Prepared for:

PBA INTERNATIONAL

ESKOM MEGAWATT PARK

A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR ESKOM'S PROPOSED NEW 6X765kV POWER LINES RUNNING FROM THE DELTA SUBSTATION IN LEPHALALE TO THE EPSILON SUBSTATION IN THE GAUTENG PROVICE OF SOUTH AFRICA

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APPENDIX II-5

HERITAGE IMPACT ASSESSMENT REPORT

EXECUTIVE SUMMARY

Eskom intends to construct 6X765kV power lines running between the Delta Substation in Lephalale in the Limpopo Province to the Epsilon Substation near Klerksdorp in the North-West Province of South Africa. Consequently, Eskom wants to compile an EIA based on legal requirements, company guidelines and protocols for its proposed new power lines. The Delta Epsilon Project may have an impact on any of the types and ranges of heritage resources (the 'national estate', as outlined in Section 3 of the National Heritage Resources Act [No 25 of 1999]) that may occur in the Eskom Project Area. Consequently, a Phase I Heritage Impact Assessment (HIA) study for Eskom's proposed Delta Epsilon power lines was undertaken according to Section 38 of the National Heritage Resources Act (No 25 of 1999).

The aims with this Phase I HIA study were the following:

- To establish whether any of the types and ranges of heritage resources ('national estate') as outlined in Section 3 of the National Heritage Resources Act (Act 25 of 1999) (see Box 1) do occur in/near the preferred power line corridors (Eskom Project Area).
- To determine the nature, the extent and the significance of these heritage resources and whether these remains will be affected by the Eskom Project.
- To evaluate what appropriate mitigation measures could be implemented to reduce the impact of the proposed development on these heritage resources.

The Phase I HIA study revealed the presence of the following types and ranges of heritage resources in/near the preferred power line corridors and deviations, namely (Table 8):

- As many as six Late Iron Age stone walled sites on Veeplaats 82 (1), Kromellenbogen 104 (2), Kleinfontein 260 (2) and Rhenosterfontein (1) between Zeerust (west) and Groot Marico (east).
- A monument commemorating the Battle of Kleinfontein (24 October 1902) on Kleinfontein 260.
- An unknown number of farmsteads in the southern part of the Eskom Project Area, particularly near Koster and Derby.
- Five Late Iron Age sites on Leamington 10 (2), Wegdraai 18 (1) and Elysium 395 (2) while another four occur on Inkerman 10 (1), Springbokvlei 55 (1) and Zandfontein 394 (2) on both sides of the Matlabas River. A mining heritage site also occurs on Zandfontein 392.

- The Battle of Moedwil (19 September 1901) occurred in a wide area to the north of Moedwil (N4), between Swartruggens (west) and Moedwil (east).
- A mining heritage site on Sweet Home 322.
- No Go Areas occur on Boekenhoutfontein 260 (former residences of Paul Kruger) and Selonskraal 317JQ (mega stone walled complex, Molokwane).
- The Battle of Vlakfontein (29 May 1901) occurred on the farm Vlakfontein 373, near Derby.

It is also possible that the following types and ranges of heritage resources may occur in/near the proposed power line corridors and deviations, namely (Table 8):

- Stone Age sites with scatters of stone tools may occur along the Crocodile, Marico, Matlabas, Toelani and other rives, near confluences of rivers and streams, erodod areas, dongas and outcrops suitable for tool manufacturing.
- Some of the unknown number of farmsteads in the power line corridors that runs in the southern zone of the Eskom Project Area may hold historical significance. These farmsteads occur in bigger concentrations near Koster and Derby.
- The Marico Bushveld FU Deviation runs along and near the Toelani River where undiscovered sites holding evidence for the historical unfolding of the Late Iron Age/historical Tlokwa may occur.
- Deviation D1 and Corridor F runs across the former sphere of influence of the Kwena Phalane (Ramakokskraal and wider area) where undiscovered sites of this Late Iron Age/historical clan may exist.
- Undetected graveyards may occur in the central and southern parts of the preferred power line corridors and deviations.
- The farm Mabulskop 406 may hold Late Iron Age or historical remains as this kopje may be associated with a ruler from the more recent past (Mabul?).

The significance of the heritage resources

The significance of the heritage resources which will be affected by the Eskom Project can only be determined after they have been positively identified after the walk-through study has been done and after the realignment of the power lines have occurred as some of these heritage resources may either be avoided by the power lines or may continue to exist (unaffected) in the power line corridors.

The level of significance of each heritage resource will determine what mitigation measures have to be followed before this heritage resource may be affected by the Eskom Project. The nature and extent of the mitigtion measures will again determine the permitting process that has to be followed with the South African Heritage Resources Authority (SAHRA).

The protective status of the various types and ranges of heritage resources that may be affected by the Eskom Project is indicated by means of various sections of the National Heritage Resources Act (No 25 of 1999).

Stone Age sites

A limited number of Stone Age sites have been identified in the Eskom Project Area and none in the proposed power line corridors. This is primarily the result of the fact that few surveys for Stone Age sites have been conducted in the Eskom Project Area. Stone Age sites are also not easy to detect as they may be (partly) buried under the ground and mostly consist of stone tools that are scattered across the surface of the land.

It is clear that Stone Age sites are under represented in the Eskom Project Area and that some of these sites will be found during the walk through study or when the power line corridors are surveyed and constructed.

Rock painting and engravings sites are also rare in the Eskom Project Area. It seems as if none exist in any of the proposed power line corridors and deviations.

Stone Age sites qualify as archaeological remains and are protected by Section 38 of the National Heritage Resources Act (No 25 of 1999).

Stone walled settlements

Most of the Late Iron Age stone walled sites in the Eskom Project Area have been identified in the central part of the project area where they overlap with Sotho-Tswana and Nguni prehistory and history. A number of these sites may be affected by the proposed power line corridors and their deviations .

The No Go Area of Molokwane occur in/near Corridor D, whilst Corridor F skirts the corner of Selonskraal 317, some distance away from Molokwane.

Stone walled sites qualify as archaeological and historical remains and are protected by Section 38 of the National Heritage Resources Act (No 25 of 1999).

Historical structures

A substantial number of farmsteads have been recorded in the southern part of the Eskom Project Area. A number of these structures occur in the proposed power line corridors, particularly near Koster and Derby. However, it is not clear whether all of these farmsteads, which have been identified from maps and Google imagery and not by means of field observations, do in fact qualify as historical structures. It is not certain whether these infrastructure consists of single or more than one structure, whether they are older than sixty years (historical buildings), in what condition they are (altered, renovated, dilapidated), etc. These and other criteria will determine their level of significance. It is possible that some of these infrastructure may include farmsteads with outbuildings, e.g. wagon sheds, rondavels and graveyards which may constitute cultural landscapes of smaller proportions.

The No Go Area of Boekenhoutfontein 260 occur in/near Corridor D.

Historical structures such as individual houses or farmsteads with outbuildings (sometimes constituting cultural landscapes) which are older than sixty years are protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999).

Memorabilia (including battlefields)

A number of monuments and battlefields were distinguished in and near the border of the Eskom Project Area. At least two battlefields (Moedwil and Vlakfontein) as well as the Battlefield of Kleinfontein (24 October 1902) and the monument erected to commemorate this battle occur in the proposed power line corridors and their deviations.

Memorabilia which include monuments, commemorative beacons or Gardens of Remembrance qualify as a heritage memorials which are protected by Section 37 of the National Heritage Resources Act (No 25 of 1999).

Graveyards

The number of graveyards which were recorded in the Eskom Project Area as well as in the preferred power line corridors (none) is not a true reflection of the real number of graveyards which exist in the Project Area. A number of undetected graveyards may be affected by the

Eskom Project as many informal or abandoned graveyards are difficult to detect. Formal, historical graveyards usually occur where colonial settlement took place, such as in the central and southern parts of the Eskom Project Area. It is highly likely that graveyards will be discovered during the walk-through study.

All graveyards and graves can be considered to be of high significance and are protected by various laws. 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 impacts on the heritage resources

Some of the types and ranges of heritage resources in the preferred power line corridors may be impacted (affected, altered, damaged) by the Eskom Project.

The number which may be affected may decrease when the power lines have been realigned after the walk-through study has been completed. The significance of the impacts on the various types and ranges of heritage resources is indicated in Tables 11-15).

Stone Age sites

Stone Age sites generally do not cover large surface areas and can be expected to occur nearly anywhere. No Stone Age sites were recorded along the proposed power line corridors. However, sites will be found when the walk through study is done or when the power line corridors are surveyed and the power lines are constructed. These sites may be impacted when pylons are constructed on top of concentrations of stone artefacts.

Stone tools are not destroyed by this action but are scattered and are disturbed, usually from a context which already have been disturbed by means of natural environmental circumstances that occurred in the past. The disturbance which will be caused by the Eskom Project, however, will be due to human intervention and can not be considered to be a natural process.

Stone walled settlements

Stone walled settlements occur as single sites or as clusters of sites. These sites are allways found in areas where low mountains and hills occur as stone were used as the prime source of building material. However, anomolies may occur such as the site of Marathodi on Vlakfontein 209 which was constructed on level land near low outcropping dolerite dykes. The surface of land that is covered by single (clusters) of stone walled sites vary considerably. Some single sites are large and cover several hectares of land. Clustered compositions of these sites cover several square kilometres and have been identified as the No Go Areas. These sites constitute towns and villages (cultural landscapes and townscapes) and must be avoided at all costs.

A number of stone walled sites occur in the proposed power line corridors. These sites may be impacted if the pylons for the power lines are erected within the perimeters of these sites or when the power lines cuts across or between a cluster of these sites which together may constitute a cultural landscape.

The No Go Area of Molokwane occur in/near Corridor D. Corridor F skirts the corner of Selonskraal on which this stone walled complex is located but needs not to affect the site.

Historical structures

A number of farmsteads, some with associated infrastructure, have been identified in the southern part of the proposed power line corridors, particularly near Koster and Derby. Newly planned power lines are usually designed in such a way as to avoid existing infrastructure. However, when power lines are grouped together such broad corridors may require that historical buildings or part of complexes with historical structures (constituting cultural landscapes) have to be demolished to make way for power lines.

The No Go Area of Boekenhoutfontein 260 occur in/near Corridor D.

Memorabilia (including battlefields)

Battlefields associated with the Transvaal Anglo War (1899-1902) are not neccessarily demarcated areas. Battles that have been fought during this war took place on horse-back and moved across wide areas. Strongholds usually consisted of trenches or rudimentary low stone walls that are not recogniseable any longer. Skirmishes mostly occurred over a period of a few days so that remains of base camps can seldom be found. The most outstanding

cultural and historical feature of some battlefields may lay in their intangible heritage attributes.

It seems as if the battlefield where the Battle of Kleinfontein (24 October 1902) took place and the monument commemorating this battle as well as the Battlefields of Moedwil (19 September 1901) and Vlakfontein (29 May 19010 may be crossed by Corridors Ab, Corridors C B2 and C B3 and Corridors D and F.

Graveyards

Graveyards were recorded in the Eskom Project Area and in the proposed power line corridors. More may be discovered during the walk-through study. These graveyards may be impacted when pylons are erected on top of these structures.

Mitigating the heritage resources

Different mitigation measures have to be followed for different types and ranges of heritage resources that may be affected by the Eskom Project. Mitigation measures for various types and ranges of heritage resources are usually conducted by specialists qualified in various disciplines and accredited with the Association for Southern African Professional Archaeologists (ASAPA).

An important aspect relating to the mitigation (conservation) of heritage resources in power line corridors is the undertaking of walk-through studies for proposed power line corridors. Walk-through studies are done before power lines are constructed and have the following benefits, namely:

- Power lines can be rerouted or realigned in order to avoid (conserve) heritage sites.
- Heritage resources can be conserved unaffected (*in situ*, underneath) power lines and can subsequently be managed as long as power lines are operational.

Stone Age sites

Stone Age sites can in some instances be avoided by means of placing pylons on opposite ends (outer perimeters) of these sites. Stone Age sites therefore can be kept underneath (*in situ*) any number of power lines.

It is also possible that stone tools which may be affected by the Eskom Project can be collected from the surface before the power lines are constructed. These stone tools can be donated to

museums (preferably closest to the project area) or to an accredited institution such as a national museum or a university. Here, it can be safe-kept and be used in displays or in educational programmes.

These Phase II investigations can only be conducted by archaeologists accredited with the Association for Southern African Professional Archaeologists (ASAPA). The archaeologist has to obtain a permit from the South African Heritage Resources Authority (SAHRA) which will authorise the collection of the artefacts *prior* to the construction of the power lines and the subsequent destruction of the archaeological sites.

Stone walled settlements

Stone walled sites can in some instances be avoided by means of placing pylons on opposite ends (outer perimeters) of single or small clusters of stone walled sites. Incorporation of a small cluster of stone walled sites underneath any number of power lines may impact on these cultural landscapes. However, the impact will be visual and not neccessarly physical. No fixed prescriptions exist for 'safe distances' that has to be maintained between power lines and stone walled sites.

The No Go Area of Molokwane in/near Corridor D must be avoided by the power lines in order not to impact physically or visually on this heritage site of outstanding significance.

If stone walls have to be destroyed to make way for pylons these stone walled sites must be subjected to Phase II investigations. These investigations require that stone walls sites be documented by means of mapping the sites and possibly by means of small test excavations of sites. Phase II investigations are done by archaeologists accredited with ASAPA. The archaeologist has to obtain the necessary permit from SAHRA which will authorise the Phase II investigation and subsequent destruction of the stone walled sites before the construction of the power lines commences.

Historical structures

Historical structures such as farmsteads with associated infrastructure and cultural landscapes can in some instances be avoided by means of routing power lines around these structures. Historical infrastructure, however, can not be preserved underneath power lines. Broad power line corridors may be negative to historical farmstead complexes which constitute cultural landscapes of smaller or larger proportions.

Power lines that avoid historical structures may still impact visually on these remains. No fixed prescriptions exist that outline 'safe distances' between power lines and historical structures.

The No Go Area of Boekenhoutfontein 260 in/near Corridor D must be avoided by the power lines in order not to impact physically or visually on this heritage sites of outstanding significance.

Historical structures may not be affected (demolished, renovated, altered) by the Eskom Project *prior* to their investigation by a historical architect in good standing with SAHRA. The historical architect has to acquire a permit from SAHRA before any historical structures may be impacted as a result of the Eskom Project.

Memorabilia (including battlefields)

The monument that is associated with the Battle of Kleinfontein (24 October 1902) must preferably be avoided by the Eskom Project. If the monument, which can also be conserved beneath the power line, has to be moved it must be shifted to a location where it is accessible to the public, tourists and other interested individuals or groups as its holds educational, emotional and other values.

The Battlefields of Moedwil and Vlakfontein merely have intangible heritage value. They are not clearly demarcated and has already been affected by farming activities and development in general.

Graveyards

Graves and graveyards in the Eskom Project Area can be mitigated by following one of the following strategies, namely:

- Graveyards and graves can be conserved *in situ* beneath power lines. Pylons should be erected on opposite ends of graves or graveyards. Consequently, power lines can be strung across and above graves and graveyards. Conserving graves and graveyards in power line corridors create the risk that they may be damaged, accidentally, and that Eskom may be held responsible for such damages. Controlled access must exist for any relatives or friends who wish to visit graves or graveyards in power line corridors.

- Graveyards can also be exhumed and relocated. 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.

Ranking of power line corridors

Before mitigation

Corridors C B2, C B3, the Bushveld Deviation and Deviation D2 are most preferred as it seems as if these corridors will affect a low number of heritage resources, no outstanding significant heritage resources as well as no No Go Areas (Marathodi is located a considerable distance to the east of C B2 and C B3).

The Marico Bushveld FU Deviation is medium preferred as it possibly runs across a Late Iron Age/historical Tlokwa sphere of influence which may be located along the Toelani River.

Corridor F and Deviation D1 is medium preferred as it possibly runs across a Late Iron Age/historical Kwena Phalane sphere of influence (Ramakokskraal and wider area) where undiscovered sites of this Late Iron Age/historical clan may exist.

Corridor D is least preferred as it runs close to No Go Areas such as Boekenhoutfontein and Selonskraal (Molokwane).

Corridor Ba is least preferred. Corridor Ba runs through the historical Zeerust/Marico area as was well as across a Late Iron Age/historical Hurutshe sphere of influence affecting several of these sites. The battlefield of Kleinfontein and the memorial commemorating this battle also occur in/near Corridor Ba.

After mitigation

After mitigation measures have been applied to heritage resources that may be affected by the power lines the power line corridor and deviations can be ranked as follow:

Corridors C B2, C B3, the Bushveld Deviation and Deviation D1 are the most preferred as the few and less significant heritage resources in/near these power line corridors and deviations can be mitigated.

The Marico Bushveld FU Deviation, Corridor F and Deviation D1 are most preferred if the Late Iron Age/historical Tlokwa and Kwena Phalane spheres of influence in/near these corridors and deviations do not proof to be as significant as historical evidence suggest, or if sites belonging to these spheres of influence are limited and mostly falling outside the power line corridors and when the sites which may be affected by the power lines and deviations are limited in numbers and after they have been mitigated.

Corridor D is medium preferred if the power lines can avoid the No Go Areas on Boekenhoutfontein and Selonskraal. Avoidance of these No Go Areas must ensure that these heritage resources are not physically or visually impacted by the power lines.

Corridors Ba is medium preferred if the power lines in this corridor avoid sites belonging to a Late Iron Age/historical Hurutshe sphere of influence or if the sites that may be affected by the power lines are limited in numbers and after they have been mitigated. The battlefield of Kleinfontein remains an intangible heritage feature while the memorial commemorating this battle must be left *in situ* or have to be moved.

