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HERITAGE & GRAVE
RELOCATION CONSULTANTS

Zitholele Consulting

Pongola–Candover 132kV power line, upgrades to the Pongola Substation and Candover switching station, development of the Golela 132/22 kV substation

Phase 1 – Heritage Impact Assessment

Issue Date: 1 November 2012

Revision No.: 1

Project No.:

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Declaration of Independence

The report has been compiled by PGS Heritage & Grave Relocation Consultants an appointed Heritage Specialist for Zitholele Consulting. The views stipulated in this report are purely objective and no other interests are displayed during the decision making processes discussed in the Heritage Impact Assessment Process that includes the Baseline Information report as well as this final report

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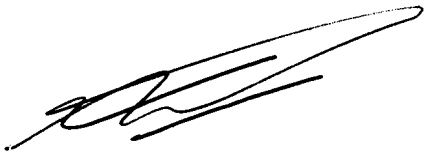

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ACKNOWLEDGEMENT OF RECEIPT

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Date:	*01 11 2012*
Document Title:	Heritage Impact Assessment: Pongola–Candover 132kV power line, upgrades to the Pongola Substation and Candover switching station, development of the Golela 132/22 kV substation
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Revision Number:	*#1*
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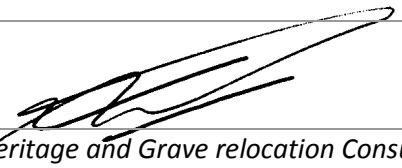
Signature:	
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EXECUTIVE SUMMARY

PGS Heritage & Grave Relocation Consultants was appointed by Zitholele Consulting to undertake a Heritage Impact Assessment (HIA) that forms part of the Basic Environmental Assessment (BA) for the proposed Pongola–Candover 132kV power line, upgrades to the Pongola Substation and Candover switching station, development of the Golela 132/22 kV substation and linking 132kV transmission lines in the uPhongola and Jozini Local Municipalities.

Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant. The Heritage Background Report and field assessment has shown that the study area and surrounding area has a rich historical and archaeological history.

Local communities were questioned about graves and other sacred/heritage sites, and no such sites could be confirmed by the communities in the vicinity of the alignments. It was further indicated that burials mostly took place in existing municipal cemeteries and not in tribal or farms cemeteries.

As the purpose of the site evaluation was to identify the most feasible alignment from a heritage perspective, from the impact significance ratings the most feasible alignments are the western and northern route alignments.

The next step is the compilation of a site specific heritage management plan will be an archaeological walk down and a Phase 1 palaeontological assessment of the final designed alignment to identify all heritage resources to be impacted by the final route alignment and pylon placments. The studies will provide timeous management of such site through realignment of the development or mitigation of such sites where needed.

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1 INTRODUCTION

PGS Heritage & Grave Relocation Consultants was appointed by Zitholele Consulting to undertake a Heritage Impact Assessment (HIA), that forms part of the Basic Environmental Assessment (BA) for the proposed Pongola–Candover 132kV power line, upgrades to the Pongola Substation and Candover switching station, development of the Golela 132/22 kV substation and linking 132kV transmission lines in the uPhongola and Jozini Local Municipalities.

1.1 Scope of the Study

The aim of the study is to identify possible heritage sites and finds that may occur in the proposed development area, and propose mitigation measures to minimise the impact on heritage resources. The Heritage Impact Assessment aims to inform the BA in the development of a comprehensive EMP to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

This background information document aims to provide a broad background on the heritage sensitive areas with in the study area, as identified from available published data.

1.2 Specialist Qualifications

This Heritage Impact AssessmentReport was compiled by PGS Heritage & Grave Relocation Consultants (PGS).

The staff at PGS has a combined experience of nearly 40 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

Wouter Fourie, Principal Archaeologist and Heritage Specialist for this project, and field archaeologist, Marko Hutton, are both registered with the Association of Southern African Professional Archaeologists (ASAPA) and have CRM accreditation with the said organisation.

Dr Gideon Groenewald holds a PhD in Geology from the Nelson Mandela Metropolitan University (1996) and aNational Diploma in Nature Conservation from the University of South Africa (1990). He specialises in research on South African Permian and Triassic sedimentology and macrofossils with an interest in biostratigraphy, and palaeoecological aspects. He has extensive experience in the locating of fossil material in the Karoo Supergroup and has more than 20 years of experience in locating, collecting and curating fossils, including exploration field trips in search of new localities in the southern, western, eastern and north-eastern parts of the country. His publication record includes multiple articles in internationally recognized journals. Dr Groenewald is accredited by the Palaeontological Society of Southern Africa (society member for 25 years).

1.3 Assumptions and Limitations

The Heritage Impact Report deals with available published data and cannot be utilised as the final information on heritage resources in the study area. The assumption is that this report will inform the development of two possible corridor alignments for the final power line, and that this final alignment will require a walkdown when the route alignment and pylon placements have been finalised.

1.4 Legislative Context

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

i. National Environmental Management Act (NEMA) Act 107 of 1998
ii. National Heritage Resources Act (NHRA) Act 25 of 1999
iii. KwaZulu Natal Heritage Resources Act 4 of 2008
iv. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
v. Development Facilitation Act (DFA) Act 67 of 1995

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

i. National Environmental Management Act (NEMA) Act 107 of 1998
    a. Basic Environmental Assessment (BEA) – Section (23)(2)(d)
    b. Environmental Scoping Report (ESR) – Section (29)(1)(d)

c. Environmental Impacts Assessment (EIA) – Section (32)(2)(d)
d. Environmental Management Plan (EMP) – Section (34)(b)

ii. National Heritage Resources Act (NHRA) Act 25 of 1999
a. Protection of Heritage resources – Sections 34 to 36; and
b. Heritage Resources Management – Section 38

iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
a. Section 39(3)

iv. Development Facilitation Act (DFA) Act 67 of 1995
a. The GNR.1 of 7 January 2000: Regulations and rules in terms of the Development Facilitation Act, 1995. Section 31.

The NHRA stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34 (1) of the NHRA states that "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…". The NEMA (No 107 of 1998) states that an integrated EMP should (23:2 (b)) "…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage". In accordance with legislative requirements and EIA rating criteria, the regulations of SAHRA and ASAPA have also been incorporated to ensure that a comprehensive legally compatible AIA report is compiled.

Terminology

Abbreviations	***Description***
AIA	Archaeological Impact Assessment
AMAFA	Amafa aKwaZulu-Natali – Provincial Heritage Authority
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment

I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
PSSA	Palaeontological Society of South Africa
ROD	Record of Decision
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency

Archaeological resources

This includes:

i. material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;

ii. rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;

iii. wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;

iv. features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in achange to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

i. construction, alteration, demolition, removal or change in use of a place or a structure at a place;
ii. carrying out any works on or over or under a place;
iii. subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
iv. constructing or putting up for display signs or boards;
v. any change to the natural or existing condition or topography of land; and
vi. any removal or destruction of trees, or removal of vegetation or topsoil

Early Stone Age

The archaeology of the Stone Age between 400 000 and 2500 000 years ago.

Fossil

Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage

That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage resources

This means any place or object of cultural significance

Holocene

The most recent geological time period which commenced 10 000 years ago.

Late Stone Age

The archaeology of the last 30 000 years associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800's, associated with iron working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30-300 000 years ago associated with early modern humans.

Palaeontology

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

Refer to **Appendix C** for further discussions on heritage management and legislative frameworks

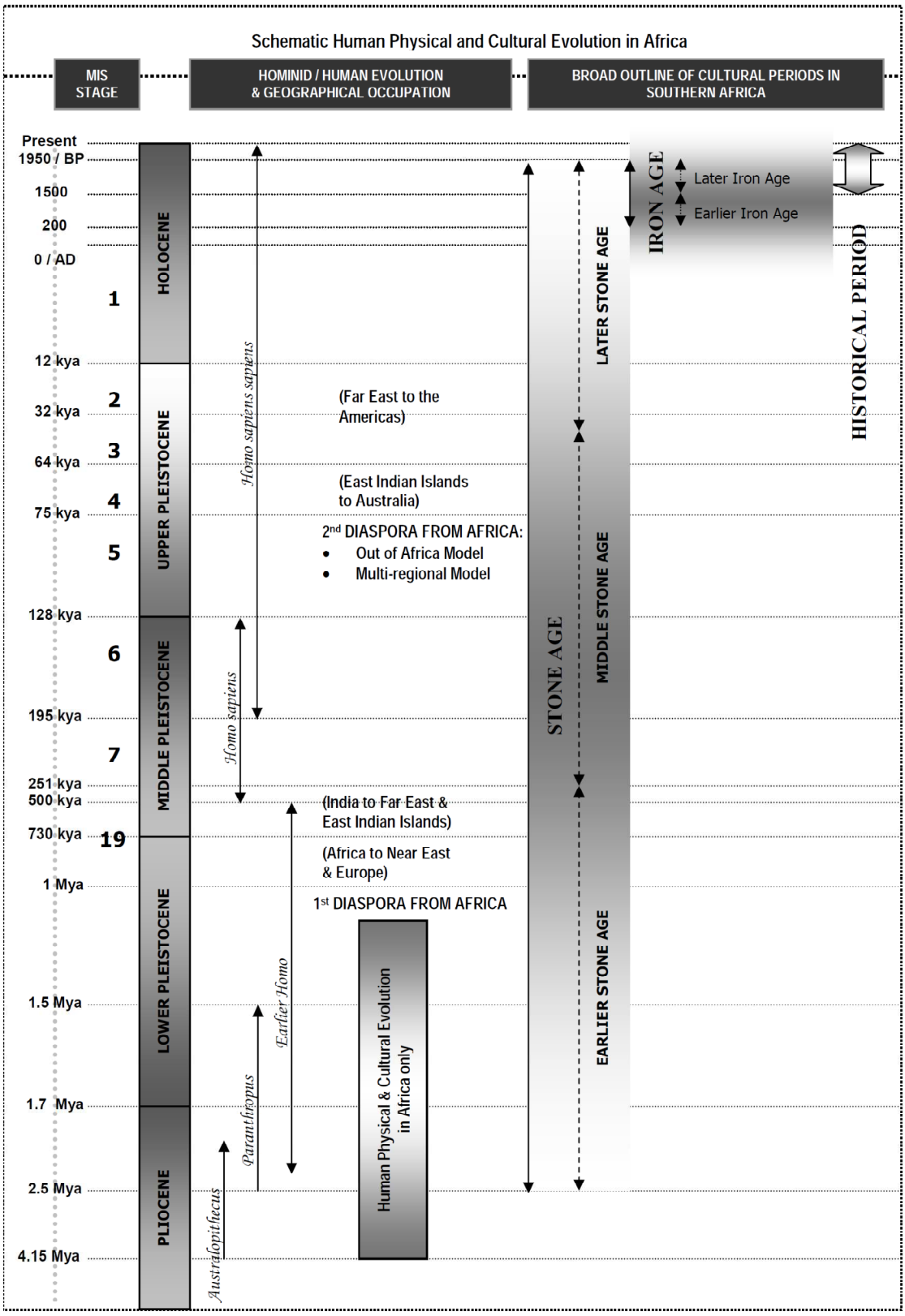

Figure 1 – Human and Cultural Time line in Africa (Morris, 2008)

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Site Location and Description

Location	(S28.28808 E23.78031), The area covers a diverse topography between Pongola and Mkhuze and runs down the western boundary of the Pongolapoort Dam
Land	60 000 Hectares of land under option.
Land Description	Large tracts of land areutilised for game farming and conservation. Some of the land is still utilised for farming and is dotted with tribal lands.

