk with regard to any possible impacts on historical structures and graveyards although Alternative 03 may have less an impact on historical structures and graveyards between the N4 to the Kusile Power Station than Alternative 01 or Alternative 02.

Alternative 03 therefore may be the preferred option for Eskom's proposed railway line from a heritage point of view.

Mitigating the heritage resources

If any of the historical structures or graveyards may be affected by the proposed new railway line and associated infrastructure the following mitigation measures have to be applied to these historical structures and graveyards, namely:

Historical structures

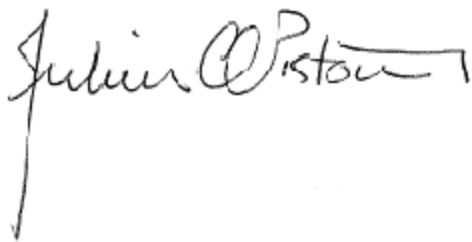
Historical houses may not be affected (demolished, renovated, altered) by the railway line project *prior* to their investigation by a historical architect in good standing with the South African Heritage Resources Agency (SAHRA). The historical architect has to acquire a permit from the South African Heritage Resources Authority (SAHRA) *prior* to any of these structures been affected or altered (demolished, renovated) as a result of the mining development project.

The dolerite structures have to be investigated by an archaeologist accredited with the Association for Southern African Professional Archaeologists (ASAPA) *prior* to their demolition by the railway line project. The archaeologist has to obtain a permit from the South African Heritage Resources Authority (SAHRA) and must document these structures before they may be affected by the railway line project.

Graveyards and graves

Graveyards and graves in the study area can be mitigated by following the following strategies, namely:

- Graveyards can be demarcated with brick walls or with fences when they are retained in-situ within 30m from the railway line or associated infrastructure..
- Graveyards can also be exhumed and relocated whenever they are located in the railway line corridors. 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.



DR JULIUS CC PISTORIUS

Archaeologist & Heritage Consultant

Member ASAPA

9 SELECT BIBLIOGRAPHY

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

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

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.

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. 2008. *A Phase I Heritage Impact Assessment (HIA) study for the proposed new Harmony South underground mine near Leandra on the Eastern Highveld in the Mpumalanga Province of South Africa.* Unpublished report prepared for Turgis Consulting and Harmony.

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

10 SPOKESPERSONS CONSULTED

Hans and Johan Coertze. Residents on Onverwacht 562LR

Petrus Nkosi. Farm worker on Onverwacht 562LS

Jaques Nel. Resident on Onverwacht 562LS

Jean van Vuuren. Resident on Onverwacht 562LS

Mr. and Mrs. Venter. Residents on Onverwacht 562LS

Polina Bashaia. Farm worker on Onverwacht 562LR