Impacts of power lines on heritage resources

Two main types of impacts can be distinguished with regard to heritage resources and power lines, namely:

- Physical impacts which occur when pylons are constructed on top of heritage resources which exist on the surface of the earth..
- Visual impacts occur when power line infrastructure affects the aesthetic and visual appearance, sense of place, context, or other aspects relating to heritage resources in a negative way.

The significance of impact of power lines on heritage resources vary if single power lines are kept in a corridor or when a varying number of power lines are grouped together in a single corridor creating increasing wider corridors filled with more than one power line as well as many pylons that have to carry these power lines.

The higher the number of pylons in a power line corridor the higher the physical impact of the footprints of the pylons on the earth will be. More than one power line grouped together are visually more discernable than a single power line and should cause a higher visual impact.

The positive and negative impacts of three types of power line corridors (narrow, one or two power lines), medium (three power lines) and broad power line corridors (six power lines) are outlined in Table 1.

The positive and negative impacts of three types of power line corridors (narrow, one or two power lines), medium (three power lines) and broad power line corridors (six power lines) are outlined in Table 1.

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1 INTRODUCTION

Eskom needs to construct new generation plants which will be linked with the National Grid *via* transmission power lines and substation as a result of the growing electricity demand in South Africa. Eskom's power station near Lephalale (Matimba B 4200MV [Medupi]) and an independent power producer's power station (Mmamabula 3600MV) in Botswana have been identified as solutions to the power deficit. The Waterberg and Mmamabula coal fields will supply these power stations. More than seventy percent of the power to be generated at Mmamabula power station will be exported to South Africa *via* the Eskom Transmission Grid.

Eskom has optimised the design of the network to evacuate power from these substations by establishing vital nodes. The first of these is the Delta Substation to be used to step up 400kV to 765kV for bulk transmission with a minimum number of transmission power lines. Delta will be located near Medupi. A second substation will be established near Potchefstroom, namely Epsilon. Epsilon Substation is needed to establish a step down node of 765kV to 400kV. This will be linked to the existing 400kV network that will be developed to the south.

To meet the above criteria the following transmission power lines and substations are required:

- 2X400kV Matimba B (Medupi) Dinaledi transmission power lines (*via)* Spitskop.
- 1X400kV Matimba B (Medupi) Marang transmission power lines.
- Delta 400/765kV 2000 MVA Substation.
- 4X4000kV Mmamabula Delta transmission power lines.
- 6X765kV Delta Epsilon (Masa Selomo) transmission power lines.
- Epsilon 765/400kV 200 MVA Substation.

This report focussed on the results obtained for a Phase I Heritage Impact Assessment study for the 6X765kV Delta Epsilon power lines. This project is referred to as the Eskom Project and the proposed new power line corridors as the Eskom Project Area.

2 AIMS WITH THIS REPORT

Eskom intends to construct 6X765kV power lines from the Delta Substation near Lephalale in the Limpopo Province to the proposed new Epsilon Substation near Potchefstroom in the North-West Province of South Africa. The proposed Delta Epsilon Project (Masa Selomo Project) (hereafter referred to as the Eskom Project) may impact on any of the types and ranges of heritage resources that are distinguished in Section 3 of the National Heritage Resources Act (No 25 of 1999) and which may exist in/near the proposed power line corridors (Eskom Project Area) (see Box 1).

PBA International, the company (in association with Margen Industrial Services, the lead consultant) responsible for compiling an Environmental Impact Assessment (EIA) report for the Eskom Project, therefore commissioned the author to conduct a Phase I Heritage Impact Assessment (HIA) study as required by Section 38 of the National Heritage Resources Act (No 25 of 1999) for the Eskom Project Area in order to obtain an understanding of the heritage character of this vast area. The knowledge base regarding the presence and significance of heritage resources in the Eskom Project Area will enable Eskom to take pro-active measures with regard to any heritage resources that may be affected by the Eskom Project.

The aims with this Phase I HIA study were the following:

- To establish whether any of the types and ranges of heritage resources ('national estate') as outlined in Section 3 of the National Heritage Resources Act (Act 25 of 1999) (see Box 1) do occur in/near the preferred power line corridors (Eskom Project Area).
- To determine the nature, the extent and the significance of these heritage resources and whether these remains will be affected by the Eskom Project.
- To evaluate what appropriate mitigation measures could be implemented to reduce the impact of the proposed development on these heritage resources.

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, 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 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

3 APPROACH AND METHODOLOGY

The approach that was followed to obtain information for this Phase I HIA study for the Eskom Project was based on the following methodology. Information with regard to the heritage character of the Eskom Project Area was obtained from the following sources and by means of the following activities:

- Consulting archaeological (heritage) data bases.
- Consulting relevant literature regading the pre-history and history of the Eskom Project Area.
- Utilizing standard governmental maps to compile heritage sensitivity and detailled heritage maps to meet the aims with this report
- Synthesysing the results derived from fieldwork done by different researchers over a period of time in the Eskom Project Area.
- Consulting spokespersons in order to discover, identify and to map heritage sites in the Eskom Project Area.
- Geo-referencing and mapping known heritage resources and sites on a heritage map.
- Using information derived from Google imagery and helicopter fly-overs that were added to the bulk of the heritage data that was collected by means of the methods outlined above.

3.1 Databases

Databases housed and maintained at institutions such as the South African Heritage Resources Agency (SAHRA) in Cape Town and in the Limpopo and North-West Provinces were consulted in order to establish the presence of any significant types and ranges of heritage resources in the Eskom Project Area.

The Archaeological Data Recording Centre housed at the National Flagship Institute (Museum Africa) in Pretoria was also consulted to determine whether any heritage resources of significance had been identified during earlier surveys in the Eskom Project Area.

3.2 Literature survey

Literature relating to the pre-historical and historical unfolding of the Eskom Project Area was briefly reviewed. These incuded academic text books; research articles; post-graduate studies; ethnographic literature; encyclopedia and historical atlasses.

Research articles and post-graduate studies provided information on surveys and excavations in the region whilst ethnographic literature outlined the origins and settlement history of Late Iron Age Sotho-Tswana and Nguni clans as well as historical groups who occupied the Eskom Project Area. A historical atlas illuminated the most important events and occurrences in the region on a geographical scale. Literature on battles, battlefields and military fortifications provided indications of the major battles, battlefields and fortifications which exist in the region. The background and historical unfolding of individual towns in the Eskom Project Area is outlined in encyclopedia, travel journals and historical atlasses.

This literary review contextualised the region in a pre-historical, historical, cultural, ethnographic and economic context which was necessary to gain an understanding of the meaning and significance of the heritage character of the Eskom Project Area (See Part 5, 'The heritage potential of the Eskom Project Area' and Part 9, 'Select bibliography').

3.3 Maps

Two kinds of maps were used in this project, namely standard maps that are provided by the governmental printer and maps that were compiled to meet the aims of this report.

The following governmental maps were used in this study, namely:

- A set consisting of twenty-eight 1:50 000 topographical maps which outline the full extent of the Eskom Project Area.

- Three maps of the 1: 250 000 series on which the Eskom Project Area is demarcated.

These standard maps were used to study the physiographical character of the Eskom Project Area. Close interactions do occur between topographical and ecological features of landscapes and the heritage characteristics of regions which differ from each other with regard to climatic circumstances and natural features. The morphological attributes and knowledge about the heritage character (status) of the Eskom Project Area were then used to compile maps which outlined the sensitivity of the Eskom Project Area with regard to heritage reources. (The sensitivity of the Eskom Project Area was graded in five levels: low; medium–low; medium; medium-high; high. No Go Areas represent heritage areas with the higherst level of significance).

The three maps that were compiled were the following:

- A heritage sensitivity map which was based on the presence of possible (assumed) and known types and ranges of heritage resources. It was called the pre-mitigation heritage sensitivity map.
- A post-mitigation heritage sensitivity map which outlined the level of sensitivity of heritage resources in the Eskom Project Area after mitigation measures have been implemented for those types and ranges of heritage resources that may be affected (damaged, moved, altered) by the Eskom Project.
- Finally, a detailled heritage map was compiled which indicated all the known types and ranges of heritage resources which exist in the Eskom Project Area. This map was compiled by means of plotting the coordinates of heritage sites that were geo-referenced over the years, whose coordinates are kept in data bases as well as newly discovered heritage resources whose coordinates were captured during the project. Heritage resources whose coordinates were not known were geo-referenced according to locational descriptions such as farm names on which they occur and which are derived from literary sources.

The pre-mitigation and post-mitigation heritage sensitivity maps are not published in this report. The detailled heritage maps appears as Figure 8 in this report.

3.4 Fieldwork

The Eskom Project Area covers a surface area of approximately 80 000km². This area is too large to be covered by means of a systematically planned archaeological reconnaissance considering the time frames allowed for this project. Fieldwork were conducted by means of surveys with vehicles, reconnaissance on foot and helicopter fly-overs of the Eskom Project.

Fieldwork in the Eskom Project Area was undertaken by various researches over a period of time as well as by the author of this report. Each is briefly summarised below.

- Fieldwork across the Eskom Project Area was done by different specialists during the past three to four decades covering disciplines such as the pre-history and history of the region.
- Fieldwork was done during the scoping phase for the Eskom Project in order to become familiarized with the region and to identify critically important sites such as No Go Areas.
- Fieldwork was undertaken after the preferred routes for the power line have been identified. This narrowed down fieldwork became more focussed as possible impacts between heritage resources and power lines now could be established with a greater degree of certainty and accuracy.
- The author does fieldwork for Eskom's rural power line project across the Eskom Project Area since 2003.

Fieldwork done by researchers during the past three to four decades in the Eskom Project Area focussed on the Stone Age, Iron Age, rock art, ethography, ethno-history, cultural history and history of the region. Whilst work on the Stone Age and rock art has primarily been done in the northern part, more focussed Iron Age reasearch has been done in the central part of the Eskom Project Area. Historical, ethnographic and cultural historical research has been done in all three zones of the

Eskom Project Area with more emphasis on these disciplines in the central and southern parts of the Eskom Project Area. The author did extensive research in the central part of Eskom Project Area some years ago and focussed on Late Iron Age and historical sites while becomming more involved in the northern part with heritage impact assesment studies during the more recent past.

During the scoping phase for the Eskom Project fieldwork was undertaken in the Eskom Project Area to familiarize the author with the heritage character of the three zones. After the preferred routes for the power line corriodrs were identified sensitive stretches along all the preferred power line corridors were investigated. Heritage resources identifierd during the literature survey and during the helicopter fly-overs were confirmed by means of spot checks in the veldt.

The author did extensive surveys for Eskom's rural power line project across the Eskom Project Area and covered parts of as many as sixty farms in the northern, central and southern part of the project area since 2003. Although these surveys did not cover the entire surfaces of these farms the Eskom rural power line project revealed much about the heritage character of the Eskom Project Area (see Part 9, 'Select Bibliography').

3.5 Spokespersons

Spokespersons such as farmers, farm workers, herdboys and tribal leaders were consulted over the years in order to establish the location and identity of heritage sites. This was particularly the case for Late Iron Age and historical sites in the Hurutshe's sphere of influence between Zeerust and Groot Marico; the previous domains of the Kwena Modimosana clans who lived west of the Magaliesberg and the Kgatla Kgafela's territory north of the Pilanesberg.

Information was also collected during the public participation process from interested and infected parties who made the presence of heritage sites on their properties known to the environmental team.

Many of the spokespersons consulted years ago are no longer known or have deceased. The list of spokespersons included in this report merely refers to spokespersons that were consulted during surveys done in the more recent past (see Part 10, 'Spokespersons consulted').

3.6 Other sources utilized

Aerial photograpghy and Google imagery are useful to detect heritage sites but only when these sites are exceptionally large, such as some stone walled settlements that edte from the Late Iron Age. The presence of stone walled sites which particularly occur in large concentrations in the central part of the Eskom Project Area has been documented quite extensively by means of archaeological surveys in the past. However, numerous small, scattered stone walled sites still remain undetected between main centres such as Swartruggens, Rustenburg, Groot Marico and Zeerust as revealed by Google imagery.

Infrastructure such as farmstead were also identified with Google imagery and with maps. However, these buildings cannot be accurately identified as being of historical significance. This can only be achieved by means of first hand field observations of each and every structure in such a complex.

At least two helicopter fly-overs of the Eskom Project Area was undertaken during 2007 and 2008. These fly-overs confirmed what carthographic evidence and observations in the project area suggested, namely that the Eskom Project Area was composed of three physiographic zones and that each of these zones can be linked with certain dominant types and ranges of heritage resources.

3.7 Some remarks on terminology

Terminology that may be used in this report is outlined in Box 2 (below, next page).

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 project area, to the first appearance or use of 'modern' Western writing brought to the Mokopane (Potgietersrust) area by the first Colonists who settled here 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 'Late Iron Age' refers to the period between the 17th 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 'project 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.

4 ASSUMPTIONS AND LIMITATIONS

4.1 Lack of research and data

The tempo and frequency of archaeological research in the Eskom Project Area is disappointing and explains the lack of heritage data and information gaps in this part of the country. Large parts of the Eskom Project Area has never been subjected to any heritage impact assessment studies neither to any dedicated archaeological surveys. Most of the heritage data available for the central part of the Eskom Project area and in an increasing tempo for the northern part of the project area is derived from heritage impact assesment studies. Whilst the central part of the Eskom Project Area serves as the mining hub of the country, the northern part is becoming a new energy creating nucleus. Consequently, many heritage impact assesment studies are done in these two areas while the southern part primarlily remains an unchanged agricultural enterprise with some gold mines on its southern perimter.

Areas rich in heritage sites which have not received any research attention in the Eskom Project area are numerous. Only a few are mentioned, e.g. the drainage basin of the Toelani River running northwards towards the Marico River; the Plateberg (Thabeng) environment north and west of Klerksdorp; the area north of the Pilanesberg; the Swartwitpensfontein mountain range around Ramakokastad; the floodplains of major river courses such as the Matlabas, Elands, Marico, Crocodile and Limpopo Rivers and the confluences of these major rivers with numerous small streams where hundreds and perhaps thousands of undiscovered pre-historical and historical settlements await discovery.

4.2 Information gaps

Although this project gained an understanding of the heritage character of the Eskom Project Area it could not establish the full extent of all the types and ranges of heritage resources that may be present in the area considering its size and extent. The Eskom Project was also subjected to time frames within which specialists studies had to be completed and which did not neccessarily considered the

approaches and methodological requirements attached to the various disciplines involved with this project. Gaps therefore do exist with regard to the current heritage knowlege base for the Eskom Project Area. These information gaps can only be filled by means of rigorous and extended periods of fieldwork covering whole of the Eskom Project Area and which is supported with in-depth literature research. Such an approach is the backbone of most scientific archaeological research programmes and not neccessarily of all heritage impact assessment studies.

However, it is felt that the understanding which has been gained about the heritage character of the Eskom Project Area is sufficient to make recommendations regarding the placement of Eskom's proposed power line corridors in such a way that outstanding significant heritage sites, such as No Go Areas, can be avoided. Mitigation measures can also be implemeneted for heritage sites which may be affected by the Eskom Project before the project takes affect or which are discovered during walk-through studies which are undertaken before construction of power lines commences or which are discovered during the implementation of the Eskom Project. Mitigation measures for all types and ranges of heritage resources do exist. Power line projects also offer opportunities and advantages for the unaffected future existence and conservation of heritage sites which otherwise may have been destroyed by more drastic development projects such as mining and town developments schemes.

4.3 Undiscovered heritage resources

The vast surface area covered by the Eskom Project Area made it impossible to subject this region to a well planned and executed archaeological reconnaissance program which is usually part and parcel of long-term archaeological projects. Such programmes are undertaken by teams of specialists stretching over prolonged periods of time, sometimes years, and which allow for surveys and excavations to correspond with seasons when receded vegetation covers allows for higher visibility of archaeological remains. Survey and excavations are followed with periods during which fieldwork results could be processed and analysed.

However, the combination of desktop work; fieldwork conducted by other researchers and the author over a long period of time; the compilation of maps; consultation with spokespersons; Google imagery in conjunction with maps and helicopter fly-overs enabled the author to obtain a grasp of the heritage character and features of the region.

This current heritage knowledge base about the Eskom Project Area, however, does acknowledges the fact that heritage sites (tangible and intangible), graveyards and other features, structures and occurrences of heritage significance, inside or near the proposed power line corridors, may have been missed by this study.

4.4 Chance finds

Heritage resources can be found in the most unexpected places. While some remains may simply be missed during surveys others may occur below the surface of the earth and may only be exposed once the Eskom Project commences. Consequently, when chance finds of heritage resources are made during the Eskom Project, the South African Heritage Resources Agency (SAHRA) should be notified immediately, all construction 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.

4.5 Confidentiality

In order to ensure that the unaffected integrity of all heritage resources and sites which have been mapped and which are discussed in this report is maintained, no coordinates for sites are published in this report.

4.6 Heritage resources and power lines

It is generally assumed that impacts caused by linear developments such as power lines on heritage sites may be less severe than impacts which occur as a result of more drastic kinds of development such as mining, town development or dam

building where major affects on the environment (inculding heritage resources which equal the man-made environment) are brought about.