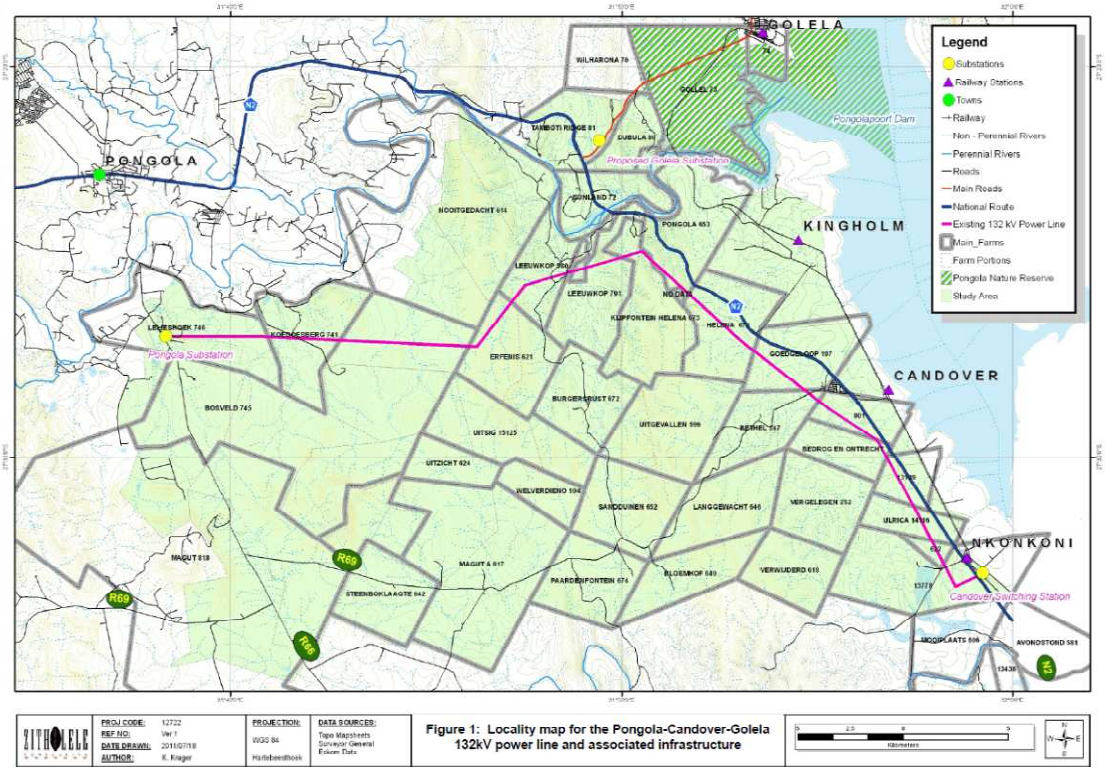

Figure 2 – Study area locality

2.2 Technical Project Description

With the construction of three proposed new 132kV substations for the supply of the greater Makhathini area, viz. Ndumo, Gezisa and Mbazwana substations, the existing Pongola-Candover 132kV line will be overloaded by 2013. Should the existing Pongola-Candover 132kV line be out of service for whatever reason then Makhathini, Gezisa, Ndumo and Nondabuya loads will be shed resulting in an inevitable loss of supply on the greater Makhatini area and an unacceptable service to customers.

In addition, the current service demand in the Golela area has increased over recent years, and is predicted to increase further beyond the capacity of the current distribution capacity. The provision of services in the Golela area needs to be supplemented and strengthened. In order to meet these objectives two projects are proposed, and are discussed below.

2.2.1 Proposed projects

In order to enhance the security of supply for the Makhatini substations of Ndumo, Gezisa and Mbazwana:

- A second 132kV line from Pongola to Candover needs to be constructed; and
- The Pongola substation and Candover switching station need modification to accommodate the additional power line.

In addition, to accommodate the electrical load centre for developments within the vicinity of the Golela border post:

- A 132kV power line and substation is also required to tee-off from the existing Mkuze-Pongola 132kV power line (also called Mkuze-Pongola line 1); and
- This substation is required to be located close to the turn-off from the N2 to the road leading to the Golela border post with Swaziland.

3 BACKGROUND INFORMATION - HERITAGE

3.1 Site Description

The Archival findings

The archival research focused on available information sources, whichwereused to compile a background history of the study area and surrounds. This data then informed the possible heritage resources to be expected during field surveying.

Archaeological background

The archaeology of KwaZulu-Natal spans three archaeological periods: the Stone Age, Iron Age and Historical/Colonial period. The early periods in the Stone Age archaeology of the region are recorded, amongst others, in Sibudu Cave on the coast

of KwaZulu-Natal, which shows evidence for early forms of cognitive human behavioural patterns in the Middle Stone Age of South Africa some 40 000 years BP (Wadley, 2005). The caves, plains, valleys and hills of KwaZulu-Natal are known to once have been occupied by the San people. Evidence for this includes stone artefacts and an abundance of rock art, predominantly in the form of rock paintings in areas such as the Giants Castle and Kamberg in the Drakensburg Mountains (Vinnicombe, 1976). Rock art sites have been also been documented in the areas around Estcourt, Mooi River and Dundee.

Stone Age

The Stone Age can be roughly divided into three periods:

Earlier Stone Age (400 000 – 2 million Before Present/BP)
Middle Stone Age (30 000 – 300 000 BP)
Later Stone Age (30 000 BP – recent times)

Border Cave

Border Cave is situated some 40 kilometers to the north east of the study area at the Ingodini Border Cave Museum Complex. The site is probably the most well-known archaeological site in the larger Pongola area and is a tourist attraction.

The site was first investigated by Raymond Dart in 1934. His excavations exposed a thick deposit of archaeological material dating from the Iron Age overlaying Middle Stone Age (MSA) artefacts. During the early 1940s the archaeological deposits were disturbed by guano collectors.

The guano excavations revealed bone fragments that were forwarded to Dart, in 1941. The remains were that of a human infant dating back to around 100 000 years ago. A single perforated Conus shell was found with the infant remains (Wells, 1945).

Further excavations by Beaumont in the early 1970's exposed a complete MSA sequence succeededby Early and Later Iron Age deposits. The Iron Age deposits datebetween 200-800BP, with the MSA stratigraphy dating from 130 000 to 35 000BP (Klein, 1977).

Iron Age

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the Pre-Historic and Historic periods. It can be divided into three distinct periods:

The Early Iron Age: Most of the first millennium AD.
The Middle Iron Age: 10th to 13th centuries AD
The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. Iron is a very hard metal to work with compared to gold and copper, which have lower melting temperatures and therefore are easier to forge. However, a drawback of gold and copper isthe occurrence of the ore, which is relatively limited compared to iron.

In Africa, we proceeded technologically directly from the Stone Age to the Iron Age, whereas in Eurasia there was a prolonged Copper and Bronze Age preceding the Iron Age. In southern Africa, metallurgical techniques made their first appearance in a rather advanced state that permitted the smelting of Copper and Iron directly after a Stone Age economic way of life.

This scenario provides a strong argument that metallurgical technology was introduced from elsewhere and did not develop locally. To effectively smelt iron oxide ore by reduction requires a temperature of at least 1100°C, that is 400°C below the metal's melting point. To obtain a temperature this high was probably unattainable in ancient furnaces. But the prolonged heating of ore in contact with abundant charcoal, needed to obtain a sufficiently high temperature for the reduction of the oxide ores, enabled the iron to obtain enough carbon to make it into mild steel. If this mild steel is repeatedly heated and hammered during the forging process, it will harden.

Early Iron Age

Early in the first millennium AD, there seems to be a significant change in the archaeological record of the greater part of eastern and southern Africa, lying between the equator and Natal. This change is marked by the appearance of a characteristic ceramic style that belongs

to a single stylistic tradition. These Early Iron Age people practiced a mixed farming economy and had the technology to work metals like iron and copper.

A meaningful interpretation of the Early Iron Age has been hampered by the uneven distribution of research conducted so far; this can be partly attributed to the poor preservation of these early sites.

Linguistic and archaeological research has developed a commonly accepted theoretical model of Bantu distribution from Central Africa down towards Southern Africa from around 1000 BC to 500 AD. This model is believed tohave resulted in the current tribal distribution as known today (**Figure 3**).

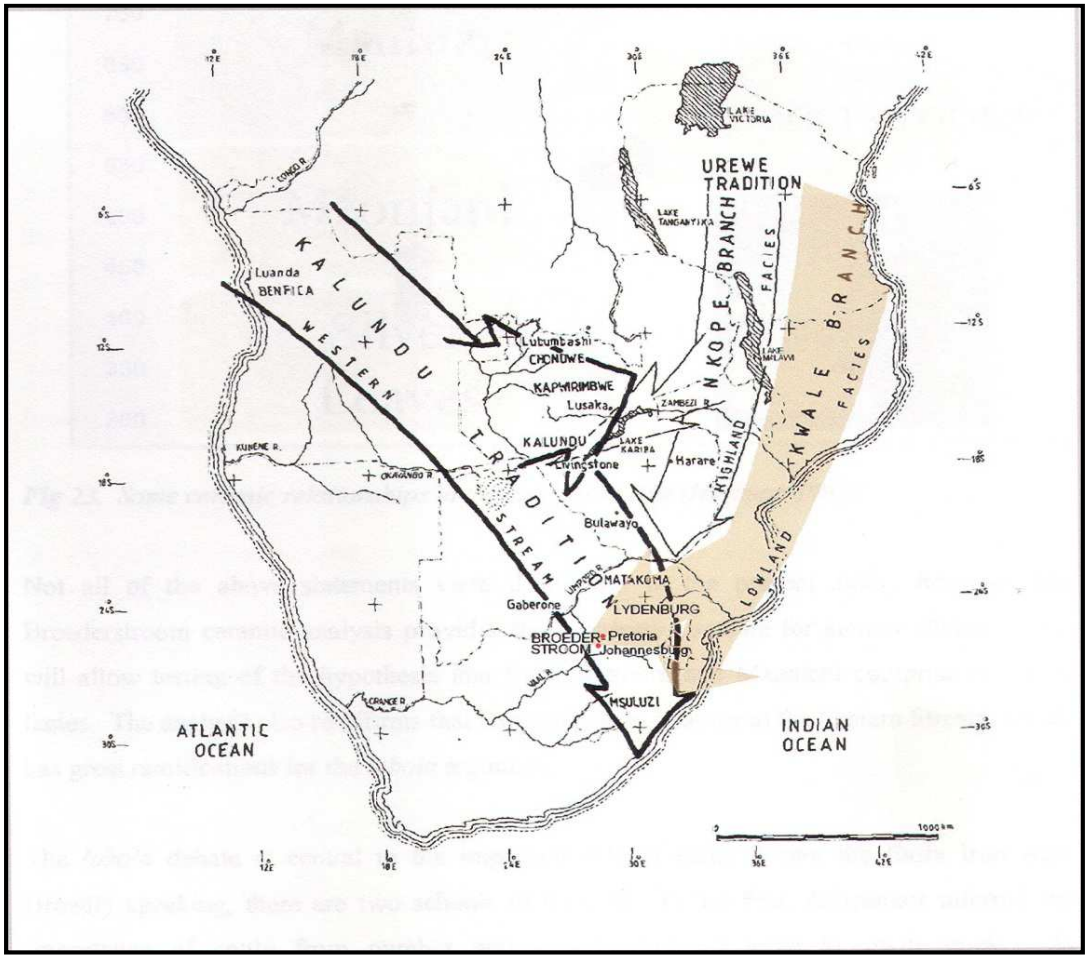

Figure 3 - Map of Western and Eastern Bantu movements from the Central Lakes area

Late Iron Age background

The second period of occupation in KwaZulu-Natal was during the **Early and Middle Iron Age**; an occupation of the KwaZulu-Natal region by the Bantu speakers who are thought to have migrated from as far as the Great Lakes regions of Congo and Cameroon. Existing evidence dates the Iron Age in southern Africa to the first millennium AD (Huffman, 2007). The site of Mzonjani, 15 km from Durban, is the oldest known Iron Age site in KwaZulu-Natal, dating to the 3rd Millennium AD (Huffman, 2007).