This assumption can be explained by the fact that long, narrow power lines which extend across short, medium or long distances offer opportunities with regard to the conservation of heritage sites, namely:

- Power lines are strung on top of pylons which represent the only footprints that are left after power lines have been constructed. Pylons therefore impact physically on heritage sites which occur on ground level when excavations for these structures occur (not considering maintenance activities which also occur along the power line corridors).
- Power lines hang above the surface on the land in which heritage sites were deposited many years ago and merely cause a visual impact on these sites if heriatge sites are retained beneath power lines.
- Power lines can be planned and constructed in such a way that they can avoid heritage sites. The narrow corridors which power lines follow give them maneuverability as these corridors can be navigated around or between concentrations of heritage sites without physically affecting heritage sites or cultural landscapes.
- Heritage sites can be conserved beneath power lines if pylons are spaced in such a way that they do not affect (remove, damage, alter) heritage sites which are left *in situ*, (unaffected) underneath power lines. Power lines are strung onto pylons which are erected considerable distances from each other and these distance vary according to the size of the power line structure and tha capacity of the electrical load its carries. Considerable distances occur between the pylons of 765kV power lines in which exceptionally large heritage sites such as single stone walled sites or small clusters of sites can be retained and conserved.
- Although mitigation measure do exist for all types and ranges of heritage resources they do not have to be applied when heritage sites can be left unaffected in power line corridors.

It is therefore possible to say that the development of power lines may have less an impact on heritage resources than more drastic developmental projects. Power lines therefore are more sensitive and conservation friendly towards heritage resources than other kinds of development projects. Mitigation measures further reduce the affect of power line development projects on heritage resources. The conservation of heritage resources in power lines corridors are further advanced by means of walk-through studies which are conducted before alignments for power lines are fixed and before the construction of power lines commence. The impact of power lines on heritage resources therefore can in many instances be categorised as low

4.7 Impacts of power lines on heritage resources

Two main types of impacts can be distinguished with regard to heritage resources and power lines, namely:

- Physical impacts which occur when pylons are constructed on top of heritage resources which occur on the surface of the earth..
- Visual impacts occur when power line infrastructure affect the aesthetic and visual appearance, sense of place, context, or other aspects relating to heritage resources in a negative way.

The accuracy with which impacts between heritage sites and power lines corridors is predicted is in some instances a matter of conjecture as the impacts between power lines and heritage resources are determined according to 'clashes' ('collisions') that appear to occur between the power line corridors and heritage sites on maps. This is not always a true reflection of the real situation. Heritage resources near the perimeters of power line corridors may actually be 'missed' by the power lines which are generally slimmer than power line corridors on maps. Power lines also do not represent solid structures (in contrast with power line corridors on maps) but are elevated infrastructure which hang above heritage sites which occur on the surface of the land.

The level of impact of power lines on heritage resources may vary if single power lines are kept in a corridor or when a varying number of power lines are grouped

together in a single corridor creating increasing wider corridors filled with more than one power line as well as many pylons that have to carry these power lines.

The higher the number of pylons in a power line corridor, the higher the physical impact of the footprints of the pylons on the earth will be. More than one power line grouped together are usually more visually discernable than a single power line and should cause a higher visual impact.

The following positive and negative impacts on heritage resources can be distinguished when the following power line corridors are considered, namely:

- A corridor comprising one (1) or two (2) power lines.
- A corridor comprising three (3) power lines.
- A corridor comprising of six (6) power lines.

Narrow corridors (1 or 2 power lines)	**Medium corridors (3 power lines)**	**Broad corridors (6 power lines)**
Positive impacts	**Positive impacts**	**Positive impacts**
Hang above heritage resources	Hang above heritage resources	Hang above heritage resources
Heritage resources can be preserved underneath power lines	Heritage resources can be preserved underneath power lines	Heritage resources can be preserved underneath power lines
High manoeuverability with regard to realignment		
Low physical impact least pylons		
Low visual impact		
Negative impacts	**Negative impacts**	**Negative impacts**
	Medium manoeuvrability with regard to realignment	Low manoeuvrability with regard to realignment
	Medium physical impact more pylons	High physical impact most pylons
	Medium visual impact	High visual impact
		Devastating to NO GO Areas and cultural and town landscapes when enforced
Preferred zone to construct	**Preferred zone to construct**	**Preferred zone to construct**
Central zone with high concentration of heritage resources	Northern and southern zone with low concentration of heritage resources	Northern zone with low concentration of heritage resources

Table 1- Positive and negative impacts of three types of power line corridors on on heritage resources (above).

4.8 The significance and mitigation of heritage resources

Various types and ranges of heritage resources are outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999). The significance of heritage resources is usually determined according to criteria such as the following: the scientific, research, esthetical, educational, ideological, tourism, etc value of heritage resources. Other criteria which may apply are the repeatability (scarceity); condition (dillapidated, restored, altered, disturbed) and inhirent cultural, historical, industrial, economic and contextual value that each and every heritage resource posesses.

The significance of heritage resources therfore must be determined before heritage resources may be affected by the Eskom Project. However, the significance of each heritage resource that may be affected by the Eskom Project can only be determined after the affected heritage resources has been positively identified after the walk-through study has been done and after the realignment of the power lines have occurred as some of these heriatge reources may be avoided by the power line corridors or heritage resources may be kept unaffected in power line corridors.

The proposed power line corridors hold a number of heritage resources. Undiscovered heritage resources may raise this number although it is generally accepted that this number will decrease after the walk-through study has been conducted and the power lines have been realigned in order to avoid some of these heritage resources. The exact number of heritage resources that may be affected by the proposed power lines and the significance of each of these heritage resources therefore are not yet known.

The level of significance of each heritage resource will determine what mitigation measures have to be followed before this heritage resource may be affected by the Eskom Project. The nature and extent of the mitigtaion measures will again determine the permitting process that has to be followed with the South African Heritage Resources Authority (SAHRA).

5 THE HERITAGE POTENTIAL OF THE ESKOM PROJECT AREA

5.1 Location

Eskom's proposed 6X765kV power lines will run between the Delta Substation near Lephalale in the north to the Epsilon Substation near Potchefstroom in the south crossing both the Limpopo and North-West Provinces of South Africa. The eliptical shaped Eskom Project Area roughly covers a surface area of approximately 80 000 square kilometers - in archaeological and heritage terms an enourmous region - while each of the preferred routes from north to south stretches across a distance of at least 360km.

The proposed power lines will stretch across three different ecozones, namely bushveld savannah in the north, a central undulating mountainous stretch of land which is part of the Bankeveld and the southern grass veldts of the Highveld. These three ecozones are characterised by different types and ranges of heritage resources which relates to the unique ecological features of each of these zones and the subsequent interventiorf of humans and human groups on these various geological and ecological resources from the earlies times (Lephalale 2528; Rustenburg 2527 & West Rand 2626 [1:250 000 maps]).

5.2 Ecozones and heritage resources

A few hundred heritage resources have been identified for the Eskom Project Area using the methodology as outlined in Part 3 of this report. The size and extent of this region as well as the time frames allowed for this project made it impossible to cover the region by means of a fully-flexed archeological reconnaissance. Many hundreds and perhaps thousands of sites therefore still lay undetected in this vast region and will only be found when they are searched for in planned, organised reasearch programmes or when they are accidentally discovered. Many of the identified sites were geo-referenced and mapped whilst others, although occuring in the Eskom Project Area, are merely referred to (and not mapped) as they fall outside the power line corridors.

The aim with this broad discussion of all the types and ranges of heritage resources in and near the Eskom Project Area is to outline and to describe the heritage character of the Eskom Project Area and, similtaneously, to illuminate the three ecozones and their different types and ranges of heritage resources. The characterisation of the pre-historical and historical identity of each of these regions enables a grasp of the pre-historical and historical unfolding of each of these zones and the meaning and significance of heritage resources that typifies each of these zones.

5.2.1 The northern savannah Bushveld

The northern part of the Eskom Project Area stretches from Lephalale in the north to the Pilanesberg which is located roughly in the middle of the project area. The eastern perimeter of this zone is demarcated by foothills of the Waterberg, the western escarpment of the Marakele Mountains (Nature Reserve) and the western end of the Vlieggepoortberge. In the south-west this zone ends near Dwaalboom and the Dwarsberge, Northam in the middle and in the south-east near Ramakoka with its extensive Swartwitpensbokfontein mountains. The Matlabas and Crocodile Rivers are the main drainage courses in this zone and run north-westwards in order to join the Limpopo River.

Major towns and villages in this area include Lephalale, Thabazimbi, Northam, Ramakoka and several younger settlements such as Rampampaspoort which arose directly to the south of the Dwarsberge.

Occupation of the northern zone started at an early period, probably from the Middle Stone Age (MSA) two hundred thousand years ago. MSA artefacts have been observed along the banks of the Mogol, Phalala and Limpopo Rivers, outside the Project Area, as well as at Nelsonskop where cupules and potsherds were noted. Most of the Stone Age sites in this zone can be classified as open (surface) sites which imply that most of the artefacts occur 'out of context'. Such assemblages have less significance than artefact types which occur in closed stratigraphic layers. Rock shelters and caves with paintings are common in the Waterberg to the east of the Project Area. Rock paintings sites occur on Rhebokshoek 638 and Bulsfontein 639 in

the Kurumakatiti Nature Reserve. The Olieboompoort rock shelter with MSA and LSA assemblages on Waterval 601, next to the Rietspruit in the Waterberg is currently being researched. This site also holds rock paintings.

Numbers of ephemeral Early and Late Iron Age settlements which date from the first millennium AD were recorded north of the Limpopo River in Botswana, outside the Project Area. Similar sites possibly occur in older floodplains of the Limpopo River on South Africa's side of the border. A number of Iron Age sites have been recorded along tributaries of the Matlabas River on(Rhebokshoek 638, Haarlem Oost 51, Springbokvlei 55, Turfpan 54, Leamington 20, Somerset Noord 21, Elysium 395).

A similar settlement of Iron Age communities at junctures between the Crocodile River and its tributaries can be expected. Rathateng, on the confluence of the Crocodile and Marico Rivers, an important origin centre in Sotho-Tswana oral history, is a typical excample in point. An extensive iron smelting site and other Iron Age settlements occur near the Mamba River on Diamand 228 and on farms near the Bulge River, east of the Eskom Project Area.

The Historical Period for this zone commenced with the arrival of the first colonial hunters, traders and farmers during the first half of the nineteenth century. The Lephalale region served as a nexus for hunting parties operating from Vaalwater and the Waterberg in the east, Thabazimbi in the south and Botswana in the north-east. Settlement in the north, however, was not on a permanet basis and Lephalale only rose to prominece after the discovery of its vast coal fields when exploration for water commenced in the 1920's.

Figure 1- The northern part of the Eskom Project Area seen from the air. Outstretched open savannah veldt with little surface water is a dominant feature of the landscape. The Eskom Project Area borders on the western foothills of the Waterberg Mountain mass (background). This inhospitable environment was not conducive for human settlement in the past (above).

A few historical houses with graveyards, including informal graveyards, occur but are widely scattered across the Project Area. Most of these houses date from the 1930/40's and are of a similar architectural style. Many of these farmsteads and associated infrastructure have been altered and/or renovated. Cultural landscapes, such as those in the older Waterberg region to the east, therfore do not exist in this part of the Eskom Project Area.

Similarly, Thabazimbi further to the south only became important after the discovery and exploitation of enormous iron deposists in the Vlieggepoort Mountains from the

1930's onwards. Evidence for pre-historic iron smelting and habitation was recorded in the Ben Alberts Nature Reserve. It seems as if the area stretching north and north-westwards from Thabazimbi towards Sentrum may have been scarecely occupied during the Late Iron Age and Historical Period, and possibility at times during the pre-historical period as well. The 'Vlieggepoort' mountain range's name, which is located to the west of Thabazimbi, refers to the presence of tstese fly in this area. Tsetse was only eradicated after the runderpest of 1894. The tsetse fly prevented pre-historical and historical communities to breed with stock and therefore to establish permanent settlements and subsistence patterns based on farming.

People occypying this area during the late pre-historical and historical period was the Vaalpense, a mixture of Negroied and San people. These communities were nomadic hunters and herders and roamed the norther part of the Eskom Project Area before they became employed by the first colonial farmers. They did not occupy large permanent settlements that have left traces on the landscape.

The utilization of minerals such as iron and copper occurred at an early time in this zone. Shafts that were used for copper mining were recoded along the western end of the Dwarsberg. Exploration and mining for minerals not yet identified (as the site has not been strudied) also occrred near the southern banks of the Crocodile River on the farm Sweet Home 233. Magnetite ores were also smelted at sites around Thabazimbi while some unknown mineral was mined on Zandfontein 394 near the Matlabas River.

Humans groups therefore were present in the northern part of the Eskom Project Area over a long time span, but on a limited and widely scattered scale. EIA as well as LIA communities did not prefer the northern fat outstretched sand veldt for habitation and for farming. The scarcity of drinkable surface water; low annual summer rainfalls, high temperatures with accompanying high evaporation rates and soils which lacked nutrients, were not conducive to crop planting. The absence of all year round grazing also did not encourage mixed farming which may have been restricted to alluvial soils near major river courses and their tributaries.

The mountainous Swartwitpensbokfontein area around Ramakoka in the south-east is an exception. This area is more fully discussed as part of the central zone of the Eskom Project Area (below).

5.2.2 The Bankeveld in the middle

The central part of the Eskom Project Area stretches from the Swartwitpensfontein mountains and the Pilanesberg in the east to Zeerust and Marico in the west. The northern stretch of the Magaliesberg running from Rex (Olifantsnek) to Boshoek also falls into this part of the Eskom Project Area which is considered to be part of the central and western Bankeveld. Rivers that traverse this area are the Hex River which runs northwards through the Magaliesberg in order to join the Elands River which runs from east to west along the northern border of this region. The Toelani and Groot Marico Rivers further to the west meanders northwards and eventually join the Crocodile River in the far north-west. Settlement of historical communities such as the Sotho-Tswana and Voortrekkers also occurred along smaller rivers and streams such as the Ngwaritsi and Roosspruit.

The Bankeveld is characterised by physiographic and ecological different zones and niches harbouring different types of heritage resources. The most outstanding feature of this part of the Eskom Project Area is it mountainous character caused by the Swartwitpensfontein mountains in the far east; the chain of nortite hills known as the Thaba- ea-Nape mountain range that runs northwards towards the Pilianesberg; the Pilanesberg, Magaliesberg and Matlapynsberg and the Swartruggens mountains running from Swartruggens to Zeerust in the west. This undulating piece of land is interspersed with level stretches of land.

Most remarkable of all these mountains is the circular Pilanesberg mountain complex which served as an enclave for human occupation and utilisation from the earliest times. During the Late Iron Age access to the Pilanesberg was controlled by well-positioned and extensive settlements near the periphery of its circular footprint and close to some of the entrances leading to the pathway-like valleys which criss-cross

the central part of the Pilanesberg. Most of the heritage sites in the Pilanesberg have been recorded by means of archaeological surveys.

This part of the Eskom Project Area incorporates the towns and villages of Mogwase, Rustenburg, Ga Luka and Phokeng in the east, Swartruggens, Tlokweng and Silwerkrans in the middle and Groot Marico and Zeerust, to name but a few, in the west.

Hundreds of thousands of people are concentrated in this part of the Eskom Project Area which also represents the economic hub of the North-West as most of the country's platinum and chrome mines are concentrated in this part of the country. This ecozone's high population, expanding mining industry and general dynamics are currently putting an enormous pressure on its existing heritage resources.

This part of the project area has the highest number of heritage resources; the densest concentrations of heritage sites in particular areas in this zone and the highest number of all types and ranges of heritage resources when compared to the other two zones in the Eskom Project Area. It holds at least eight No Go Areas. Occupation of this part of the Eskom Project Area occurred throughout the different periods for the Stone Age, the Iron Age and the Historical Period. Human occupation was intensfied when Late Iron Age communities proliferated and expanded during the last three to four hundred years. The numerous ancestral Tswana and Nguni clans who occupied this region left the remnants of thousands of stone walled settlements scattered from Ramakokoka in the east to Zeerust in the far west.

Although Stone Age people must have been well represented during the different periods for the Stone Age in this part of the Eskom Project Area, their presence have not yet been recorded in high numbers, primarily as a result of the absence of dedicated heritage surveys for Stone Age sites. An extensive Early Stone Age site with Acheulian tools have been recorded on Rhenosterfontein 390, west of the Selons (Ngwaritsi) River. Several well known rock shelters with extensive Middle and Later

Stone Age deposists were investigated by archaeologists in the Magaliesberg, outside the Eskom Project Area.

The Kruger Cave in Olifantsnek in the Magaliesberg is the only cave site whose extensive MSA and LSA collections was investigated in this part of the Eskom Project Area.

A rock engraving site asociated with the LSA occurs on Avondale 315 near the western foot of the Magaliesberg. Rock engravings depicting Late Iron Age settlement patterns on the surfaces of dolerite boulders on Olifantspoort 328 are linked with herder boys who lived in some of these Late Iron Age settlements on this farm.