Archaeologically, the Natal area of current day KwaZulu-Natal was occupied by the Zulu people by AD 1050 (Huffman, 2007). These findings are backed by historical accounts, oral traditions, the study of linguistics, as well as anthropological and archaeological data (as presented through material culture and artefacts). The archaeological evidence of the Iron Age people in the region is represented through distinct ceramic traditions, stone walls and other structural features such as grain bins and hut floor remains, kraal remains, vitrified cattle dung (sheep and goat), iron implements, slags, bellows and furnaces. The area that was occupied by the Nguni speaking group of the Eastern Bantu language stream is characterised by settlement patterns defined as the Central Cattle Pattern (CCP) (Huffman, 2007). The earliest known type of stonewalling that characterises this settlement pattern (CCP) in the region (KZN) is known as Moor Park, which dates from the 14th to 16th Centuries AD (Huffman, 2007). This type of stonewalling can be found in defensive positions on hilltops in the Midlands of KZN (Huffman, 2007) (***Figure 4***).

Archaeologists have concluded that the function of these structures was to serve mainly defensive purposes - the site of Moor Park is "*located on the spurs and ends of hills, stone walls cut the settlement off from remaining terrain, perimeter walls enclose about two thirds of the settlement, leaving the back free*" (Huffman, 2007).

However, it has to be noted that the CCP and other forms of Iron Age stonewalling features are not restricted and/or endemic to the Eastern Bantu language speaking

group and/or the Nguni to whom the Zulu people belong. Huffman's (2007) statement validates this, "*Iron Age stonewalling occurs over much of Southern Africa*". He goes on to say, "*as the most visible sign of agro-pastoral settlement, there are several classifications, mostly for specific areas, and few for larger regions*". It has also to be noted that these stonewall structures were not the most dominant and/or preferred form of building for the KwaZulu-Natal Ngunis, even though some are dated to have been built during the times of war between the Colonial powers and the Zulus (for example, during the Anglo-Zulu War).

In KwaZulu-Natal, the most dominant and preferred form of Iron Age structures are the 'beehive huts'- documented in many historical records dating as far back as the colonial times (***Figure 5***).

This presents a challenge to the archaeological study of the Iron Age in the province. Huffman (2007) argues that the archaeology of KwaZulu-Natal is not as prominent as in other parts of the country because most of the structures were built of thatch material that do not preserve well. The same is true for their ceramics. The type site of Moor Park therefore presents a unique view of the Iron Age in KwaZulu-Natal.

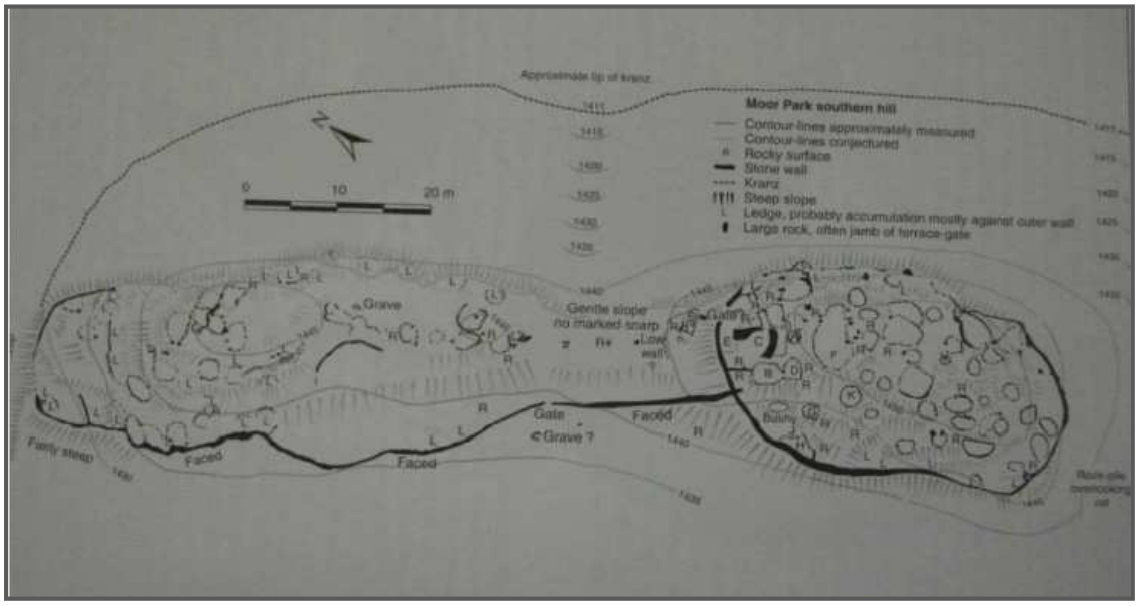

Figure 4- Site of Moor Park; picture ©T, N. Huffman (2007) to illustrate the CCP stonewalling (see also Davies 1974, from which the picture was initially taken).

The third phase of occupation in current day KZN was the **Late Iron Age** – a period just before the contact with the colonial settlers. In KwaZulu-Natal and other parts of southern Africa this period was characterised by a variety of expansionist battles fought by different chiefdoms, culminating in the pre-colonial southern African war called *Imfecane* (Ommer-Cooper, 1993). In the province of KwaZulu-Natal, thisstarted during the early 1800's when the amaZulu were still under the 'static kingdom' of Senzangakona (Omer-Cooper, 1993). In KZN, the *Imfecane* brought about many battles between and within the different local Zulu chiefdoms.

In other parts of the country the *Imfecane* also affected the Koni (Limpopo Province), the Tswana by the Ndebele ka-Mzilikazi (interior regions of the country) and the amaMpondo, amaHlubi, abaThembu and amaXhosa in the Eastern Cape regions (Wright, 1991).

The *Imfecane* featured very prominently in KwaZulu-Natal during the reign of King Shaka KaSenzangakhona (Ommer-Cooper, 1993). Some of these battles and raids spread as far north ascountries like Zimbabwe and Zambia.

In Zululand, one of the bigger local chiefdoms that Shakaconquered is the Ndwandwe chiefdom of Zwide kaLanga, which was situated north of Shaka's territory around the modern day kwaNongoma (Knight, 1998).

Shaka managed, to some degree, to achieve his ideal kingdom by strategically expanding/extending the traditional *amabutho* system. The *amabutho* were the brigades of young men of similar age gathered together for a period of national service (Wright, 1991). The *amabutho* were quartered at large royal homesteads, *amakhanda* (**Figure 6**) - which were sited strategically above the surrounding country to guard against both outside attack and internal dissension, like the site of Moor Park discussed above. During the times of need, *amabutho* would be organised into *impi* to fight and protect the Zulu kingdom. The *amabutho,* organised into *impi,* would also be sent out to attack and take over rival chiefdoms that were opposed to King Shaka's rule and in the process, incorporate them under his monarchy.

As powerful as it may have been, King Shaka's reign as the Zulu King did not last long, as he was assassinated by his younger brothers in September 1828. One of them, Dingane KaSenzangakhona then became King. It is argued that by the time of his assassination, Shaka had not yet fully managed to assume and reconcile into his kingdom all the local Zulu chiefdoms: "*much chiefdom (sic)within the kingdom were still unreconciled to Zulu rule, while Zulu influence south of Thukela [was still] patchy*" (Knight, 1998).

The area south of the Thukela River (Natal) was to some degree devoid of King Shaka's hold. He did not manage to assimilate all the chiefdoms south of uThukela under his rule and this had negative ramifications to the Zulu kingdom for the years to come. King Shaka moved the royal homestead to KwaDukuza, Stanger, south of the upper Thukela River before his assassination by Dingane (and Mpande), who later relocated and rebuilt it at uMgungundlovu, '*The Place Surrounding the Elephant*' in the emaKhosini valley where King Shaka and King Dingane's forefathers are buried. The moving of the royal homestead by both Shaka and Dingane presents an interesting 'thesis' into the internal dynamics and politics of the Royal House and possibly 'one of the reasons' for the assassination of King Shaka by his brothers. One important reason for the relocation of the royal homestead back to uMgungundlovu-north of the upper Thukela River, was the growing influence of the white community at Port Natal (settlers) and the encroaching Trek Boers who crossed the Ukhahlamba Mountains into Natal in 1837 (Knight, 1998).

The period of encroachment of first Natal, then Zululand, represents a **fourth phase** of settlement or occupation of KwaZulu-Natal, before it became open to most people during the periods of the Union of South Africa (1910-1961), Nationalist rule (1947-1994), and democratic South Africa (1994-to date)

Figure 5- Pre-industrial Zulu village: beehive huts, note homestead built using thatch material (Colonial period picture) (Laband & Thompson, 2000)

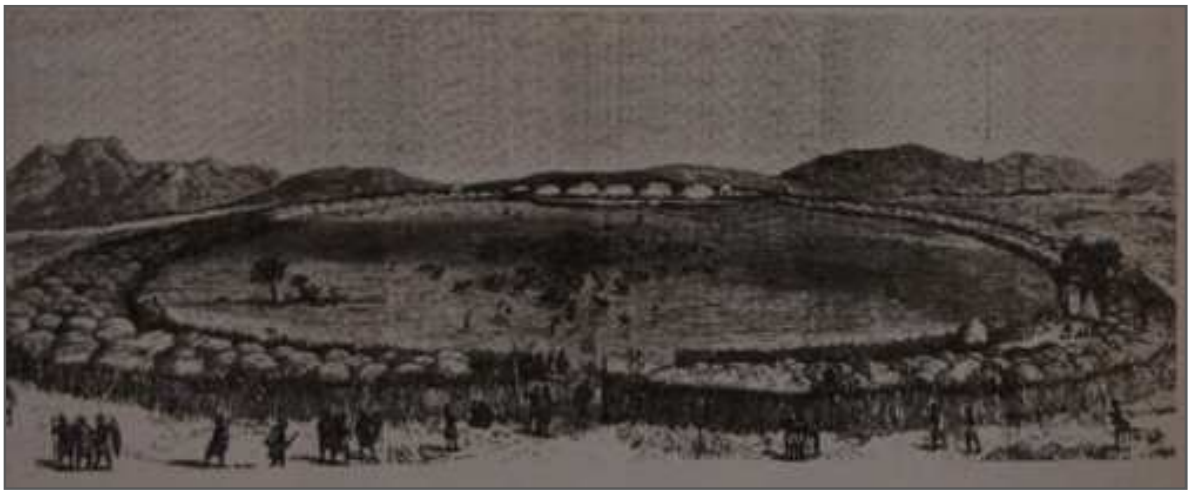

Figure 6 - An illustration of iKhanda or the royal homestead (Laband & Thompson, 2000)

Natal and Zululand: A Colonial Time Account of KwaZulu-Natal

The settler and Boer influence south of upper Thukela (uThukela) River and the strong Zulu influence north of the river during the late 1830s become important in understanding the development of the two territories divided by the river,

whichlater became known as Natal and Zululand. This also marks the fourth phase in the development of what is today known as KwaZulu-Natal.