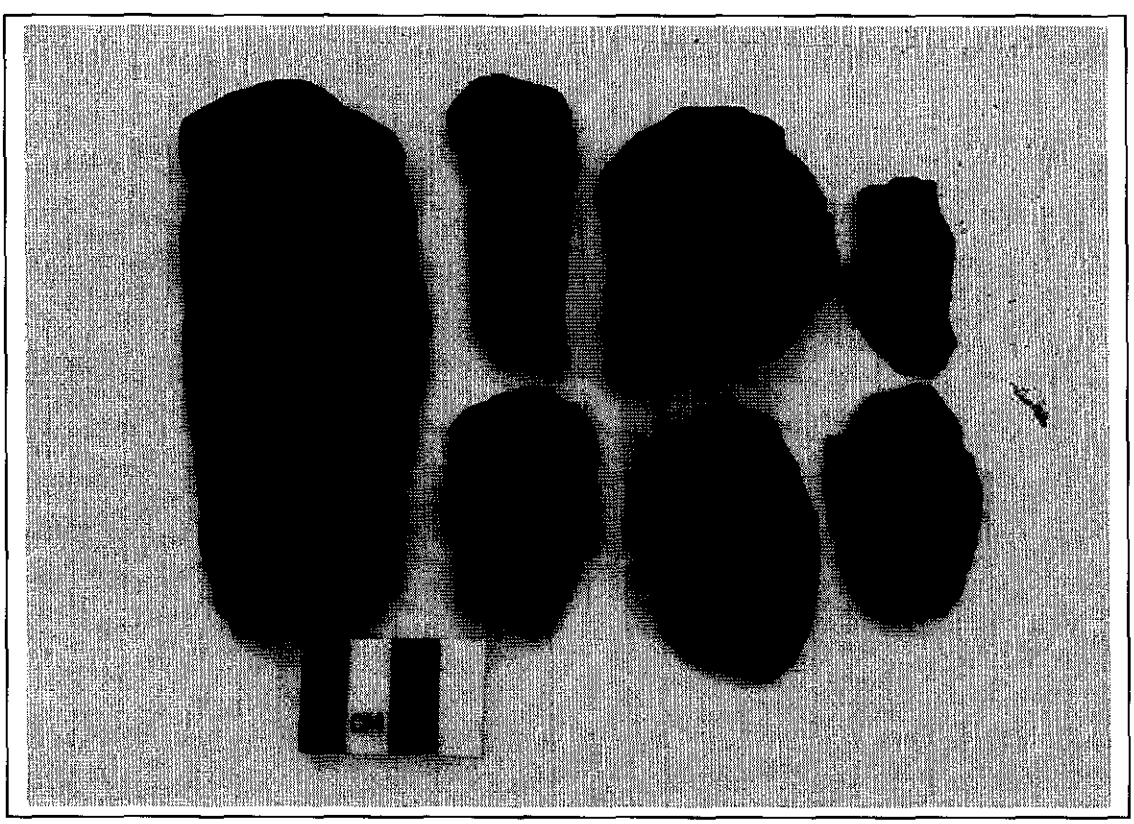

Figure 2- Middle Stone Age artefacts manufactured from hornfels from Rhenosterfontein 390, west of the Selons (Ngwaritsi) River (above).

Ephemeral Early Iron Age sites with Eiland type potsherds were recorded in the far western parts of the Eskom Project Area near Zeerust, but on a limited scale. However,

the Bankeveld was primarily favoured by Late Iron Age (LIA) communities who established large village complexes which were constructed with stone walls near and on the slopes and spurs of mountains and hills in this region.

Late Iron Age stone walled sites occur from Ramakoka in the east to Zeerust in the west and are associated with the ancestors of the Tswana and Nguni. Ancestral Tswana clans who occupied some of the thousands of stone walled sites in the central and western parts of the Bankeveld were the following:

- The Kwena Phalane who occupied the mountaineous Swartwitpensfontein mountains around Ramakoka. This area is an unknown entity with regard to its heritage content as no surveys have been conducted here as yet. It is possible that pristine stone walled complexes may occur in this area.
- The Kgatla Kgafela lived at settelements such as Mabele-podi, Saulspoort and Ga Ramoga along the northern and eastern perimeter and inside the Pilanesberg. A graveyard which is used by the royal family is located on Modderkuil 397, north of the Pilanesberg.
- An extensive Late Iron Age population with settlements which resemble Tswana and Nguni villages (a Ndebele population?) lived to the north of the Pilanesberg in a triangular area between the mountains of Mmatone, Mogare and Phatswane on the farms Witkeifontein 136 and Tuschenkomst 135. This Late Iron Age cultural landscape has been earmarked as a No Go Area (NGA01). Outlier settlements near this complex incude Mabjaneng, Mukukunupi, Motsotsodi and Matlagabe on Zandspruit 168.
- Pilwe Hill to the south-west of the Pilanesberg on Swartkoppies 212 was home to the Tlokwa who also occupied the mega stone walled site Marathodi on Vlakfontein 207, in close proximity of Pilwe. Marathodi has been earmarked as a No Go Area (NGA02).
- Smaller and less conspicuous stone walled sites occur along the Tlhatlayagana mountain range (Ruighoek) to the west of the Pilanesberg where the Tlhako lived during the Late Iron Age and Historical Period.

- The Fokeng occupied the area between the Magaliesberg in the west and the Thaba ea Nape range of hills in the east. Here, ancestral groups established hundreds of stone walled sites along the norite hills. At least two dense concentrations of stone walled sites occur at Ga Nape (NGA03) in the north and and near Elandsheuwel (NG04) further to the south. These two areas are historically associated with Fokeng rulers such as Diale and Nape and have been demarcated as No Go Areas.
- The Kwena Modimosana chiefdoms of Ramanamela and Maaka, two of the biggest Late Iron Age populations in Southern Africa during the last three hundred years, established the mega stone walled complexes Molokwane (Selonskraal 317) and Boitsemagano to the west of the Magaliesberg on Shylock 256. Both these village complexes cover several square kilometers and housed teeming populations numbering thousands of individuals from AD1700 onwards. Both Molokwane and Boitsemagano were demarcated as No Go Areas (NGA05, NG06).
- Mzilikazi of the Ndebele established several settlement complexes in the central and western Bankeveld (1828-1837) when moving through this region. At least two occur in the Project Area, namely along foothills of the Magaliesberg directly north of Rustenburg, and possibly at Silkaatskop on the farm with the same name (Zilkaatskop 16), north of Zeerust. A monument was erected at this site.
- Stone walled sites also occur along the Toelani River in the triangular area between Swartruggens in the east, Groot Marico in the west and Silwerkrans in the north. These sites may be associated with the Hurutshe and Tlokwa. This area has not been surveyed as yet. Sites know in this area are those on Modderfontein 256 and on Slypsteenkop 379.

- A number of stone walled sites associated with the Hurutshe occur in the Groot Marico and Zeerust area in the far western side of the Project Area. The capital of this chiefdom was Kaditshwene, a massive stone walled site which was demarcated as NGA07 on the farms Kleinfontein 62 and Bloemfontein 63.
- A cluster of kopjes on the farms Moddergat 416, Koppie Alleen 422 and Amandelbult 417, on both sides of the road running from Northam to Thabazimbi further north, hold many stone walled sites. The identity of these Late Iron Age

communities, together with those who lived along the base of Spitskop 410, further to the south-west, may be found amongst the Kwena Mogopa and/or Kwena Phalane.

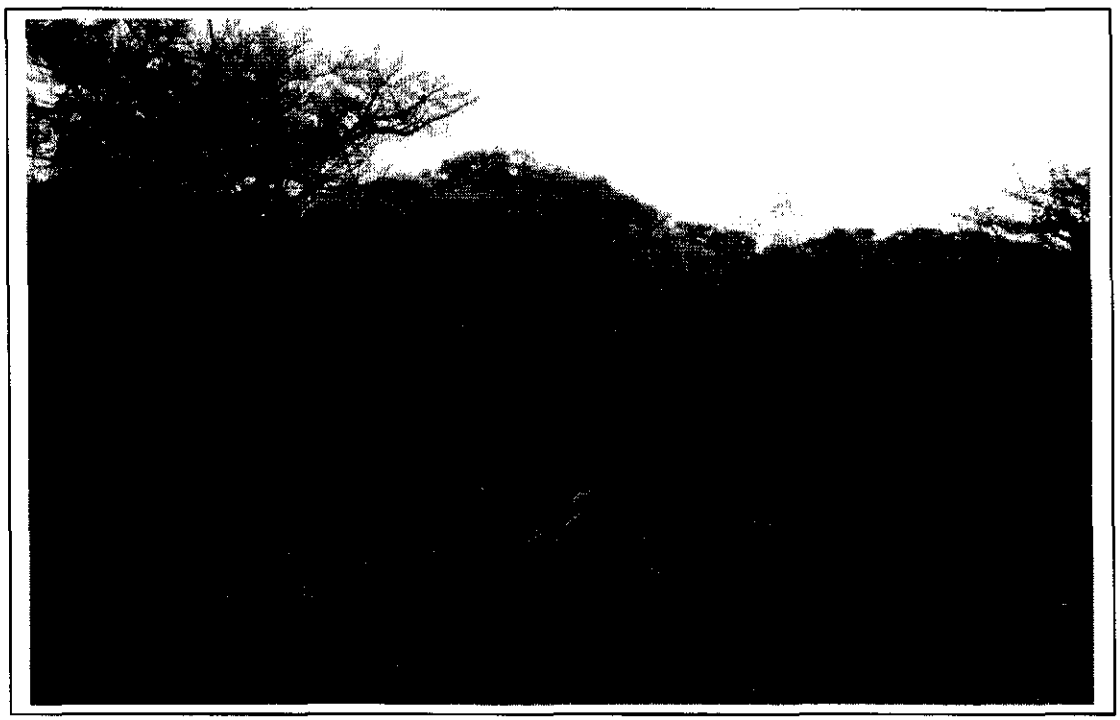

Figure 3- Clusters of stone walled settlements on Mmatone, Mogare and Phatswane were occupied by Tswana, Zulu (Ndebele) and mixed populations of Tswana and Zulu (Ndebele) populations from the 17th century onwards. This site in the central part of the Eskom Project Area has been indicated as a No Go Area (above and below).

The colonial history of the central part of the Projerct Area commences with the establishment of Rustenburg during the late 1830's, one of the olderst Voortrekker towns in the North-West. The Voortrekkers also settled in Groot Marico from 1845 onwards and the ZAR proclaimed a new district in 1871 with the name Zeerust as the main centre. Swartruggens was founded on the Elands River in 1875 and its first store opened in 1895. Small scale diamond mining started in 1932 north of the town while slate quarrying occurs further to the south of the Swartruggens mountains. The early development of these Voortrekker towns was linked to hunting, cattle farming and

the cultivating of tobacco and citrus. Crops such as wheat, maize and lucern are planted under irrigation these days.

Heritage sites associated with Voortrekker towns in the central zone are mostly confined to houses, churches, forts, cemetaries and commemorative beacons which all occur within the boundaries of the towns where they will not be affected by the Eskom Project.

Few historical houses occur towards the east in this part of the Eskom Project Area as most of these have been obliterated by development. Historical houses, some with outbuildings and graveyards, are more common towards Swartruggens, Groot Marico and Zeerust in the west where farming practises persist. A reconstructed cast iron wheel and mill on Naauwpoort is merely but one historical structure which has been preserved in Groot Marico. It was probably build between 1900 and 1910.

An important historical beacon north of Rustenburg is Paul Kruger's Boekenhoutfontein farmstead on the farm with a similar name. This historical farmstead served as home for Paul Kruger, president of the Zuid Afrikaansche Republiek (ZAR) (1862-1903). This historical farmstead was demarcated as NGA08. The oldest existing dwelling near Rustenburg is the Schoch House on Boschendal 309 which was build in 1874.

During the Anglo Transvaal War (1899-1902) several battles between the Boers and the British were fought in this part of the Eskom Project Area. The location of at least two British block houses on the Magaliesberg are known, namely one on top of the mountain near the Olifantsnekdam and near Magatasnek. More of these structures may occur as the line of blockhouses which was established by the British between Rustenburg and Krugersdorp served an important defensive role for Rustenburg during this war. However, many of these structures are in severly dilapidated condition and barely recognisable any longer.

At least four battlefields were documented in this part of the Project Area, namely:

- The battle of Mosega (July 1836) between the Voortrekkers and Mzilikazi's Ndebele took place at Zendelinspost 300, south of Zeerust, outside the Eskom Project Area.
- The Battle of Elands River (Brakfontein) (3-16 August 1900) occurred directly on the eastern border of the town of Swartruggens. Here, is also a graveyard which holds the remains of some of the combatants.
- The Battle of Kleinfontein (24 October 1902) occurred on the farm Kleinfontein 260, directly south of the N4. A commemorative beacon has also been erected at this place.
- The Battle of Moedwil (19 September 1901) took place at Moedwil, halfway between Rustenburg and Swartruggens.

Figure 4- The dilapidated entrance to an incline shaft of a historical chrome mine on the border of Witkeifontein 136 and Rooderand 46 in the central part of the Project Area (above).

A dominant geological feature in the Eskom Project Area is the presence of the western limb of the Merensky Reef which runs northwards from Rustenburg towards

Northam. Platinum and chrome mining commenced at an early period along this reef and mining heritage remains, although limited, do occur north and north-west of the Pilanesberg where chrome was mined on Groenfontein 138, Wilgespruit 2 and other farms from the 1940's onwards. Platinum mining followed during the 1960's but the rapid development of this mining industry left few traces of earlier attempts to explore, mine and process platinum along the Merensky Reef, from Rustenburg in the south to Northam in the north.

The occupation of this part of the Eskom Project Area by a large population over a long period of time has ensured that large numbers of formal and informal cemeteries are scattered across this vast area.

Figure 5- One of numerous informal graveyards which are scattered throughout the Eskom Project Area (above).

5.2.3 The Highveld in the south

The southern part of the Eskom Project Area runs from Koster and Derby in the north to Stilfontein, Klerksdorp and Potchefstroom in the south. This part of the Eskom Project Area incorporates the northern tip of the Highveld which is marked by outstretched grass veldt with few indigenous trees. Although largely flat and outstretched this piece of land becomes more undulating towards the south where mountains, some with flat tops, occur closer to Potchestroom and Klerkdorp. One of these mountains, called Platberg (Thabeng), holds a concentration of Late Iron Age stone walled sites on its summit.

Rivers in this part of the project area is the Vaal River which is situated to the south of the Eskom Project Area. The Mooi River runs from the north-east to Potchestroom, the Taaiboschspruit and the Schoonspruit runs from Ventersdorp in the north towards Klerksdorp further to the south. First the Tlokwa and then the Voortrekkers (Oudedorp) occupied the banks of the Mooi River at an early period whilst early Sotho-Tswana communities build stone walled settlements on and near flat topped hills along the Schoonspruit in the vicinity of Klersdorp.

Large tracks of land are currently under cultivation in the Eskom Project Area rendering these portions of land devoid of any significant types and ranges of heritage resources. Two No Go Areas occur in the south but they fall outside the Eskom Project Area.

Many Stone Age sites have probably been ploughed under in this part of the Eskom Project Area as a result of cultivation. However, it can be expected that stone tools will be found where dolerite and other suitable rock appear as ourtcrops.

Evidence for Stone Age occupation of this part of the Highveld dates back to an early period. Early Stone Age (ESA) people lived near the banks of the Vaal River, perhaps as long as 500 000 years ago. Stone tools manufactured from dolerite and with Sangoan features occur on the farm Byl 421, near Stilfontein. These stone tools are probably older than 250 000 years. A unique concentration of at least six hunderd

engravings occur on a concentration of dolerite boulders on Bosworth (previously Doornhoek 24/327), north of Klerksdorp. The engravings depict a wide variety of the erstwhile fauna of the Transvaal, human figures and artistic renderings of animals such as the rhinoceres.This area has been demarcated as a No Go Area (NGA09).

Iron Age occupation of this part of the Eskom Project Area is limited. The exception being concentrations of stone walled sites on both sides of the Schoonspruit running north and westwards away from Klersdorp. One of these concentrations (possibly on Buisfontein 367) occur on the flat summit of Platberg (Thabeng). This settlement complex was probably occupied by a prominent Rolong community during the Late Iron Age and was demarcated as a No Go Area (NGA10).

Potchefstroom and Klerksdorp are the two oldest Voortrekker towns in the North West and were established on the Mooi River and Schoonspruit,respectively, from the 1830's onwards. Potchefstrroom as the oldest town in the former Transvaal Province holds many heritage sites in the town itself, e.g. historical houses and churces, a powder magazine, a concentration camp cemetery, etc.. The discovery of gold near Klerksdorp in 1886 initially boosted this small village when thousands of diggers descended on the town. Although most of the initial mining companies gradually folded Klerksdorp eventually became the hub of the gold and uranium industry of the North-West. Heritage resources in town include a sandstone building erected in 1891, the first stock exchange building which was established 1888, a railway station, an Anglo Boer War cemetery, etc.

Stilfontein is situated between Potchefstroom and Klerksdorp, which like Orkney further south in the Orange Free State, has Scottish connections. The discovery of gold on Stilfontein in the 1880's lead to the establishment of the Stilfontein Gold Mining Company and the town was laid out in 1952. Today the town accommodates the work force of four large gold mines.

Figure 6- A historical farmstead on the southern highveld in the southern part of the Eskom Project Area (above).

Other smaller towns in this part of the Eskom Project Area are Ventersdorp, Koster and Derby. Ventersdorp was established as a Dutch Reformed parish in 1866 which gradually developed into a village named for the original owner of the farm, Johan Venter. Koster came into being in 1913, soon after the railway line between Johannesburg and Mafekeng was estblished. The last diamond rush in South Africa occurred here in 1970.

Although early diamond mining sites occur in this part of the Eskom Project Area these remains are ephemeral when compared to Lichtenburg's Bakerville diamond fields, outside the Project Area. Derby began as settlement for destituted people. During the Anglo Boer War it was the scene of a battle between the Boers and a Scottish horse regiments. The British who fell in the engagement were buried in the local cemetery.

Historical farm homesteads with dwellings, outbuildings and family graveyards occur near most of these towns. Some of the farmsteads are associated with outbuildings and in some instances with graves. One can therefore expect that some of these farmsteads and associated infrastructure may constitute cultural landscapes of smaller proportions.

Only two battlefields can be distinguished where the British and the Boers fought in the past, namely:

- The Battle of Ysterspruit (25 February 1902) occurred near Orkney, outside the Project Area.
- The Battle of Frederikstad (20-25 October 1900) occurred 20km north of Potchefstroom near the northern edge of the Boskop Dam. A monument in honour of the fallen burghers was erected here.
- The Battle of Vlakfontein (29 May 1901) ocurred on the farm with the same name, namely Vlakfontein 373, near the town of Derby.

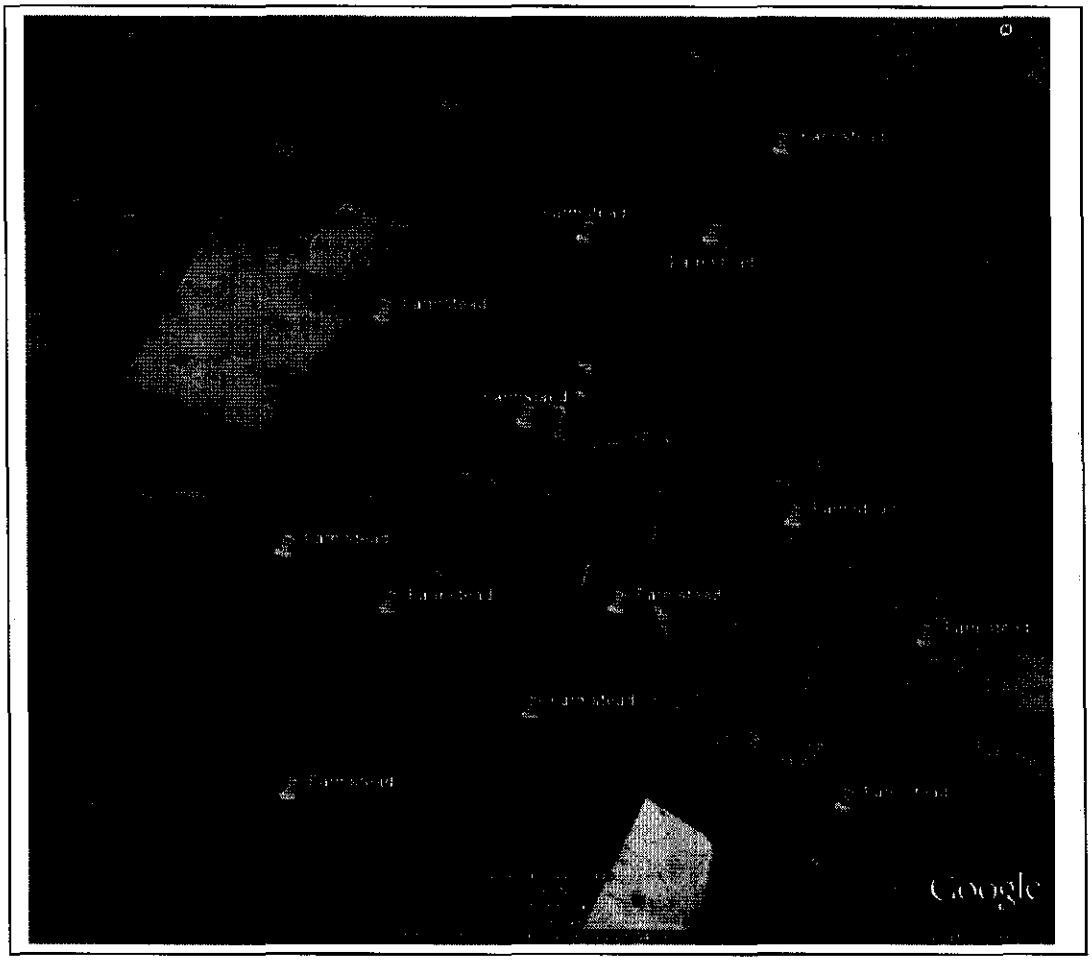

Figure 7- Google image showing high number of farmsteads near Koster and Derby in the southern part of the Project Area. It is not clear from Google imagery whether these farmsteads and associated infrastructure may have historical significance (above).

HERITAGE RESOURCES	North Zone	Comments	Central Zone	Comments	South Zone	Comments
STONE AGE						
Early Stone Age	0		1		1	
Middle Stone Age	1		2		1	
Later Stone Age	1		2		1	
Engravings/paintings	1	Nelsonskop Rhebokhoek Bulsfontein	1	Olifantspoort Avondale	1	Bosworth (Doornhoek)
IRON AGE						
Early Iron Age	1	Ephemeral north of PA	1	Ephemeral in the west	0	
Later Iron Age	1	North/south of Matlabas	3	Eight No Go Areas	1	Platberg
Pre-historic mining	1	Sweet Home Zandfontein (Matlabas)	1	Dwarsberg	0	
HISTORICAL PERIOD						
Cultural landscapes	0		1	Swartrugens Groot Marico Zeerust	1	Ventersdorp Koster Derby
Historical houses	0	Uniform 1930/40's	2	Ditto	2	Ditto
Graveyards	1		2		2	
Battlefields/monument	0		1	Kleinfontein Moedwil	1	Vlakfontein (Deby)
Historic mining	1	Sweet Home? Zandfontein?	1		1	Gold Diamonds
NO GO AREAS	**0**		**8**		**2**	**Outside Project Area**

Table 1- Known types and ranges of heritage resources in the three zones of the Eskom Project Area (above).

0 Probably non existent
1 Low in numbers
2 Medium in numbers
3 High in numbers

6 THE PHASE I HERITAGE IMPACT ASSESSMENT FOR THE PREFERRED ROUTES FOR THE DELTA EPSILON POWER LINES

The following corridors for the Eskom Project were assessed in terms of the presence of various types and ranges of heritage resources in/near these power line corridors. Deviations occur along these power line corridors which are the following, namely:

- Western corridor and deviations (Corridor Ba, Marico Bushveld FU Deviation and Bushveld Deviation)
- Central corridors (Corridors C B2 and C B3)
- Eastern corridors and deviations (Corridor D, Deviation D1 and Deviation D2 and Corridor F)

6.1 The western corridor and deviations

The western preferred corridor for the Eskom Project is Corridor Ba and two deviations, namely the Marico Bushveld FU Deviation and the Bushveld Deviation.

6.1.1 Corridor Ba

Corridor Ba runs along the following two stretches in the north, namely:

- From the Masa (Delta) Substation to the Matlabas River: This stretch extends from the Masa (Delta) Substation running westwards across farms such as Rooipan 357, Wildebeestfontein 381 and Jakkalsfontein 393 (on the Matlabas River).
- From the Matlabas River to the Crocodile River: South of the Matlabas River the power line corridor bends further to the south crossing farms such as Somerset Noord 21, Uitvlucht 25, Modderpan 42, Wildebeestpan 35 and Carolina 76 before reaching Faure 72 (on the Crocodile River).

After crossing the farm Faure 72, Corridor Ba turns to west in order to join Corridor A after crossing the farn Noord Brabant 114. It then runs southwards crossing farms such as Westindia 75, Hoylesdale 163, Keerom 164, Queenstown 191, Bethanie 218,

Amsterdam 227 and Kameelnek 278. Here, the power line corridor bends further to the west. On the border of Vogelstruisdraai 268 and Kameelnek 278 it crosses the Dwarsberg and a stream running to the north of Rampampaspoort village. Roughly at Brakspruit 114/Vaalboschlaagte 117 the Bushveld Marico FU Deviation turns southwards while Corridor Ba runs further south-westwards along the following stretches, namely:

- From the Dwarsberg to a sharp bend: From the Dwarsberg the power line corridor runs south-westwards across Mooiplaats 115, Goedgevonden 149 and Veeplaats 82 where the power line bends further towards the south.
- From a sharp bend on Veeplaats 82 to a second sharp bend on Zyferfontein 243: This stretch of the power line corridor runs southwards and farms such as Kromellenboog 104, Kleinfontein 260 and Rietvallei 288. It also crosses the N4 between Zeerust and Groot Marico.
- From the sharp bend on Zyferfontein 249 to the R52: This stretch of the power line corridor runs in a south-eastern direction across Rhenosterfontein 313, Rhenosterhoek 343 and Doornkop 372 on the northern shoulder of the R52.
- From the N14 to the Epsilon (Selomo) Substation: The last stretch of the power line corridor continues in a south-eastern direction and crosses Grootpan 117, Roodepoort 154, Grootvlei 161, Beta 159, Makokskraal 20, Klipfontein 344, Cut Out 387 and Eleazar 277 before ending at the Epsilon (Selomo) Substation.

6.1.2 The Marico Bushveld FU Deviation

The Marico Bushveld FU Deviation runs across the following farms in a southern direction, more or less following the Toelani River: Haakdoringlaagte 46, Taaiboschkuil 152, Optel 153, Diamandlaagte 183, Toelani 185, over Madikwe village, Turflaagte 188, Zandfontein 112m, along the eastern perimeter of Pella, Olivienkloof 373, Doornfontein 375, Sterkstroom 411, Uitvlucht 413, Rietfontein 316, Syferfontein 451, Brakkuil 449, Lonehill 452, Klipdal 474 and Corsindae 118 where this deviation joins Corridor Ba..

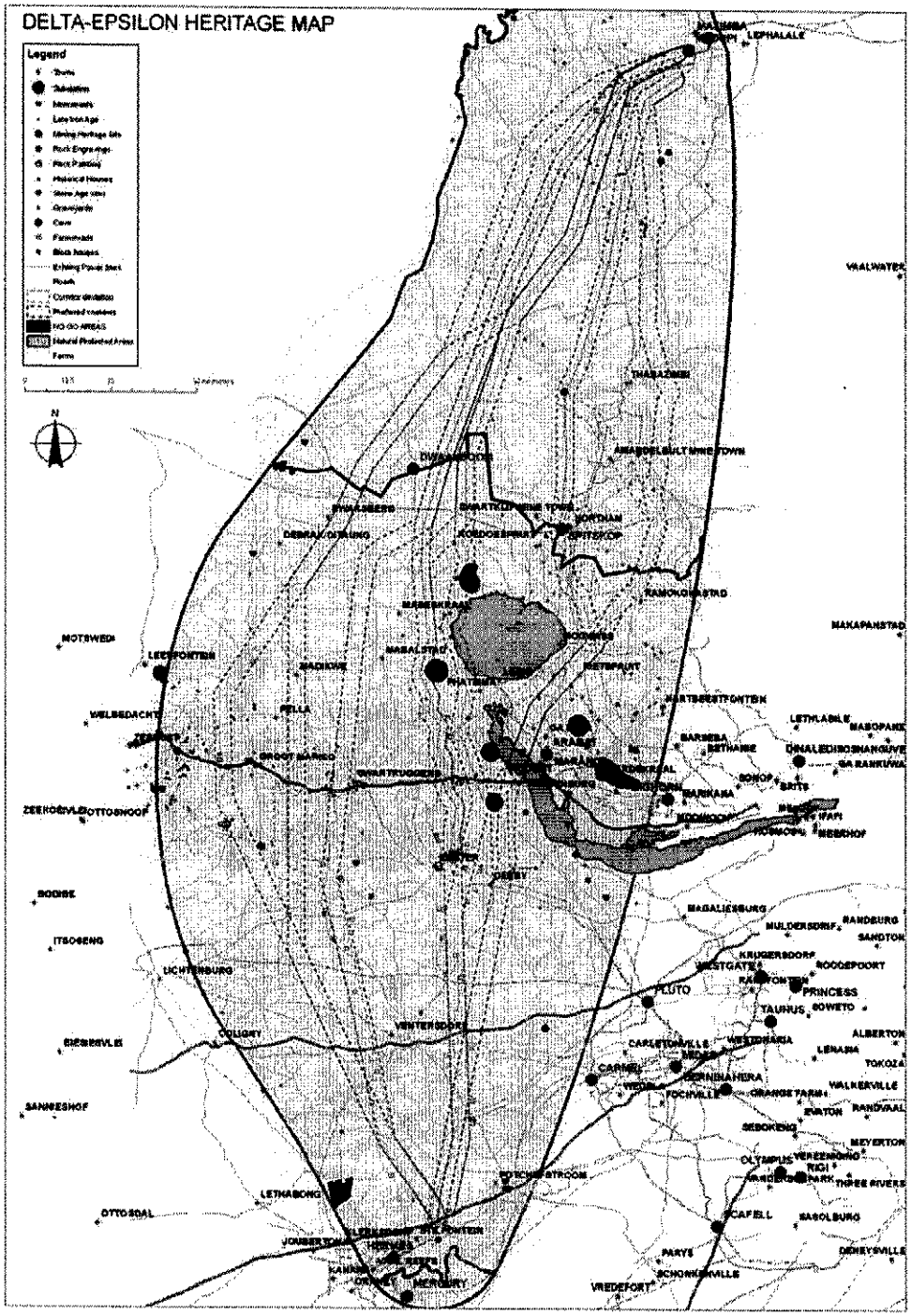

Figure 8- The Eskom Project Area with some of the preferred transmission power line corridors. Note heritage resources which are known and which have been mapped in the project area. No Go Areas are indicated (above).

6.1.3 The Bushveld Deviation

The Bushveld Deviation runs parallel with the Marico Bushveld Deviation southwards across the following farms: Koedoesfontein 291, Bronkhorstfontein 292, Rietfontein 316, Rhebokfontein 317, Bokkraal 344 and Droomland 345 where it turns eastwards in order to cross the Marico Bushveld FU Deviation. It now crosses Du Toitspan 473 where it turns to the south in order to run across Kruidfontein 470, Veld 480, Zwartrand 123, Boschhoek 129, Speculatie 150, Doornpan 193, Elandskuil 509 and Klipplatdrift 224 where this deviation joins Corridor Ba

6.1.4 Known heritage resources

The following known types and ranges of heritage resources occur in/near the corridor and deviations, namely:

- As many as six Late Iron Age stone walled sites are located in Corridor Ab along the stretch crossing the N4, between Zeerust (west) and Groot Marico (east). This stretch crosses the farms: Veeplaats 82 (108); Kromellenbogen 104, Welverdiend 105, Groot Kop 105, Kleinfontein 260, Rietvallei 288, Zyferfontein 293 and Rhenosterfontein 313. [The sites occur on Veeplaats 82 (1), Kromellenbogen 104 (2), Kleinfontein 260 (2), and Rhenosterfontein (1)].
- A monument commemorating the Battle of Kleinfontein (24 October 1902) is located on Kleinfontein 260 on the southern shoulder of the N4.
- An unknown number of farmsteads occur along Corridor Ab and the Marico Bushveld FU Deviation as well as along the Bushveld Deviation.

HERITAGE TYPES	Identified (Y/N)	Spatial presentation
Late Iron Age/historical sites	**Yes**	At least six stone walled sites in Corridor Ab between Veeplaats 82 and Zyferfontein 293 near Groot Marico. Part of the Late Iron Age/historical Hurutshe sphere of influence
Farmsteads (historical)		Unknown number of farmsteads in Option Ab and the two deviations. Some may hold historical significance (and cultural landscapes of small proportions).
Monument and battlefield	**Yes**	Battlefield of Kleinfontein and monument in Corridor Ab near N4 between Zeerust and Groot Marico

Table 2- Heritage resources positively identified in the western preferred corridor and deviations for the Delta (Masa) Epsilon (Selomo) 765kv transmission lines (above).

HERITAGE TYPES	Identified (y/n)	Spatial presentation
Stone Age sites	**No**	May occur in Corridor Ab and the two deviations, along banks of the Matlabas, Toelani and Crocodile rivers and streams; eroded areas and dongas; near outcrops such as shale, hornfels and dolerites
Farmsteads	**No**	Unknown number of farmsteads in Corridor Ab and two deviations may hold historical significance (and cultural landscapes of small proportions).
Late Iron Age/historical sites	**No**	Possible sites along the Toelani River in Bushveld Marico FU Deviation may be associated with the historical unfolding of Late Iron Age/historical Tlokwa.
Graveyards	**No**	Graveyards may occur in the central and southern parts of Corridor Ab and the two deviations

Table 3- Heritage resources which possibly may exist in the western preferred corridor and deviations for the Delta (Masa) Epsilon (Selomo) 765kv transmission lines (above).

6.1.4 Possible heritage resources

The following types and ranges of heritage resources may occur in/near the corridor and deviations, namely:

- Stone Age sites with scatters of stone tools may occur along the Crocodile, Marico and Toelani Rivers, near confluences of rivers and streams, erodod areas, dongas and outcrops suitable for tool manufacturing.
- Prehistoric copper mines occur in the Dwarsberg, but possibly further to the west of Corridor Ab.
- Some of the unknown number of farmsteads in Corridor Ab and in the Marico Bushveld FU Deviation as well as along the Bushveld Deviation may hold historical significance.
- The Marico Bushveld FU Deviation runs along and near the Toelani River and crosses farms which may hold important evidence for the historical unfolding of Late Iron Age/historical clans such as the Tlokwa.
- Undetected graveyards may occur in the central and southern parts of the Corridor Ba as well as in both the deviations.

6.2 The central corridor

The central preferred corridor for the Eskom Project Area has two options, namely Corridor C B2 (west) and Corridor C B3 (east). The difference between the two corridors is confined to a small stretch of power line that runs between the Crocodile River and the north-western perimeter of the Pilanesberg.

Following the same alignment both Corridors C B2 and C B3 run from the Masa (Delta) Substation westwards before bending south-eastwards running across the following main stretches of land, namely:

- From Masa (Delta) Substation to the Matalabas River: This stretch runs from farms such as Zandnek 358 before bending south-eastwards in order to run across farms such as Rooipan 357, Palmietvlei 396, Ellysium 395 and Leamington 20LQ (situated on the Matlabas River).

- From the Matlabas River to the Crocodile River: From Leamington 20 on the Matlabas River the power line runs southwards across amongst others the following farms: Liverpool 44, Partysvley 58, Klippan 82, Honeymoon 80 and Leeuwdrift 78 (on the Crocodile River).