Since the 1830s, the KwaZulu-Natal landscape was divided into the north and the south; Natal in the south and Zululand in the north. Zululand can be broadly defined as the land between the uThukela River (some 100km north of present day Durban) and the Pongola River and Swaziland to the north, with Natal as the area south of the u-Thukela River. Initially this border was blurred and unmarked by any geographic or physical feature until colonial times:

"*Certainly, this was the extent of the Zulu kingdom during its most static phase, although at times the Zulu kings exercised authority over the country considerable further south, while their hold over the northern borders was always tenuous. In fact, the kings defined their boundaries in terms of people who gave them allegiance, rather than by geographical features, and the idea of a single Zulu identity is largely mythical*" (Knight, 1998).

Knight (1998) goes on to argue that "the history of the Zululand and its southern neighbour Natal has always been inextricably mixed, and the physical boundaries between them blurred". The political border that existed between Zululand and Natal was in prehistoric times not marked by any geographic features. Natal came to exist when, the Portuguese explorer, Vasco da Gama, noted theexistence of the south-eastern seaboard in his log as he sailed around the Cape and up the east coast of Africa, searching for a route to the Indies. He christened it *Terra Natalis*, in honour of the birth of Christ, and for the [following] centuries Natal was used to describe the country south of uThukela (idem: 15).

Existing archival evidence for the formal proclamation of uThukela River as the political boundary dividing Zululand (in the north) and Natal (in the South) dates to the 1850's, during King Cetshwayo kaMpande's rule as the Zulu King (***Figure 7***).

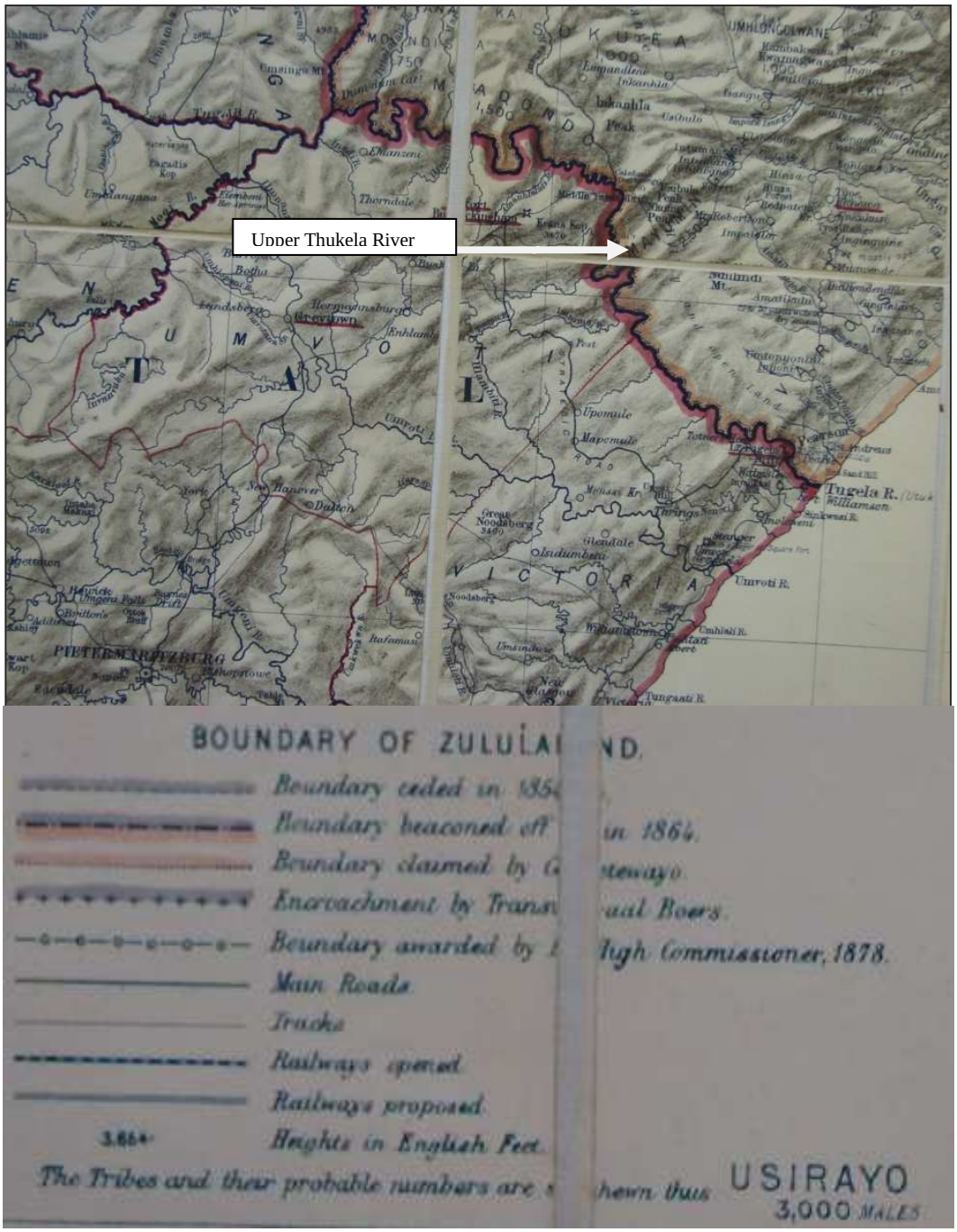

Figure 7- Map showing the Natal (south of Thukela River) and Zululand (north of Thukela River) Boundary, as well as the boundary proclaimed by King Cetshwayo in the 1870s when he became King. The first official proclamation of the boundary dividing Natal and Zululand took place in 1854 (note the map legends).

Stanford's Large Scale Map of Zulu Land with adjoining parts of Natal, Transvaal and Portuguese Africa, March 4th 1879 © Map Archives, Cullen Library, University of the Witwatersrand, Johannesburg, South Africa.

Zulu Civil War and the Split in the Royal House

Following the December 16, 1838 victory against Dingane, the Boers attempted to capture Dingane on numerous occasions, but their attempts were in vain on most of these occasions, in some cases with Dingane abandoning his royal homesteads and in some, with both sides failing to secure a clear and clean victory against one another until a ***Peace Accord*** was struck between the Zulu and the Boers, facilitated by the British in 1839 (Knight, 1998).

Some Zulu chiefs seem to no longer have had respect and trust for Dingane and his authority was questioned. This was followed by a split in the Royal House, with Prince Mpande KaSenzangakhona defecting to the south of uThukela River where his older brother, Shaka, had established the royal homesteadpreviously. By now the battle for the soul of Zululand was within the Royal House until Mpande defeated Dingane in a civil war of 1840 in the Maqongqo Hills, assisted by Nongalaza kaNondela (a famous and brave Zulu warrior and chief) who had assisted Dingane on his Thukela River against the settlers and the Boers (Knight, 1998).

Following his defeat Dingane, fled to the northern borders on Zululand, in the Lebombo Mountains on the Swaziland border, where he tried to rebuild his kingdom with loyal followers who clung to him and where he later died. In the southern regions, the stronghold of the Zulu kingdom, Dingane was succeeded by his younger brother Mpande in February 1840.

Mpande had by now built relations with the Boers following his defeat of his older brother Dingane the yearbefore. However, his assistance from the side of the Boers came at heavy price to him:

> *"In fact, the practical role played by the Trekkers in Dingane's final defeat had been limited, but the price they demanded for it was high, and Mpande knew he dared [not] provoke them. The Trekkers appropriated thousands of head of cattle, and grandly extended their claim to Zulu territory up to the Mfolozi River, annexing nearly half of the kingdom – far more land, in fact, than there were farmers to occupy it. In the event, the Boers also had little time to enjoy*

this victory. In 1842, disturbed by the unsettling effects the Trekker policies were having in the region as a whole, British troops returned to Port Natal. Pretorius refused to accept their authority and fighting broke out on the fringe of the great lagoon. More troops were rushed up from the Cape, and the Trekkers resistance collapsed. Natal became a British Colony, and many Boers, disgusted by the prospects of living under British rule once more, trekked back across the mountains into the interior regions of the country". (Knight, 1998).

After two decades of struggle, Natal had passed from nominal control of the Zulu kings to that of the Boers, and finally to the British. According to Knight (1998), this could, in logic, only mean one thing for the future, to bring all the three groups into further conflict. In the meantime, King Mpande agreed to fix the southern boundaries of the kingdom for the first time, in an accord signed by him and the British administration in Natal (***Figure 7***). This Anglo-Zulu accord specified the Natal-Zulu border as the line of the Mziyathi and Thukela rivers- an agreement which allowed Mpande quietly to recover all the territory the Boers had extracted from him.

His reign as the Zulu King continued for another 30 years until his death in 1872, leaving the kingdom to Cetshwayo KaMpande.

Figure 8- Map indicating the movement of tribes between 1818 and 1835.

Gumbi Tribe

The prominent Zulu clan in the study area is the Gumbi clan that received an estimated 20 000 hectares after a successful land claim process in 2005. The community decided to designate 16 000 hectares as a game reserve and 4 000 hectares for subsistence farming and residence.

The massive upheaval of the Mfecane and the subsequent movement of tribes are clearly indicated in **Figure 8**. Notable are the yellow and light green arrows to the east of Southern Africa indicated inside the red circle. The light green arrow indicates the Ndwandwe's movement under Zwide around 1818-1819, the brown arrow the movement of the Swazi under Sobhuza in 1815 and the yellow arrows the movement of the Ngoni under Zwangendaba around 1822.

From this background, Bryant (1929) postulates that Zwangendaba was a member of the Jele or *Gumbi* clan, an off-shoot of the *emaNcwangeni* clan, whom at the time lived around the Hluhluwe river west of the St Lucia lake.

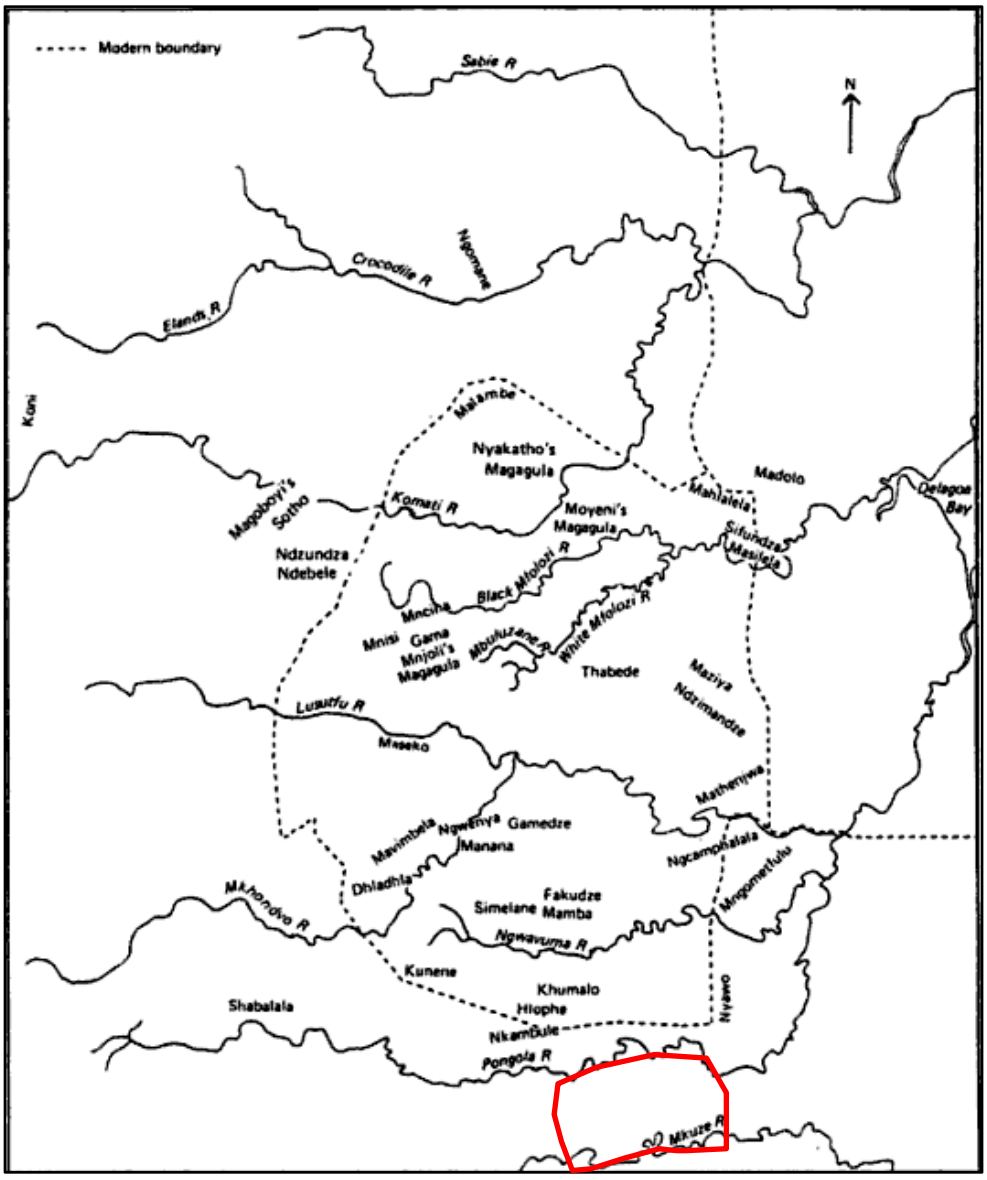

Figure 9- Map indicating the territory of the Swazi by 1820 (Bonner, 2002) *(Study area in Red)*

Swazi

In the late 1400's, a Nguni group under the leadership of Dlamini settled in the Delagoa Bay area. By the late 1700's, the Dlamini clan moved into land settling on the banks of the Pongola River where it cuts through the Lebombo Mountains. An attempt was also made to occupy the area between the Pongola River and Magudu Hills (at that stage the area was under Ndwandwe rule), but they had to retreat back across the Pongola River (**Figure 9**) (Bonner, 2002).

Serious rivalry between the Ndwandwe under Zwide and the Ngwane (Swazi) under Sobhuza created a period of unrest and confrontation in the early 1800's. A final push from Zwide to annex the grain fields on the south side of the Pongola River, almost destroyed the Ngwane. These successive Ndwandwe attacks lead to the fleeing of the Ngwane to the far north (Bonner, 2002).

Pongola Town History

Pongola was established during the 1930's, as part of a government irrigation scheme up-stream of the current Pongolapoort Dam. This settlement comprised 159 plots with a total area of 6 189 ha. In 1954 a Sugar Mill was constructed and irrigation to the area was carried outvia pumping and irrigation canals (Vuuren, 2009)

General History of Conservation in the area

The following list provides a short history of highlights in the conservation activities of the Pongola area.

2 Aug 1889	The Pongola Reserve was proclaimed as the first wildlife Reserve in Africa
1893	Buffalo, Eland and Giraffe were added to the list
1894	H.F. van Oord was appointed as the first Game Ranger of Pongola and thus the first in Africa
1902	Lord Milner re-proclaimed the Pongola and Sabie Reserves, although the South African War had decimated the game in Pongola in particular. Col. James Stevenson Hamilton was appointed and later transferred to the Sabie Reserve. Pongola was howeverde-proclaimed in 1921.

(Camp, 2012)

3.1.1 Findings of the Heritage Scoping Document

The findings can be compiled as follows and arecombined to produce a heritage sensitivity map for the project:

Archaeology

Research into the archaeological evidence in the study area has shown significant archaeological sites outside the study area, such as Border Cave. No further direct reference to archaeological sites within the study area could be found, however the following inferences with regards to Later Iron Age Settlements associated with the Swazi and Ndwandwe in the late 1700' to early 1800's can be made:

Magudu Hills – Situated in the western most section of the study area (S27 32 03.8 E31 38 59.2), this hilly area is known as one of the settlement areas of the Ngwane in the early 1800's and the scene of conflict with the Ndwandwe. (**Figure 10**)

Agricultural areas / Grain field areas – The area to the north of the study area between the Pongola river in the north and the Koedoesberg and Rooirante in the south was utilised as an agricultural area during the 1800's and was the source of the final conflicts between the Ndwandwe and Ngwane. (**Figure 10**)

Historical

Evaluation of the 1:50 000 Topographical maps produced in the 1980's, as well as recent aerial photographs and Google Earth has focused on the following delineations:

1. Single structures – Point source
2. Farmsteads - Polygon
3. Tribal areas / high density rural settlements - Polygon
4. Significant places – Point Source
5. Mountainous areas and mountains with names indicated on the maps – Point Source

Further to this, the point sources were buffered:

1. Single point sources and clusters at 100 meters
2. Significant places and named mountains points at 500 meters

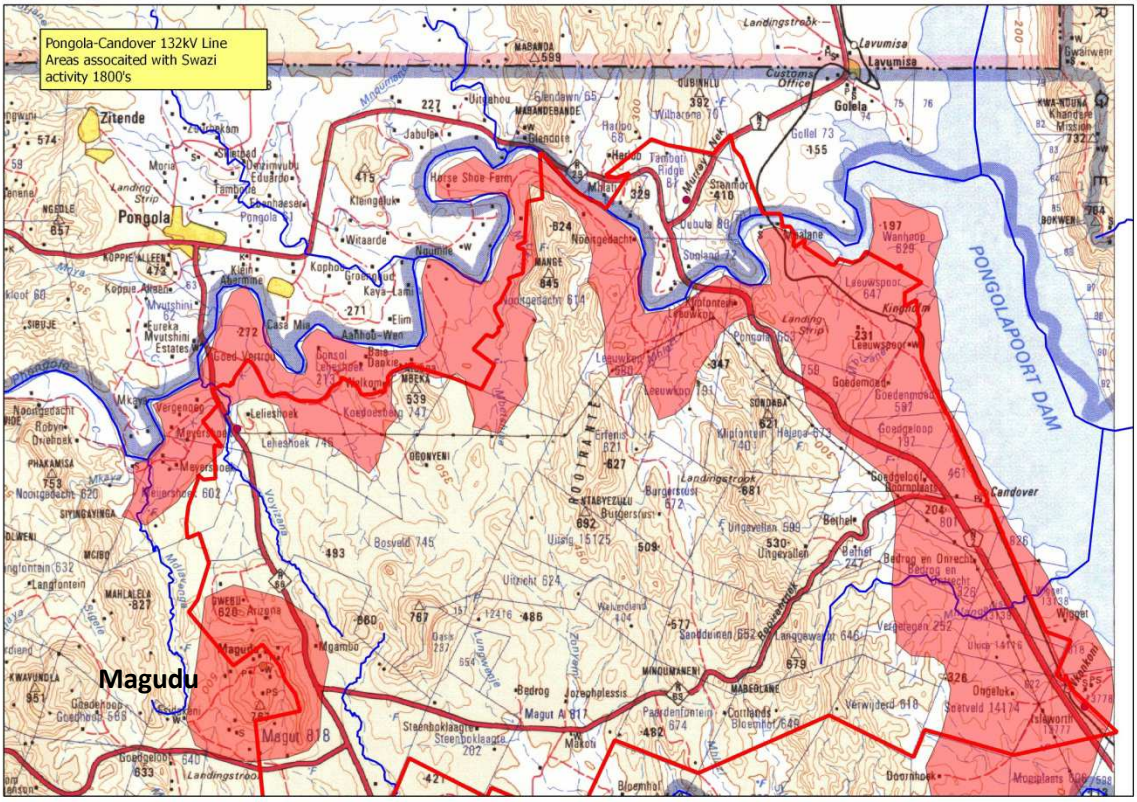

Figure 10 – Archaeologically sensitive areas identified from the literature (Refer to Appendix A)

The aim of the analysis was to identify areas that could have possible heritage significance. From a regional analysis perspective this delineation covers the following possible heritage finds (**Figure 11**):

1. Archaeological sites (Specifically Iron Age)
2. Traditional Cultural Places (TCP's)
3. Cemeteries and grave sites usually associated with tribal areas and homestead settlements

   NB: This analysis and identification of possible heritage sensitive areas does not show these areas as no-go areas but only as possibly sensitive towards heritage. They therefore need to be treated as such until the final alignments have been identified and ground truthing could prove the contrary with regards to sensitivity.

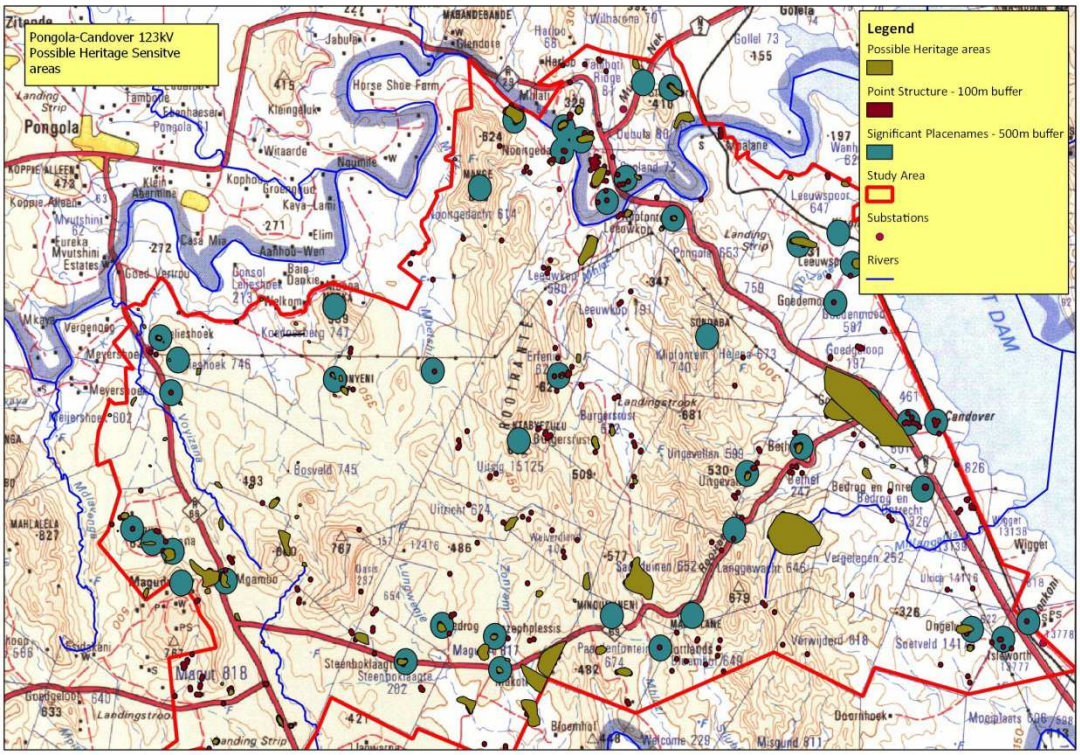

Figure 11 – Heritage Sensitivity Map (Refer to Appendix A)

Palaeontology

The study area is mainly underlain by Sedimentary rocks of the Karoo Supergroup and Jurassic Dolerite and Volcanics (**Figure 12**). The three alternative routes cut similar geological formations and the discussion of the potential for palaeontological finds will be combined in a single discussion. The proposed Golela Substation is situated on Permian Emakwezeni Formation (Pem).