After crossing the Crocodile River, Corridor C B2 turns to the west. The two corridors now cross the following farms between the Crocodile River and a point near the north-western perimeter of the Pilanesberg, namely:

- Corridor C B2 (west): This stretch runs southwards across Vlakplaats 113, Zuid Braband 610, Schotskar 187, Graaff Reinet 213, Groeneboom 236, Bedford 254 and De Kameelkuil 130.
- Corridor C B3 (east): This stretch runs southwards across Bethanie 112, Vlakplaas 293, Kleinbegin 327, Cyferkuil 330 and Zoetdoorns 259.

From the north-western perimeter of the Pilanesberg both Corridors C B2 and C B3 follow a corridor running southwards to the N4: This stretch crosses Gelyk 139, Vlakfontein 164, Tweelaagte 175, Kleingenoeg 174, Diamand 206JP, Vlaklaagte 215, Kromdraai 229, Hoogbomen 323 and Amorville 399 at the N4.

From the N4 to Koster: This short stretches crosses amongst others, Steenbokfontein 428, Kosterfontein 460 and Kortfontein 461.

From Koster to the Masa (Epsilon) Substation: The least stretch of the power line runs across Wendover 459, Flakfarkpan 497, Zwartplaat 170, Modderfontein 187 and Etta 382 to the Masa (Epsilon) Substation.

6.2.1 Known heritage resources

The following known types and ranges of heritage resources occur in/near these two corridors for the power lines, namely:

- As many as five small Late Iron Age occurrences on farms such as Leamington 10 (2), Wegdraai 18 (1) and Elysium 395 (2) on both sides of the Matlabas River in the northern stretch of both Corridors C B2 and C B3.
- The Battle of Moedwil (19 September 1901) occurred in a wide area to the north of Moedwil (N4), between Swartruggens (west) and Moedwil (east).
- A concentration of farmsteads (excact number unknown) occurs to the east of Koster and further to the south in both Corridors C B2 and C B3.

6.2.2 Possible heritage resources

- Stone Age sites with scatters of stone tools may occur along the Matlabas, Crocodile, Elands Rivers, near confluences of rivers and streams, erodod areas, dongas and outcrops suitable for tool manufacturing.
- Some of the unknown number of farmsteads east of Koster and further southwards in both Corridors C B2 and C B3 may hold historical significance.
- Undetected graveyards may occur in the central and southern parts of both Corridors C B2 and C B3.

HERITAGE TYPES	Identified (Y/N)	Spatial presentation
Late Iron Age sites	**Yes**	At least five Late Iron Age sites occur on both sides of the Matlabas River in both Corridors C B2 and C B3
Farmsteads		Unknown number of farmsteads east of Koster and further to the south in both Corridors C B2 and C B3.
Monument and battlefield	**Yes**	Battlefield of Moedwil occured to the north of Moedwil (N4), between Moedwil and Swartruggens

Table 4- Heritage resources positively identified in the central preferred corridors (C B2, C B3) for the Delta (Masa) Epsilon (Selomo) 765kv power lines (above).

HERITAGE TYPES	Identified (Y/N)	Spatial presentation
Stone Age sites	**No**	May occur in stretches of both Corridors C B2 and C B3, along banks of the Matlabas and Crocodile rivers; eroded areas and dongas; near outcrops such as shale, hornfels and dolerites
Farmsteads	**No**	Some of the unknown number of farmsteads east of Koster and further to the south in both Corridor C B2 and C B3 may hold historical significance (and cultural landscapes of small proportions).
Graveyards	**No**	Graveyards may occur in the central and southern parts of Corridors C B2 and C B3

Table 5- Heritage resources which possibly may exist in the central preferred Corridors (C B2, C B3) for the Delta (Masa) Epsilon (Selomo) 765kv power lines (above).

6.3 The eastern corridors and deviations

Two eastern corridors occur, namely Corrridor D and Corridor F. Corridor D also has two deviations, namely Corridor D1 and Corridor D2.

6.3.1 Corridor D

Corridor D runs from the Masa (Delta) Substation in the north southwards across the following main stretches of land, namely:

From Masa (Delta) Substation to the Matlabas River: After leaving the substation the power line bends sharply two times before running southwards across farms such as Nooitgedacht 514, Rietfontein 360, Mabulskop 406 and Rietfontein 15 on the Matlabas River.

From the Matlabas River to the Crocodile River: This stretch runs further southwards crossing amongst others Colchester 17, Klippan 52, Springbokvlei 55, Krugerspan 86KQ, Rooibokvlei 102, Paarl 124 and Sweet home 322 on the southern banks of the Crocodile River.

From the Crocodile River to Varkfontein on the northern edge of the Pilanesberg: This stretch runs from Sweethome 322 across the western extend of the Vlieepoortberge and farms such as De Blaauwen Banken 340, Hartbeestkopje 367 and Moddergat 389 before running to the west of Spitskop and then to Varkfontein 13 on the north-eastern perimeter of the Pilanesberg.

Along the eastern perimeter of the Pilanesberg to Derby: This stretch runs across farms such as Leeuwfontein 35 and Roodebank 64 where it turns sharply to the south-west in order to cross Zanddrift 82, Hartbeesspruit 88 and Goedgedacht 118. Here, it bends to the south-east in order to cross Uitvalgrond 105, Stellite 255, Boekenhoutfontein 260, Uitvalgrond 257, Avondsrus 285, Selonskraal 317,

Doringlaagte 319, Naauwkloof 321, Honingnestkrans 367 and along the eastern perimter of Derby.
From east of Derby to the Selomo (Epsilon) Substation: This stretch runs south-westwards across Dwarsfontein 1, Avondzon 7, Uitkyk 184, Modderfontein 383, Blesbokfontein 211, Witpoort 231 and Welgegund 375 to the substation.

6.3.2 Deviation D1

Deviation D1 runs from south of Thabazimbi to the Pilanesberg across the following farms, from north to south: Langpan 371, Elandskuil 378, Middeldrift 379, Witvley 423, Vaalkop 426, Kwikstaart 431, Wachteenbeetje 435, Zwartwitpensbokfontein 434, Hardekoolpan 439, Pylkop 26, Ramakokskraal 25, Vaderland 63, Rhenosterfontein 86, Rhenosterspruit 908, Frischgewaagd 96, Onderstepoort 96 and Paul Bodenstein Landgoed 57.

6.3.3 Deviation D2

Deviation D2 runs from near Spitskop to the Pilanesberg across the following farms (north to south), namely: Kaalvlakte 415, Leeuwkopje 416, Einde 420, Tussenkomst 15, Rhenosterspruitje 28, Elandslaagte 30, Rhenosterfontein 86, Rhenosterspruit 908, Frischgewaagd 96, Onderstepoort 96 and Paul Bodenstein Landgoed 57.

6.3.4 Corridor F

Corridor F leaves Kromdraai (Kaffirsdraai 531) near Lephalale in the north and runs southwards after two sharp bends. It now crosses the following farms on its route to the Matlabas River, namely: Naauwpoort 363, Klipkloof 365, Olifantkop 398, Doornpan 13 and Woodstock 49 (on the Matlabas).

From the Matlabas River to the Crocodile River Corridor F runs across the following farms, namely: Haarlem Oost 51, Groenrivier 95, Ruigtevley 97, Hoopdal 96, Blaauwpan 133, Zandspruit 138, Zandfonfontein 315, Spitsrand 439, McKipzynrand

428 and Varschvlei 4490 on the Sand River (which joins the Crocodile River futher to the north-west).

South of the Crocodile River Corridor F runs across Paddafontein 375 and Aapieskraal 377 before joining stretches of Corridor D and the southern part of the proposed route for Deviation D1. This stretch of Corridor F crosses the following farms: Kromdraai 424, Kwikstaart 431, Wachteenbeetje 435, Zwartwitpensbokfontein 434, Hardekoolpan 439, Pylkop 26, Ramakokskraal 25, Vijgeboomspruit 29, Vaderland 63, (Rhenosterfontein 86, Rhenosterspruit 908/Zanddrift 82, Goedgedacht 118), Uitvalgrond 105, Stellite 255, Boekenhoutfontein 260, Uitvalgrond 257 Morgenzon 261, Kraalhoek 269, (the corner of Selonskraal 317), Broodskraal 316, Doornlaagte 318 and Roodewal 372.

The southern stretch of Corridor F follows Corridor D and runs to the Epsilon (Selomo) Substation across the following farms, namely: Naauwkloof 321, Honingnestkrans 367, along the eastern perimeter of Derby (Vlakfontein 373), Dwarsfontein 1, Avondzon 7, Uitkyk 184, Modderfontein 383, Blesbokfontein 211, Witpoort 231 and Welgegund 375.

6.3.5 Known heritage resources

The following known types and ranges of heritage resources occur in/near these stretches of the power line corridors, namely:

- As many as four small Late Iron Age occurrences on farms such as Inkerman 10 (1), Springbokvlei 55 (1) and Zandfontein 394 (2) on the Matlabas River in Corridor D. At Zandfontein an unknown type of mineral was mine(mining heritage site) while a Late Iron Age occurrence also exists on this farm.
- An unknown mineral was mined on Sweet Home 322 (mining heritage site).
- No Go Areas occur on Boekenhoutfontein 260 (former residences of Paul Kruger) and Selonskraal 317JQ (mega stone walled complex, Molokwane) in Corridor D.

- The Battle of Vlakfontein (29 May 1901) occurred on the farm Vlakfontein 373, near Derby.
- A concentration of farmsteads (excact number unknown) occurs near Derby and further south in Corridors D and F.

6.3.6 Possible heritage resources

- Stone Age sites with scatters of stone tools may occur along the Crocodile and Matlabas Rivers, near confluences of rivers and streams, erodod areas, dongas and outcrops suitable for tool manufacturing.
- The farm Mabulskop 406 may hold Late Iron Age or historical remains as this kopje may be associated with a ruler from the more recent past (Mabul?).
- Deviation 1 as well as Corridor F runs across the former sphere of influence of the Late Iron Age/historical Kwena Phalane (Ramakokskraal and wider area) which may hold sites with evidence regarding the historical unfolding of this clan.
- Some of the unknown number of farmsteads near Derby and further southwards in Corridors D and F may hold historical significance.

HERITAGE TYPES	Identified (y/n)	Spatial presentation
Late Iron Age sites	**Yes**	**NO GO AREA. Mega stone walled complex on Selonskraal 317in Corridor D**
Historical houses	**Yes**	**NO GO AREA. Residences of Paul Kruger on Boekenhoutfontein 260 in Corridor D and F**
Farmsteads		Unknown number of farmsteads near Derby and furher south in Corridors D and F.
Monument and battlefield	**Yes**	Battlefield of Vlakfontein on Vlakfontein 373 near Derby in Corridors D and F

Table 6- Heritage resources positively identified in the eastern preferred corridors (D, F) and deviations (D1, D2) for the Delta (Masa) Epsilon (Selomo) 765kv power lines (above).

HERITAGE TYPES	Identified (Y/N)	Spatial presentation
Stone Age sites	**No**	May occur in Corridors D and F as well as in deviations along banks of the Matlabas and Crocodile rivers; eroded areas and dongas; near outcrops such as shale, hornfels and dolerites
		Deviation 1 and Corridor F run across the former sphere of influence of the Late Iron Age/historical Kwena Phalane (Ramakokskraal and wider area) which may hold sites with evidence regarding the historical unfolding of this clan.
Farmsteads	**No**	Unknown number of farmsteads in Corridors D and F may hold historical significance (and cultural landscapes of small proportions).
Graveyards	**No**	Graveyards may occur in the central and southern parts of Corridors D and F as well as in Deviations D1 and D2

Table 7- Heritage resources which possibly may exist in the eastern preferred corridors (D, F) and deviations (D1, D2) for the Delta (Masa) Epsilon (Selomo) 765kv power lines (above).

6.4 Heritage resources in the preferred power line corridors and deviations

The Phase I HIA study revealed the presence of the following types and ranges of heritage resources in/near the preferred power line corridors and deviations, namely (Table 8):

- As many as six Late Iron Age stone walled sites on Veeplaats 82 (1), Kromellenbogen 104 (2), Kleinfontein 260 (2) and Rhenosterfontein (1) between Zeerust (west) and Groot Marico (east).
- A monument commemorating the Battle of Kleinfontein (24 October 1902) on Kleinfontein 260.
- An unknown number of farmsteads in the southern part of the Eskom Project Area, particularly near Koster and Derby.
- Five Late Iron Age sites on Leamington 10 (2), Wegdraai 18 (1) and Elysium 395 (2) while another four occur on Inkerman 10 (1), Springbokvlei 55 (1) and Zandfontein 394 (2) on both sides of the Matlabas River. A mining heritage site also occurs on Zandfontein 392.
- The Battle of Moedwil (19 September 1901) occurred in a wide area to the north of Moedwil (N4), between Swartruggens (west) and Moedwil (east).
- A mining heritage site on Sweet Home 322.
- No Go Areas occur on Boekenhoutfontein 260 (former residences of Paul Kruger) and Selonskraal 317JQ (mega stone walled complex, Molokwane).
- The Battle of Vlakfontein (29 May 1901) occurred on the farm Vlakfontein 373, near Derby.

It is also possible that the following types and ranges of heritage resources may occur in/near the proposed power line corridors and deviations, namely (Table 8):

- Stone Age sites with scatters of stone tools may occur along the Crocodile, Marico, Matlabas, Toelani and other rives, near confluences of rivers and streams, erodod areas, dongas and outcrops suitable for tool manufacturing.
- Some of the unknown number of farmsteads in the power line corridors that runs in the southern zone of the Eskom Project Area may hold historical significance. These farmsteads occur in bigger concentrations near Koster and Derby.

- The Marico Bushveld FU Deviation runs along and near the Toelani River where undiscovered sites holding evidence for the historical unfolding of the Late Iron Age/historical Tlokwa may occur.
- Deviation D1 and Corridor F runs across the former sphere of influence of the Kwena Phalane (Ramakokskraal and wider area) where undiscovered sites of this Late Iron Age/historical clan may exist.
- Undetected graveyards may occur in the central and southern parts of the preferred power line corridors and deviations.
- The farm Mabulskop 406 may hold Late Iron Age or historical remains as this kopje may be associated with a ruler from the more recent past (Mabul?).

WESTERN CORRIDOR AND DEVIATIONS		CENTRAL CORRIDOR		EASTERN CORRIDOR AND DEVIATIONS		
Corridor Ba	**Bushveld Marico FU/ & Bushveld**	**C B2**	**C B3**	**Corridor D**	**Corridor F**	**DI and D2**
	Between Matlabas and Crocodile Rivers					
		LIA sites both sides of the Matlabas River		LIA sites both sides of the Matlabas River		
Between Zeerust and Marico		**Between Crocodile River and N4**		**Between Crocodile River and Derby**		
Kleinfontein monument		Moedwil battlefield	Sweet Home, mining heritage site	Boekenhoutfontein Selonskraal (Molokwane)	Boekenhoutfontein	Possible LIA historical Kwena Phalane sites
Kleinfontein battlefield						
LIA/historical Hurutshe sites	Possible LIA/historical Tlokwa sites					
Between Marico/Epsilon		**Between N4/Epsilon**		**Between Derby/Epsilon**		
Farmsteads southwards	Farmsteads southwards	Farmsteads near Koster & southwards	Farmsteads near Koster & southwards	Farmsteads near Derby & southwards Vlakfontein battlefield	Farmsteads near Derby & southwards Vlakfontein battlefield	

Table 8- Identified as well as possible types and ranges of heritage resources in/near the preferred power line corridors and deviations for the Delta (Masa) Epsilon (Selomo) Project (above).

6.5 Ranking the power line corridors and deviations

Considering the presence of the various types and ranges of heritage resources in/near the preferred power line corridors and deviations these alignments can be ranked before mitigtation measures have been applied as well as after mitigtion measures have been applied to heritage resources that may be affected by the proposed power lines.

The scale that was used to rank the power line corridors was ranked in three levels, namely: one (1) (least preferred); two (2) medium preferred and three (3) (most preferred).

6.5.1 Ranking of power line corridors before mitigation

Corridors C B2, C B3, the Bushveld Deviation and Deviation D2 are most preferred as it seems as if these corridors will affect a low number of heritage resources, no outstanding significant heritage resources as well as no No Go Areas (Marathodi is located a considerable distance to the east of C B2 and C B3).

The Marico Bushveld FU Deviation is medium preferred as it possibly runs across a Late Iron Age/historical Tlokwa sphere of influence which may be located along the Toelani River.

Corridor F and Deviation D1 is medium preferred as it possibly runs across a Late Iron Age/historical Kwena Phalane sphere of influence (Ramakokskraal and wider area) where undiscovered sites of this Late Iron Age/historical clan may exist.

Corridor D is least preferred as it runs close to No Go Areas such as Boekenhoutfontein and Selonskraal (Molokwane).

Corridor Ba is least preferred. Corridor Ba runs through the historical Zeerust/Marico area as was well as across a Late Iron Age/historical Hurutshe sphere of influence

affecting several of these sites. The battlefield of Kleinfontein and the memorial commemorating this battle also occur in/near Corridor Ba.

Corridor	Rating	Rationale
Ba	1	Crossing historical Zeerust/Marico; Kleinfontein memorial, Late Iron Age/historical Hurutshe sphere of influence and possible Tlokwa sites along the Toelani River
Marico Bushveld FU Deviation	2	
Bushveld Deviation	3	Affecting smaller probably less significant heritage sites
C B2	3	Affecting smaller probably less significant heritage sites
C B3	3	
D	1	No Go Areas: Boekenhoutfontein and Molokwane
D1	2	Crossing Late Iron Age/historical Kwena Phalane sphere of influence and possible Phalane sites (Ramakokskraal and area)
D2	3	Affecting smaller probably less significant heritage sites
F	2	Crossing Late Iron Age/historical Kwena Phalane sphere of influence and possible Phalane sites (Ramakokskraal and area)

Table 9- Ranking preferred power line corridors and deviations before mitigation measures have been applied [least (1), medium (2) or most (3) preferred corridors] for the Delta (Masa) Epsilon (Selomo) Project. (The rating scheme is based on the presence of significant heritage resources in/near the proposed power line corridors and deviations [above]).