The western sections of the three alternative routes for the power lines cuts the Permian Ecca Group sediments of the Karoo Supergroup, the central sections cuts rocks of the Permian Emakwezeni and Triassic Ntabene, Nyoka and Clarens Formations, with the eastern sections of the lines cutting Jurassic volcanic rocks of the Lebombo Group.

The desktop survey indicates that the proposed development is underlain by deposits of Karoo Supergroup rocks, mainly sedimentary and volcanic rocks. It is likely that the sedimentary sequences underlying this part of the study area will contain significant fossils. Eastern sections of the proposed lines on routes 1 to 3 cut the Permian Ecca Group sediments, with special mention of the fossil rich Vryheid Formation. Shorter sections cut

through Permian Emakwezeni Formation of the Beaufort group and limited sections of the Ntabene, Nyoka and Clarens Formations of the Karoo Supergroup.

Although not much information is available from these formations in the study area, correlation with equivalent formations in the main Karoo Basin requires at least a Phase 1 Palaeontological Assessment of outcrops of these formations.

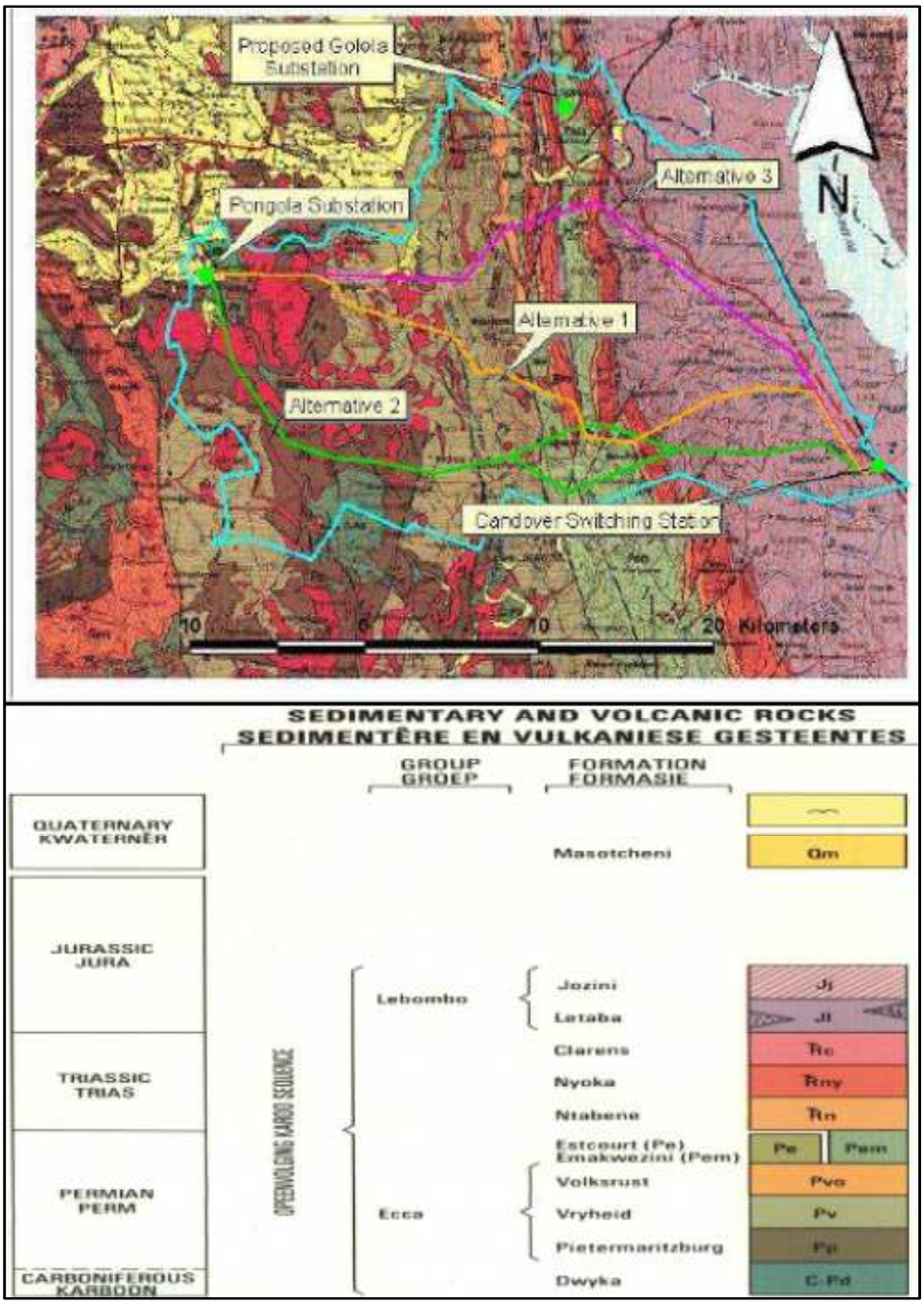

Figure 12 – Geology (Geo Map 2730- Vryheid) of the Pongola 132 kV power line Development

3.2 Field work findings

The initial site selection process from the various specialist studies and terrain evaluations provided three final route options for the proposed power line (**Figure 13**).

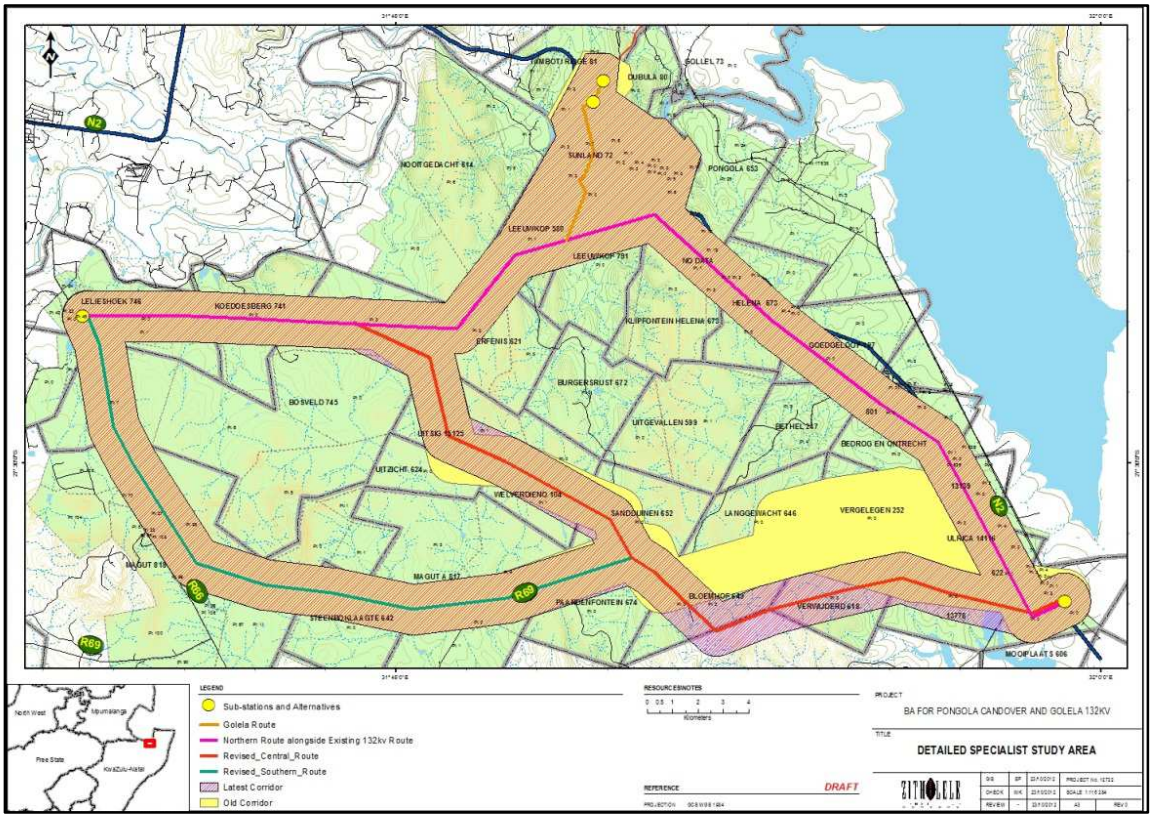

Figure 13 – Route alignments and corridors as part of final route selection

A survey of the Corridors provided for the study was conducted at the end of September 2012. Due to the extent of the corridors and alignments the field work focused on the proposed localities for the substations for Golela and Candover, as well as targeted areas where access was possible (**Figure 18**).

Local communities were questioned about graves and other sacred/heritage sites, and no such sites could be confirmed by the communities in the vicinity of the alignments. It was further indicated that burials mostly took place in existing municipal cemeteries and not in tribal or farm cemeteries (Informant was Josef Mkisi).

Figure 14 – Existing 132kV line

Figure 15 – Homesteads in study area

Figure 16 – General view of terrain

Figure 17 – Pongola Substation

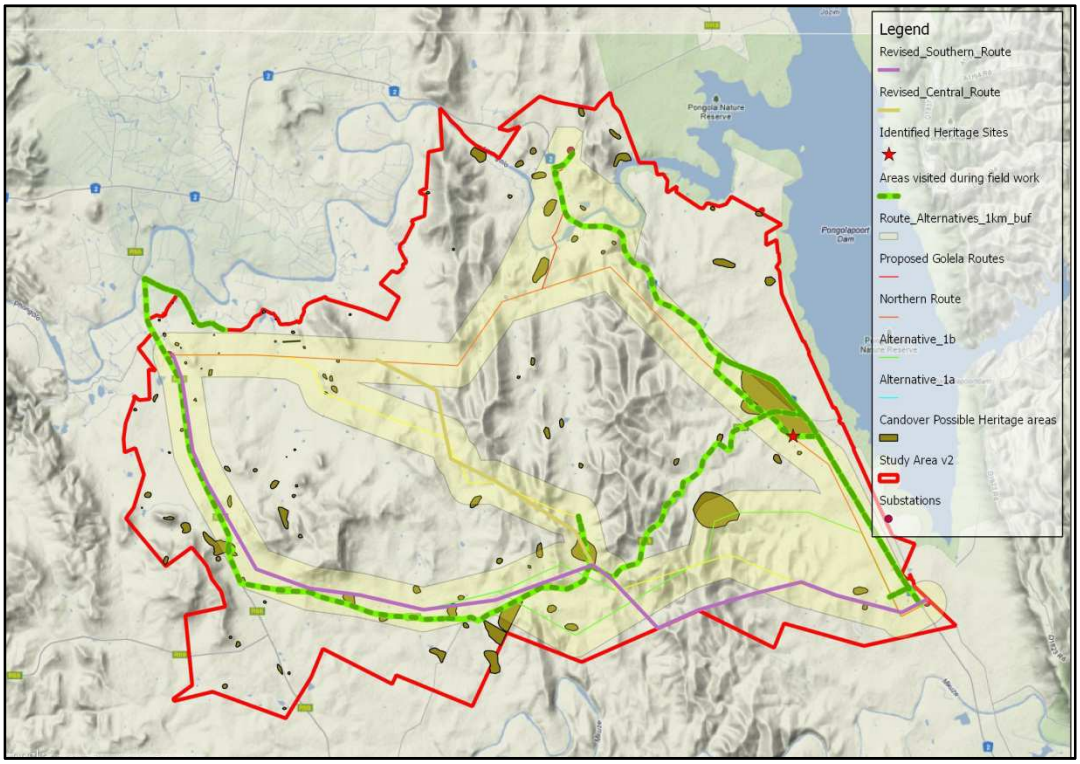

Figure 18 – Study area with tracklogs of alignments evaluated

During the field evaluation one heritage site was identified close to the eastern section of the Northern Route alignment.