6.5.2 Ranking of power line corridors after mitigation

After mitigation measures have been applied to heritage resources that may be affected by the power lines the power line corridor and deviations can be ranked as follow:

Corridors C B2, C B3, the Bushveld Deviation and Deviation D1 are the most preferred as the few and less significant heritage resources in/near these power line corridors and deviations can be mitigated.

The Marico Bushveld FU Deviation, Corridor F and Deviation D1 are most preferred if the Late Iron Age/historical Tlokwa and Kwena Phalane spheres of influence in/near these corridors and deviations do not prove to be as significant as historical evidence suggest, or if sites belonging to these spheres of influence are limited and mostly falling outside the power line corridors and when the sites which may be affected by the power lines and deviations are limited in numbers and after they have been mitigated.

Corridor D is medium preferred if the power lines can avoid the No Go Areas on Boekenhoutfontein and Selonskraal. Avoidance of these No Go Areas must ensure that these heritage resources are not physically or visually impacted by the power lines.

Corridors Ba is medium preferred if the power lines in this corridor avoid sites belonging to a Late Iron Age/historical Hurutshe sphere of influence or if the sites that may be affected by the power lines are limited in numbers and after they have been mitigated. The battlefield of Kleinfontein remains an intangible heritage feature while the memorial commemorating this battle must be left *in situ* or have to be moved.

Corridor	Rating	Rationale
Ba	2	Crossing historical Zeerust/Marico; Kleinfontein memorial, Late Iron Age/historical Hurutshe sphere of influence and possible Tlokwa sites along the Toelani River
Marico Bushveld FU Deviation	3	
Bushveld Deviation	3	Affecting smaller probably less significant heritage sites
C B2	3	Affecting smaller probably less significant heritage sites
C B3	3	
D	2	No Go Areas: Boekenhoutfontein and Molokwane
D1	3	Crossing Late Iron Age/historical Kwena Phalane sphere of influence and possible Phalane sites (Ramakokskraal and area)
D2	3	Affecting smaller probably less significant heritage sites
F	3	Crossing Late Iron Age/historical Kwena Phalane sphere of influence and possible Phalane sites (Ramakokskraal and area)

Table 10- Ranking the preferred power ine corridors and deviations after mitigation measures have been applied [least (1), medium (2) or most (3) preferred] for the Delta (Masa) Epsilon (Selomo) Project. (The rating scheme is based on the presence of significant heritage resources in/near the proposed power line corridors ([above]).

7 THE SIGNIFICANCE, POTENTIAL IMPACTS ON AND MITIGATION OF THE HERITAGE RESOURCES

The Phase I HIA study for the preferred power line corridors has identified the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in/near the power line corridrors and deviations, namely (Table 8):

- As many as six Late Iron Age stone walled sites on Veeplaats 82 (1), Kromellenbogen 104 (2), Kleinfontein 260 (2), Rhenosterfontein (1) between Zeerust (west) and Groot Marico (east).
- A monument commemorating the Battle of Kleinfontein (24 October 1902) on Kleinfontein 260.
- An unknown number of farmsteads in the southern part of the Eskom Project Area, particularly near Koster and Derby.
- Five small Late Iron Age sites on Leamington 10 (2), Wegdraai 18 (1) and Elysium 395 (2) while another four occur on Inkerman 10 (1), Springbokvlei 55 (1) and Zandfontein 394 (2) on both sides of the Matlabas River. A mining heritage site also occurs on Zandfontein 392.
- The Battle of Moedwil (19 September 1901) occurred in a wide area to the north of Moedwil (N4), between Swartruggens (west) and Moedwil (east).
- A mining heritage site on Sweet Home 322.
- No Go Areas occur on Boekenhoutfontein 260 (former residences of Paul Kruger) and Selonskraal 317JQ (mega stone walled complex, Molokwane).
- The Battle of Vlakfontein (29 May 1901) occurred on the farm Vlakfontein 373, near Derby.

It is also possible that the following types and ranges of heritage resources may occur in/near the proposed power line corridors, namely (Table 8):

- Stone Age sites with scatters of stone tools may along the Crocodile, Marico, Matlabas, Toelani and other rives, near confluences of rivers and streams, erodod areas, dongas and outcrops suitable for tool manufacturing.

- Some of the unknown number of farmsteads in the power line corridors that runs in the southern zone of the Eskom Project Area may hold historical significance. These farmsteads occur in bigger concentrations near Koster and Derby.
- The Marico Bushveld FU Deviation runs along and near the Toelani River where undiscovered sites holding evidence for the historical unfolding of the Late Iron Age/historical Tlokwa may occur.
- Deviation D1 runs across the former sphere of influence of the Kwena Phalane (Ramakokskraal and wider area) where undiscovered sites of this Late Iron Age/historical clan may exist.
- Undetected graveyards may occur in the central and southern parts of the preferred power line corridors and deviations.
- The farm Mabulskop 406 may hold Late Iron Age or historical remains as this kopje may be associated with a ruler from the more recent past (Mabul?).

7.1 The significance of the heritage resources

The significance of the heritage resources which will be affected by the Eskom Project can only be determined after they have been positively identified after the walk-through study has been done and after the realignment of the power lines have occurred as some of these heritage resources may either be avoided by the power lines or may continue to exist (unaffected) in the power line corridors.

The level of significance of each heritage resource will determine what mitigation measures have to be followed before this heritage resource may be affected by the Eskom Project. The nature and extent of the mitigtion measures will again determine the permitting process that has to be followed with the South African Heritage Resources Authority (SAHRA).

The protective status of the various types and ranges of heritage resources that may be affected by the Eskom Project is indicated by means of various sections of the National Heritage Resources Act (No 25 of 1999).

7.1.1 Stone Age sites

A limited number of Stone Age sites have been identified in the Eskom Project Area and none in the proposed power line corridors. This is primarily the result of the fact that few surveys for Stone Age sites have been conducted in the Eskom Project Area. Stone Age sites are also not easy to detect as they may be (partly) buried under the ground and mostly consist of stone tools that are scattered across the surface of the land.

It is clear that Stone Age sites are under represented in the Eskom Project Area and that some of these sites will be found during the walk through study or when the power line corridors are surveyed and constructed.

Rock painting and engravings sites are also rare in the Eskom Project Area. It seems as if none exist in any of the proposed power line corridors and deviations.

Stone Age sites qualify as archaeological remains and are protected by Section 38 of the National Heritage Resources Act (No 25 of 1999).

7.1.2 Stone walled settlements

Most of the Late Iron Age stone walled sites in the Eskom Project Area have been identified in the central part of the project area where they overlap with Sotho-Tswana and Nguni prehistory and history. A number of these sites may be affected by the proposed power line corridors and their deviations .

The No Go Area of Molokwane occur in/near Corridor D, whilst Corridor F skirts the corner of Selonskraal 317, some distance away from Molokwane.

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Stone walled sites qualify as archaeological and historical remains and are protected by Section 38 of the National Heritage Resources Act (No 25 of 1999).

7.1.3 Historical structures

A substantial number of farmsteads have been recorded in the southern part of the Eskom Project Area. A number of these structures occur in the proposed power line corridors, particularly near Koster and Derby. However, it is not clear whether all of these farmsteads, which have been identified from maps and Google imagery and not by means of field observations, do in fact qualify as historical structures. It is not certain whether these infrastructure consists of single or more than one structure, whether they are older than sixty years (historical buildings), in what condition they are (altered, renovated, dilapidated), etc. These and other criteria will determine their level of significance. It is possible that some of these infrastructure may include farmsteads with outbuildings, e.g. wagon sheds, rondavels and graveyards which may constitute cultural landscapes of smaller proportions.

The No Go Area of Boekenhoutfontein 260 occur in/near Corridor D.

Historical structures such as individual houses or farmsteads with outbuildings (sometimes constituting cultural landscapes) which are older than sixty years are protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999).

7.1.4 Memorabilia (including battlefields)

A number of monuments and battlefields were distinguished in and near the border of the Eskom Project Area. At least two battlefields (Moedwil and Vlakfontein) as well as the Battlefield of Kleinfontein (24 October 1902) and the monument erected to commemorate this battle occur in the proposed power line corridors and their deviations.

Memorabilia which include monuments, commemorative beacons or Gardens of Remembrance qualify as a heritage memorials which are protected by Section 37 of the National Heritage Resources Act (No 25 of 1999).

7.1.5 Graveyards

The number of graveyards which were recorded in the Eskom Project Area as well as in the preferred power line corridors (none) is not a true reflection of the real number of graveyards which exist in the Project Area. A number of undetected graveyards may be affected by the Eskom Project as many informal or abandoned graveyards are difficult to detect. Formal, historical graveyards usually occur where colonial settlement took place, such as in the central and southern parts of the Eskom Project Area. It is highly likely that graveyards will be discovered during the walk-through study.

All graveyards and graves can be considered to be of high significance and are protected by various laws. 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 impacts on the heritage resources

Some of the types and ranges of heritage resources in the preferred power line corridors may be impacted (affected, altered, damaged) by the Eskom Project.

The number which may be affected may decrease when the power lines have been realigned after the walk-through study has been completed. The significance of the impacts on the various types and ranges of heritage resources is indicated in Tables 11-15).

7.2.1 Stone Age sites

Stone Age sites generally do not cover large surface areas and can be expected to occur nearly anywhere. No Stone Age sites were recorded along the proposed power line corridors. However, sites will be found when the walk through study is done or when the power line corridors are surveyed and the power lines are constructed. These sites may be impacted when pylons are constructed on top of concentrations of stone artefacts.

Stone tools are not destroyed by this action but are scattered and are disturbed, usually from a context which already have been disturbed by means of natural environmental circumstances that occurred in the past. The disturbance which will be caused by the Eskom Project, however, will be due to human intervention and can not be considered to be a natural process.

7.2.2 Stone walled settlements

Stone walled settlements occur as single sites or as clusters of sites. These sites are allways found in areas where low mountains and hills occur as stone were used as the prime source of building material. However, anomolies may occur such as the site of Marathodi on Vlakfontein 209 which was constructed on level land near low outcropping dolerite dykes. The surface of land that is covered by single (clusters) of stone walled sites vary considerably. Some single sites are large and cover several hectares of land. Clustered compositions of these sites cover several square kilometres and have been identified as the No Go Areas. These sites constitute towns and villages (cultural landscapes and townscapes) and must be avoided at all costs.

A number of stone walled sites occur in the proposed power line corridors. These sites may be impacted if the pylons for the power lines are erected within the perimeters of these sites or when the power lines cuts across or between a cluster of these sites which together may constitute a cultural landscape.

The No Go Area of Molokwane occur in/near Corridor D. Corridor F skirts the corner of Selonskraal on which this stone walled complex is located but needs not to affect the site.

7.2.3 Historical structures

A number of farmsteads, some with associated infrastructure, have been identified in the southern part of the proposed power line corridors, particularly near Koster and Derby. Newly planned power lines are usually designed in such a way as to avoid existing infrastructure. However, when power lines are grouped together such broad corridors may require that historical buildings or part of complexes with historical structures (constituting cultural landscapes) have to be demolished to make way for power lines.

The No Go Area of Boekenhoutfontein 260 occur in/near Corridor D.

7.2.4 Memorabilia (including battlefields)

Battlefields associated with the Transvaal Anglo War (1899-1902) are not neccessarily demarcated areas. Battles that have been fought during this war took place on horse-back and moved across wide areas. Strongholds usually consisted of trenches or rudimentary low stone walls that are not recogniseable any longer. Skirmishes mostly occurred over a period of a few days so that remains of base camps can seldom be found. The most outstanding cultural and historical feature of some battlefields may lay in their intangible heritage attributes.

It seems as if the battlefield where the Battle of Kleinfontein (24 October 1902) took place and the monument commemorating this battle as well as the Battlefields of Moedwil (19 September 1901) and Vlakfontein (29 May 19010 may be crossed by Corridors Ab, Corridors C B2 and C B3 and Corridors D and F.

7.2.5 Graveyards

Graveyards were recorded in the Eskom Project Area and in the proposed power line corridors. More may be discovered during the walk-through study. These graveyards may be impacted when pylons are erected on top of these structures.

7.3 Mitigating the heritage resources

Different mitigation measures have to be followed for different types and ranges of heritage resources that may be affected by the Eskom Project. Mitigation measures for various types and ranges of heritage resources are usually conducted by specialists qualified in various disciplines and accredited with the Association for Southern African Professional Archaeologists (ASAPA).

An important aspect relating to the mitigation (conservation) of heritage resources in power line corridors is the undertaking of walk-through studies for proposed power line corridors. Walk-through studies are done before power lines are constructed and have the following benefits, namely:

- Power lines can be rerouted or realigned in order to avoid (conserve) heritage sites.
- Heritage resources can be conserved unaffected (*in situ*, underneath) power lines and can subsequently be managed as long as power lines are operational.

7.3.1 Stone Age sites

Stone Age sites can in some instances be avoided by means of placing pylons on opposite ends (outer perimeters) of these sites. Stone Age sites therefore can be kept underneath (*in situ*) any number of power lines.

It is also possible that stone tools which may be affected by the Eskom Project can be collected from the surface before the power lines are constructed. These stone tools

can be donated to museums (preferably closest to the project area) or to an accredited institution such as a national museum or a university. Here, it can be safe-kept and be used in displays or in educational programmes.

These Phase II investigations can only be conducted by archaeologists accredited with the Association for Southern African Professional Archaeologists (ASAPA). The archaeologist has to obtain a permit from the South African Heritage Resources Authority (SAHRA) which will authorise the collection of the artefacts *prior* to the construction of the power lines and the subsequent destruction of the archaeological sites.

7.3.2 Stone walled settlements

Stone walled sites can in some instances be avoided by means of placing pylons on opposite ends (outer perimeters) of single or small clusters of stone walled sites. Incorporation of a small cluster of stone walled sites underneath any number of power lines may impact on these cultural landscapes. However, the impact will be visual and not neccessarly physical. No fixed prescriptions exist for 'safe distances' that has to be maintained between power lines and stone walled sites.

The No Go Area of Molokwane in/near Corridor D must be avoided by the power lines in order not to impact physically or visually on this heritage site of outstanding significance.

If stone walls have to be destroyed to make way for pylons these stone walled sites must be subjected to Phase II investigations. These investigations require that stone walls sites be documented by means of mapping the sites and possibly by means of small test excavations of sites. Phase II investigations are done by archaeologists accredited with ASAPA. The archaeologist has to obtain the necessary permit from SAHRA which will authorise the Phase II investigation and subsequent destruction of the stone walled sites before the construction of the power lines commences.

7.3.3 Historical structures

Historical structures such as farmsteads with associated infrastructure and cultural landscapes can in some instances be avoided by means of routing power lines around these structures. Historical infrastructure, however, can not be preserved underneath power lines. Broad power line corridors may be negative to historical farmstead complexes which constitute cultural landscapes of smaller or larger proportions.
Power lines that avoid historical structures may still impact visually on these remains. No fixed prescriptions exist that outline 'safe distances' between power lines and historical structures.

The No Go Area of Boekenhoutfontein 260 in/near Corridor D must be avoided by the power lines in order not to impact physically or visually on this heritage sites of outstanding significance.

Historical structures may not be affected (demolished, renovated, altered) by the Eskom Project *prior* to their investigation by a historical architect in good standing with SAHRA. The historical architect has to acquire a permit from SAHRA before any historical structures may be impacted as a result of the Eskom Project.

7.3.4 Memorabilia (including battlefields)

The monument that is associated with the Battle of Kleinfontein (24 October 1902) must preferably be avoided by the Eskom Project. If the monument, which can also be conserved beneath the power line, has to be moved it must be shifted to a location where it is accessible to the public, tourists and other interested individuals or groups as its holds educational, emotional and other values.

The Battlefields of Moedwil and Vlakfontein merely have intangible heritage value. They are not clearly demarcated and has already been affected by farming activities and development in general.

7.3.5 Graveyards

Graves and graveyards in the Eskom Project Area can be mitigated by following one of the following strategies, namely:

- Graveyards and graves can be conserved *in situ* beneath power lines. Pylons should be erected on opposite ends of graves or graveyards. Consequently, power lines can be strung across and above graves and graveyards. Conserving graves and graveyards in power line corridors create the risk that they may be damaged, accidentally, and that Eskom may be held responsible for such damages. Controlled access must exist for any relatives or friends who wish to visit graves or graveyards in power line corridors.
- Graveyards can also be exhumed and relocated. 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 CONCLUSIONS AND RECOMMENDATIONS

The Phase I HIA study revealed the presence of the following types and ranges of heritage resources in/near the preferred power line corridors and deviations, namely (Table 8):

- As many as six Late Iron Age stone walled sites on Veeplaats 82 (1), Kromellenbogen 104 (2), Kleinfontein 260 (2) and Rhenosterfontein (1) between Zeerust (west) and Groot Marico (east).
- A monument commemorating the Battle of Kleinfontein (24 October 1902) on Kleinfontein 260.
- An unknown number of farmsteads in the southern part of the Eskom Project Area, particularly near Koster and Derby.
- Five Late Iron Age sites on Leamington 10 (2), Wegdraai 18 (1) and Elysium 395 (2) while another four occur on Inkerman 10 (1), Springbokvlei 55 (1) and Zandfontein 394 (2) on both sides of the Matlabas River. A mining heritage site also occurs on Zandfontein 392.
- The Battle of Moedwil (19 September 1901) occurred in a wide area to the north of Moedwil (N4), between Swartruggens (west) and Moedwil (east).
- A mining heritage site on Sweet Home 322.
- No Go Areas occur on Boekenhoutfontein 260 (former residences of Paul Kruger) and Selonskraal 317JQ (mega stone walled complex, Molokwane).
- The Battle of Vlakfontein (29 May 1901) occurred on the farm Vlakfontein 373, near Derby.