PC001

GPS: 27,48133 S 31,92591 E

A low density scatter (± 2-5 artefacts in 10m x10m) of Middel Stone Age stone tools was identified in a clearing which had been exposed by erosion. The clearing was situated betweena game fence and a dirt track next to the fence. The artefacts consisted mainly of blades, scrapers and a few cores. The artefacts were of low quality and were made of poor quality materials

Figure 19 – General view of site PC001

Figure 20 – Stone tools identified on site PC001

The site is graded as General Protected A and is of low heritage significance.

3.3 Heritage Issues and Potential Impacts

4 ISSUE	Impact on archaeological sites
DISCUSSION	As seen from the archival work, field visit and discussion in Sections 3.1 and 3.2, the possibility of archaeological finds has been confirmed and thus a walk down of the final route will be required after the design and pylon placement has been done..
EXISTING IMPACT	The large scale farming activities in the eastern, western and northern sections of the study area would have impacted on heritage resources.
PREDICTED IMPACT	Unidentified archaeological sites and the discovery of such sites during construction can seriously hamper construction timelines. A walk down of the final designed alignment can thus provide valuable information on such sites in the study area and provide timeous management of such sites through realignment of development or mitigation of such sites where needed.
MITIGATION	Archaeological walk down of final alignment.
CUMULATIVE EFFECT	None foreseen at this stage.

ISSUE	Impact on historical sites
DISCUSSION	As seen from the archival work, field visit and discussion in Sections 3.1 and 3.2 the possibility of historical siteshas been confirmed and thus a walk down of the final route after the design and pylon placement has been done will be required.
EXISTING IMPACT	The large scale farming activities in the eastern, western and northern section of the study area would have impacted on any historical sites.
PREDICTED IMPACT	Unidentified historicalsites and the discovery of such sites during construction can seriously hamper construction timelines. A walkdown of the final designed alignment can thus provide valuable information on such sites in the study area and provide timeous management of such sites through realignment of development or mitigation of such sites where needed.
MITIGATION	Archaeological walk down of final alignment.

ISSUE	Impact on graves and cemetery sites
DISCUSSION	Although field work has indicated that in most of the tribal areas no burials outside formal cemeteries occur currently, this would not have been the case in earlier times.
EXISTING IMPACT	Impact due to earlier developments cannot be excluded.
PREDICTED IMPACT	Unidentified graves and cemeteries and the discovery of such sites during construction can seriously hamper construction timelines. In the event that these graves and cemeteries can not be avoided a grave relocation proceess needs to be started. Such a process impacts on the spiritual and social fabric of the next of kin and associated communities. A walk down of the final designed alignment can thus provide valuable information on such sites in the study area and provide timeous management of such sites through realignment of development or mitigation of such sites where needed.

INVESTIGATION REQUIRED	Archaeological walk down of final alignment.
CUMULATIVE EFFECT	None foreseen at this stage.

ISSUE	Impact on palaeontological sites
DISCUSSION	The desktop survey indicates that the proposed development is underlain by deposits of Karoo Supergroup rocks, mainly sedimentary and volcanic rocks. It is likely that the sedimentary sequences underlying this part of the study area will contain significant fossils. Eastern sections of the proposed lines on routes 1 to 3 cut the Permian Ecca Group sediments, with special mention of the fossil rich Vryheid Formation. Shorter sections cut through Permian Emakwezeni Formation of the Beaufort group and limited sections of the Ntabene, Nyoka and Clarens Formations of the Karoo Supergroup. The Golela Substation is situated on the Emakwezeni Formation and might contain examples of Permian fossils. The Jurassic Dolerite Sills as well as the Jurassic Lebombo Group volcanic deposits will have no fossil material due to its igneous character. **Figure 21** indicates the sensitivity of the three alternatives on the different geological formations. Red lines indicate high probability for fossils to be found, while the green lines indicate areas where no fossils are expected. The igneous character of the Dolerite Sills scattered throughout the area and Lebombo Group on the eastern sections has no significance for palaeontological finds and no management measures for the preservation of these rocks or rescue of palaeontological data are needed. If fossil material is discovered during the construction phase, it must be appropriately protected and the discovery reported to a

	palaeontologist for the removal thereof as per SAHRA legislation.
EXISTING IMPACT	Impact due to earlier developments cannot be excluded.
PREDICTED IMPACT	Unidentified palaeontological sites and the discovery of such sites during construction can seriously hamper construction timelines. Field work can thus provide valuable information on such sites in the study area and provide timeous management of such sites through realignment of development or mitigation of such sites where needed.
INVESTIGATION REQUIRED	A Phase 1 Palaeontological Assessment will be required on the final alignment after the design and pylon positions have been determined.
CUMULATIVE EFFECT	None foreseen at this stage.

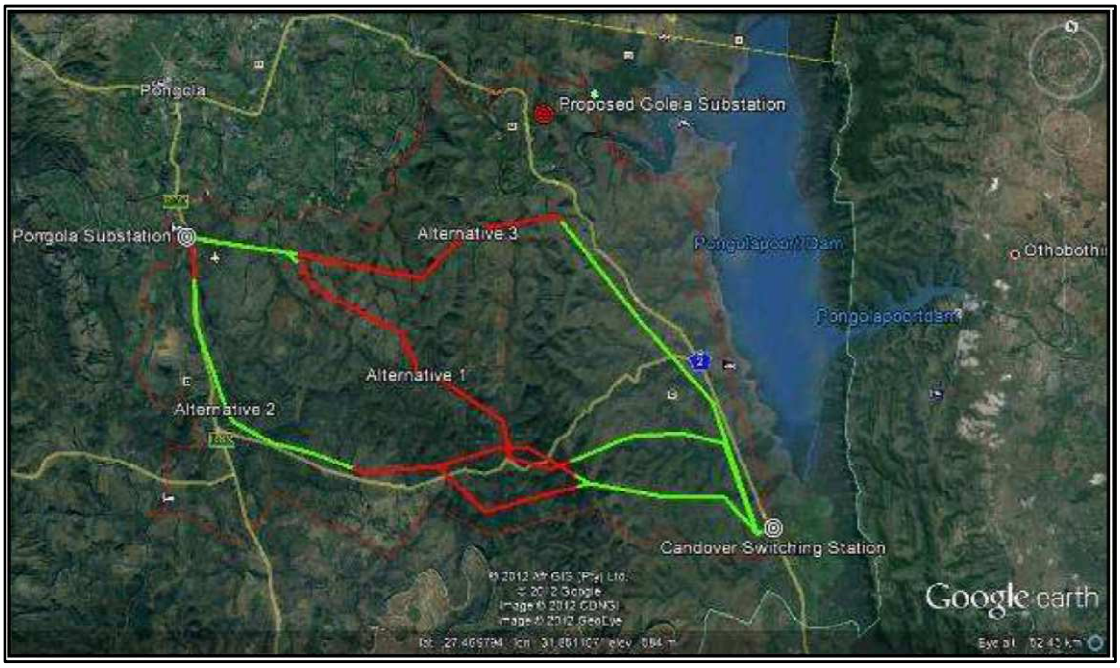

Figure 21 – Palaeontological sensitivity map of proposed Pongola 132kV power line and substation development

4.1 Route Alternative Impact Rating Scales

The following tables evaluated the possible impacts on heritage resources on each of the three route alternatives.

4.1.1 Impact evaluation before mitigation

Western route

Impact	Magnitude	Scale	Duration	Probability	Significance
Impact on archaeological resources	4	1	5	2	20
Impact on historical resources	4	1	5	2	20
Impact on cemeteries and graves	4	1	5	2	20
Impact on palaeontological resources	6	3	5	3	42
				Average	25.5

Central route

Impact	Magnitude	Scale	Duration	Probability	Significance
Impact on archaeological resources	4	1	5	2	20
Impact on historical resources	4	1	5	2	20
Impact on cemeteries and graves	4	1	5	2	20
Impact on palaeontological resources	6	3	5	4	56
				Average	29

Northern route

Impact	Magnitude	Scale	Duration	Probability	Significance
Impact on archaeological resources	4	1	5	2	20
Impact on historical resources	4	1	5	2	20
Impact on cemeteries and graves	4	1	5	2	20
Impact on palaeontological resources	6	3	5	3	42
				Average	25.5

The Central Route alignment has a higher average significance point rating due to the palaeontological sensitive areas identified in the Palaeontological desktop assessment.

4.1.2 Impacts with mitigation measures implemented

Western route

Impact	Magnitude	Scale	Duration	Probability	Significance
Impact on archaeological resources	4	1	2	1	7
Impact on historical resources	4	1	2	1	7
Impact on cemeteries and graves	4	1	2	1	7
Impact on palaeontological resources	4	1	5	2	20
				Average	10.25

Central route

Impact	Magnitude	Scale	Duration	Probability	Significance
Impact on archaeological resources	4	1	2	1	7
Impact on historical resources	4	1	2	1	7
Impact on cemeteries and graves	4	1	2	1	7
Impact on palaeontological resources	4	1	5	4	40
				Average	15.25

Northern route

Impact	Magnitude	Scale	Duration	Probability	Significance
Impact on archaeological resources	4	1	2	1	7
Impact on historical resources	4	1	2	1	7
Impact on cemeteries and graves	4	1	2	1	7
Impact on palaeontological resources	4	1	5	2	20
				Average	10.25

The Central Route alignment has a higher average significance point rating due to the palaeontological sensitive areas identified in the Palaeontological desktop assessment.

5 CONCLUSIONS AND RECOMMENDATIONS

The Heritage Background Report and field assessment have shown that the study area and surrounding area have a rich historical and archaeological history.

Local communities were questioned about graves and other sacred/heritage sites, and no such sites could be confirmed by the communities in the vicinity of the alignments. It was further indicated that burials mostly took place in existing municipal cemeteries and not in tribal or farm cemeteries.

As the purpose of the site evaluation was to identify the most feasible alignment from a heritage perspective, from the impact significance ratings the most feasible alignments are the western and northern route alignments.

The next step is the compilation of a site specific heritage management plan will be an archaeological walk down and a Phase 1 palaeontological assessment of the final designed alignment to identify all heritage resources to be impacted by the final route alignment and pylon placments. The studies will provide timeous management of such site through realignment of the development or mitigation of such sites where needed.