It is also possible that the following types and ranges of heritage resources may occur in/near the proposed power line corridors and deviations, namely (Table 8):

- Stone Age sites with scatters of stone tools may occur along the Crocodile, Marico, Matlabas, Toelani and other rives, near confluences of rivers and streams, erodod areas, dongas and outcrops suitable for tool manufacturing.
- Some of the unknown number of farmsteads in the power line corridors that runs in the southern zone of the Eskom Project Area may hold historical significance. These farmsteads occur in bigger concentrations near Koster and Derby.

- The Marico Bushveld FU Deviation runs along and near the Toelani River where undiscovered sites holding evidence for the historical unfolding of the Late Iron Age/historical Tlokwa may occur.
- Deviation D1 and Corridor F runs across the former sphere of influence of the Kwena Phalane (Ramakokskraal and wider area) where undiscovered sites of this Late Iron Age/historical clan may exist.
- Undetected graveyards may occur in the central and southern parts of the preferred power line corridors and deviations.
- The farm Mabulskop 406 may hold Late Iron Age or historical remains as this kopje may be associated with a ruler from the more recent past (Mabul?).

The significance of the heritage resources

The significance of the heritage resources which will be affected by the Eskom Project can only be determined after they have been positively identified after the walk-through study has been done and after the realignment of the power lines have occurred as some of these heritage resources may either be avoided by the power lines or may continue to exist (unaffected) in the power line corridors.

The level of significance of each heritage resource will determine what mitigation measures have to be followed before this heritage resource may be affected by the Eskom Project. The nature and extent of the mitigtion measures will again determine the permitting process that has to be followed with the South African Heritage Resources Authority (SAHRA).

The protective status of the various types and ranges of heritage resources that may be affected by the Eskom Project is indicated by means of various sections of the National Heritage Resources Act (No 25 of 1999).

Stone Age sites

A limited number of Stone Age sites have been identified in the Eskom Project Area and none in the proposed power line corridors. This is primarily the result of the fact that few surveys for Stone Age sites have been conducted in the Eskom Project Area.

Stone Age sites are also not easy to detect as they may be (partly) buried under the ground and mostly consist of stone tools that are scattered across the surface of the land.

It is clear that Stone Age sites are under represented in the Eskom Project Area and that some of these sites will be found during the walk through study or when the power line corridors are surveyed and constructed.

Rock painting and engravings sites are also rare in the Eskom Project Area. It seems as if none exist in any of the proposed power line corridors and deviations.

Stone Age sites qualify as archaeological remains and are protected by Section 38 of the National Heritage Resources Act (No 25 of 1999).

Stone walled settlements

Most of the Late Iron Age stone walled sites in the Eskom Project Area have been identified in the central part of the project area where they overlap with Sotho-Tswana and Nguni prehistory and history. A number of these sites may be affected by the proposed power line corridors and their deviations .

The No Go Area of Molokwane occur in/near Corridor D, whilst Corridor F skirts the corner of Selonskraal 317, some distance away from Molokwane.

Stone walled sites qualify as archaeological and historical remains and are protected by Section 38 of the National Heritage Resources Act (No 25 of 1999).

Historical structures

A substantial number of farmsteads have been recorded in the southern part of the Eskom Project Area. A number of these structures occur in the proposed power line corridors, particularly near Koster and Derby. However, it is not clear whether all of these farmsteads, which have been identified from maps and Google imagery and not by means of field observations, do in fact qualify as historical structures. It is not certain

whether these infrastructure consists of single or more than one structure, whether they are older than sixty years (historical buildings), in what condition they are (altered, renovated, dilapidated), etc. These and other criteria will determine their level of significance. It is possible that some of these infrastructure may include farmsteads with outbuildings, e.g. wagon sheds, rondavels and graveyards which may constitute cultural landscapes of smaller proportions.

The No Go Area of Boekenhoutfontein 260 occur in/near Corridor D.

Historical structures such as individual houses or farmsteads with outbuildings (sometimes constituting cultural landscapes) which are older than sixty years are protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999).

Memorabilia (including battlefields)

A number of monuments and battlefields were distinguished in and near the border of the Eskom Project Area. At least two battlefields (Moedwil and Vlakfontein) as well as the Battlefield of Kleinfontein (24 October 1902) and the monument erected to commemorate this battle occur in the proposed power line corridors and their deviations.

Memorabilia which include monuments, commemorative beacons or Gardens of Remembrance qualify as a heritage memorials which are protected by Section 37 of the National Heritage Resources Act (No 25 of 1999).

Graveyards

The number of graveyards which were recorded in the Eskom Project Area as well as in the preferred power line corridors (none) is not a true reflection of the real number of graveyards which exist in the Project Area. A number of undetected graveyards may be affected by the Eskom Project as many informal or abandoned graveyards are difficult to detect. Formal, historical graveyards usually occur where colonial settlement took

place, such as in the central and southern parts of the Eskom Project Area. It is highly likely that graveyards will be discovered during the walk-through study.

All graveyards and graves can be considered to be of high significance and are protected by various laws. 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 impacts on the heritage resources

Some of the types and ranges of heritage resources in the preferred power line corridors may be impacted (affected, altered, damaged) by the Eskom Project.

The number which may be affected may decrease when the power lines have been realigned after the walk-through study has been completed. The significance of the impacts on the various types and ranges of heritage resources is indicated in Tables 11-15).

Stone Age sites

Stone Age sites generally do not cover large surface areas and can be expected to occur nearly anywhere. No Stone Age sites were recorded along the proposed power line corridors. However, sites will be found when the walk through study is done or when the power line corridors are surveyed and the power lines are constructed. These sites may be impacted when pylons are constructed on top of concentrations of stone artefacts.

Stone tools are not destroyed by this action but are scattered and are disturbed, usually from a context which already have been disturbed by means of natural environmental circumstances that occurred in the past. The disturbance which will be

caused by the Eskom Project, however, will be due to human intervention and can not be considered to be a natural process.

Stone walled settlements

Stone walled settlements occur as single sites or as clusters of sites. These sites are allways found in areas where low mountains and hills occur as stone were used as the prime source of building material. However, anomolies may occur such as the site of Marathodi on Vlakfontein 209 which was constructed on level land near low outcropping dolerite dykes. The surface of land that is covered by single (clusters) of stone walled sites vary considerably. Some single sites are large and cover several hectares of land. Clustered compositions of these sites cover several square kilometres and have been identified as the No Go Areas. These sites constitute towns and villages (cultural landscapes and townscapes) and must be avoided at all costs.

A number of stone walled sites occur in the proposed power line corridors. These sites may be impacted if the pylons for the power lines are erected within the perimeters of these sites or when the power lines cuts across or between a cluster of these sites which together may constitute a cultural landscape.

The No Go Area of Molokwane occur in/near Corridor D. Corridor F skirts the corner of Selonskraal on which this stone walled complex is located but needs not to affect the site.

Historical structures

A number of farmsteads, some with associated infrastructure, have been identified in the southern part of the proposed power line corridors, particularly near Koster and Derby. Newly planned power lines are usually designed in such a way as to avoid existing infrastructure. However, when power lines are grouped together such broad corridors may require that historical buildings or part of complexes with historical structures (constituting cultural landscapes) have to be demolished to make way for power lines.

The No Go Area of Boekenhoutfontein 260 occur in/near Corridor D.

Memorabilia (including battlefields)

Battlefields associated with the Transvaal Anglo War (1899-1902) are not neccessarily demarcated areas. Battles that have been fought during this war took place on horse-back and moved across wide areas. Strongholds usually consisted of trenches or rudimentary low stone walls that are not recogniseable any longer. Skirmishes mostly occurred over a period of a few days so that remains of base camps can seldom be found. The most outstanding cultural and historical feature of some battlefields may lay in their intangible heritage attributes.

It seems as if the battlefield where the Battle of Kleinfontein (24 October 1902) took place and the monument commemorating this battle as well as the Battlefields of Moedwil (19 September 1901) and Vlakfontein (29 May 19010 may be crossed by Corridors Ab, Corridors C B2 and C B3 and Corridors D and F.

Graveyards

Graveyards were recorded in the Eskom Project Area and in the proposed power line corridors. More may be discovered during the walk-through study. These graveyards may be impacted when pylons are erected on top of these structures.

Mitigating the heritage resources

Different mitigation measures have to be followed for different types and ranges of heritage resources that may be affected by the Eskom Project. Mitigation measures for various types and ranges of heritage resources are usually conducted by specialists qualified in various disciplines and accredited with the Association for Southern African Professional Archaeologists (ASAPA).

An important aspect relating to the mitigation (conservation) of heritage resources in power line corridors is the undertaking of walk-through studies for proposed power line corridors. Walk-through studies are done before power lines are constructed and have the following benefits, namely:

- Power lines can be rerouted or realigned in order to avoid (conserve) heritage sites.
- Heritage resources can be conserved unaffected (*in situ*, underneath) power lines and can subsequently be managed as long as power lines are operational.

Stone Age sites

Stone Age sites can in some instances be avoided by means of placing pylons on opposite ends (outer perimeters) of these sites. Stone Age sites therefore can be kept underneath (*in situ*) any number of power lines.

It is also possible that stone tools which may be affected by the Eskom Project can be collected from the surface before the power lines are constructed. These stone tools can be donated to museums (preferably closest to the project area) or to an accredited institution such as a national museum or a university. Here, it can be safe-kept and be used in displays or in educational programmes.

These Phase II investigations can only be conducted by archaeologists accredited with the Association for Southern African Professional Archaeologists (ASAPA). The archaeologist has to obtain a permit from the South African Heritage Resources Authority (SAHRA) which will authorise the collection of the artefacts *prior* to the construction of the power lines and the subsequent destruction of the archaeological sites.

Stone walled settlements

Stone walled sites can in some instances be avoided by means of placing pylons on opposite ends (outer perimeters) of single or small clusters of stone walled sites. Incorporation of a small cluster of stone walled sites underneath any number of power lines may impact on these cultural landscapes. However, the impact will be visual and not neccessarly physical. No fixed prescriptions exist for 'safe distances' that has to be maintained between power lines and stone walled sites.

The No Go Area of Molokwane in/near Corridor D must be avoided by the power lines in order not to impact physically or visually on this heritage site of outstanding significance.

If stone walls have to be destroyed to make way for pylons these stone walled sites must be subjected to Phase II investigations. These investigations require that stone walls sites be documented by means of mapping the sites and possibly by means of small test excavations of sites. Phase II investigations are done by archaeologists accredited with ASAPA. The archaeologist has to obtain the necessary permit from SAHRA which will authorise the Phase II investigation and subsequent destruction of the stone walled sites before the construction of the power lines commences.

Historical structures

Historical structures such as farmsteads with associated infrastructure and cultural landscapes can in some instances be avoided by means of routing power lines around these structures. Historical infrastructure, however, can not be preserved underneath power lines. Broad power line corridors may be negative to historical farmstead complexes which constitute cultural landscapes of smaller or larger proportions.

Power lines that avoid historical structures may still impact visually on these remains. No fixed prescriptions exist that outline 'safe distances' between power lines and historical structures.

The No Go Area of Boekenhoutfontein 260 in/near Corridor D must be avoided by the power lines in order not to impact physically or visually on this heritage sites of outstanding significance.

Historical structures may not be affected (demolished, renovated, altered) by the Eskom Project *prior* to their investigation by a historical architect in good standing with SAHRA. The historical architect has to acquire a permit from SAHRA before any historical structures may be impacted as a result of the Eskom Project.

Memorabilia (including battlefields)

The monument that is associated with the Battle of Kleinfontein (24 October 1902) must preferably be avoided by the Eskom Project. If the monument, which can also be conserved beneath the power line, has to be moved it must be shifted to a location where it is accessible to the public, tourists and other interested individuals or groups as its holds educational, emotional and other values.

The Battlefields of Moedwil and Vlakfontein merely have intangible heritage value. They are not clearly demarcated and has already been affected by farming activities and development in general.

Graveyards

Graves and graveyards in the Eskom Project Area can be mitigated by following one of the following strategies, namely:

- Graveyards and graves can be conserved *in situ* beneath power lines. Pylons should be erected on opposite ends of graves or graveyards. Consequently, power lines can be strung across and above graves and graveyards. Conserving graves and graveyards in power line corridors create the risk that they may be damaged, accidentally, and that Eskom may be held responsible for such damages. Controlled access must exist for any relatives or friends who wish to visit graves or graveyards in power line corridors.
- Graveyards can also be exhumed and relocated. 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.

Ranking of power line corridors

Before mitigation

Corridors C B2, C B3, the Bushveld Deviation and Deviation D2 are most preferred as it seems as if these corridors will affect a low number of heritage resources, no outstanding significant heritage resources as well as no No Go Areas (Marathodi is located a considerable distance to the east of C B2 and C B3).

The Marico Bushveld FU Deviation is medium preferred as it possibly runs across a Late Iron Age/historical Tlokwa sphere of influence which may be located along the Toelani River.

Corridor F and Deviation D1 is medium preferred as it possibly runs across a Late Iron Age/historical Kwena Phalane sphere of influence (Ramakokskraal and wider area) where undiscovered sites of this Late Iron Age/historical clan may exist.

Corridor D is least preferred as it runs close to No Go Areas such as Boekenhoutfontein and Selonskraal (Molokwane).

Corridor Ba is least preferred. Corridor Ba runs through the historical Zeerust/Marico area as was well as across a Late Iron Age/historical Hurutshe sphere of influence affecting several of these sites. The battlefield of Kleinfontein and the memorial commemorating this battle also occur in/near Corridor Ba.

After mitigation

After mitigation measures have been applied to heritage resources that may be affected by the power lines the power line corridor and deviations can be ranked as follow:

Corridors C B2, C B3, the Bushveld Deviation and Deviation D1 are the most preferred as the few and less significant heritage resources in/near these power line corridors and deviations can be mitigated.

The Marico Bushveld FU Deviation, Corridor F and Deviation D1 are most preferred if the Late Iron Age/historical Tlokwa and Kwena Phalane spheres of influence in/near these corridors and deviations do not proof to be as significant as historical evidence suggest, or if sites belonging to these spheres of influence are limited and mostly falling outside the power line corridors and when the sites which may be affected by the power lines and deviations are limited in numbers and after they have been mitigated.

Corridor D is medium preferred if the power lines can avoid the No Go Areas on Boekenhoutfontein and Selonskraal. Avoidance of these No Go Areas must ensure that these heritage resources are not physically or visually impacted by the power lines.

Corridors Ba is medium preferred if the power lines in this corridor avoid sites belonging to a Late Iron Age/historical Hurutshe sphere of influence or if the sites that may be affected by the power lines are limited in numbers and after they have been mitigated. The battlefield of Kleinfontein remains an intangible heritage feature while the memorial commemorating this battle must be left *in situ* or have to be moved.

Impacts of power lines on heritage resources

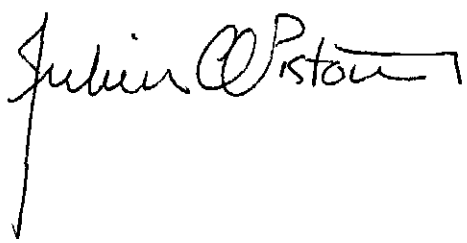
Two main types of impacts can be distinguished with regard to heritage resources and power lines, namely:

- Physical impacts which occur when pylons are constructed on top of heritage resources which exist on the surface of the earth..
- Visual impacts occur when power line infrastructure affects the aesthetic and visual appearance, sense of place, context, or other aspects relating to heritage resources in a negative way.

The significance of impact of power lines on heritage resources vary if single power lines are kept in a corridor or when a varying number of power lines are grouped together in a single corridor creating increasing wider corridors filled with more than one power line as well as many pylons that have to carry these power lines.

The higher the number of pylons in a power line corridor the higher the physical impact of the footprints of the pylons on the earth will be. More than one power line grouped together are visually more discernable than a single power line and should cause a higher visual impact.

The positive and negative impacts of three types of power line corridors (narrow, one or two power lines), medium (three power lines) and broad power line corridors (six power lines) are outlined in Table 1.



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Woodstock 397JP, Buffelshoek 325JQ, Hoogenbomen 232JP Doornspruit 106JQ, Tweerivier 253JQ, Shylock 256, Krokodildrift 217JP, Holfontein 160JP, Vogelfontein 400JP, Bultfontein 204JP, Leeuwkop 140JP, Mabeskraal 161JP, Tweedepoort 283JQ, Bestershoek 227JP, Modderkuil 39JQ and Doornspruit 106JQ,

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10 SPOKESPERSONS CONSULTED

Kruger Robbertse. Sweet Home. (Tel nr. 083709966).

Kobus Robbertse. Elandsfontein en Waterval.. (Tel nr. 0822675851).

Leon De Wit. Koedoeskop. (Tel nr. 0836752289).

Andrei Neethling. Thaba Tholo. (Tel nr. 0826012979 and 0147798825).

Phillip Ellis. Diamand 1, Vaalfontein (Morongkop en Mabulskop). (Tel nr. 0835576444).

Elias Pilane. Local chief and community leader, Motlhabe village. Pilanesberg.

Sameul Sebole (Mponyane). Member of the Kgatla community in Motlhabane.

Seti (surname unknown), employee at Boynton Platinum. Community member in the village of Ntsana-le-metsing, Pilanesberg.

Numerous *badisa* (cattle herders) working in tribal areas across the Eskom Project Area.