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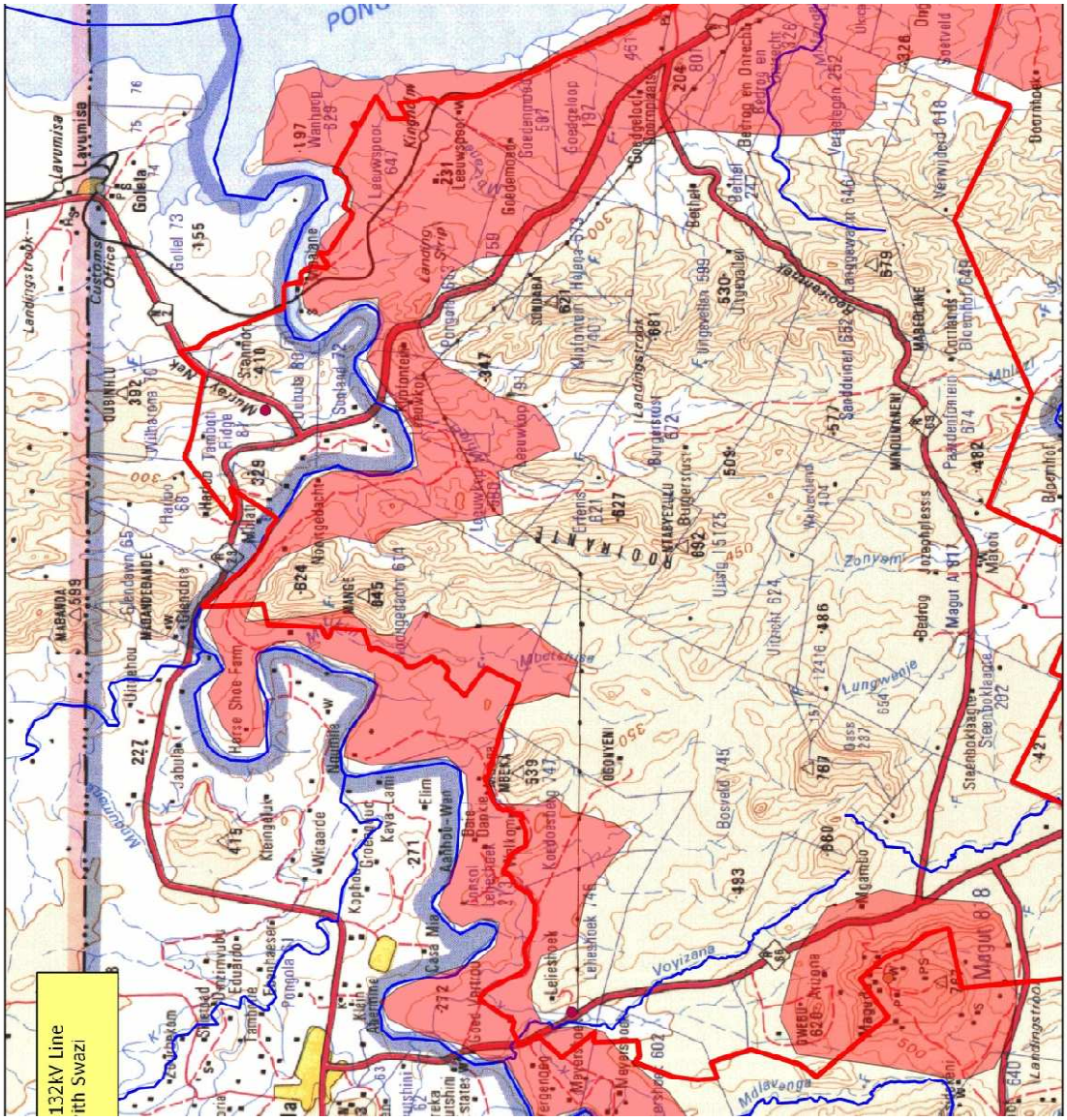
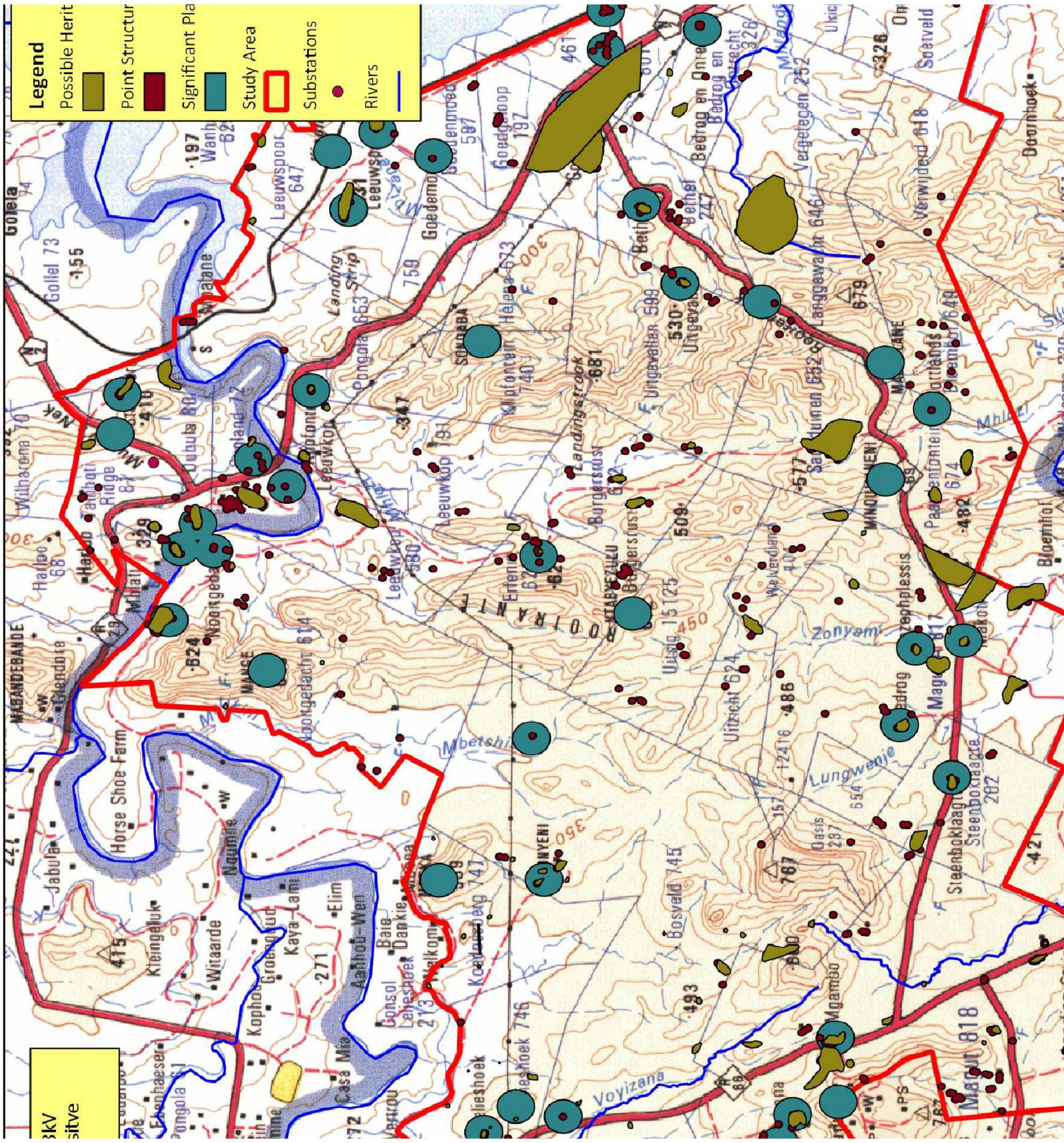
Appendix A

HERITAGE SENSITIVITY MAPS





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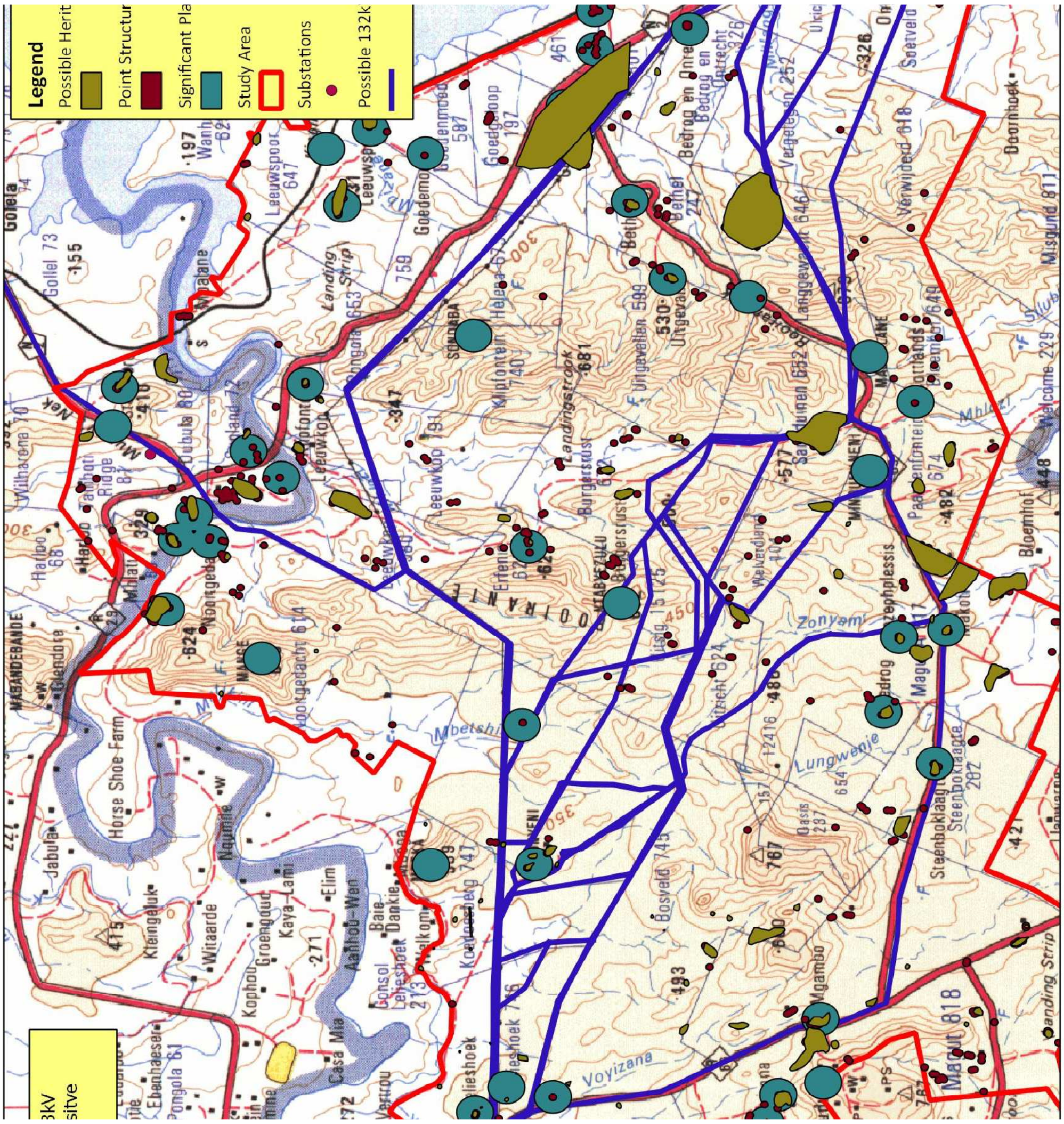
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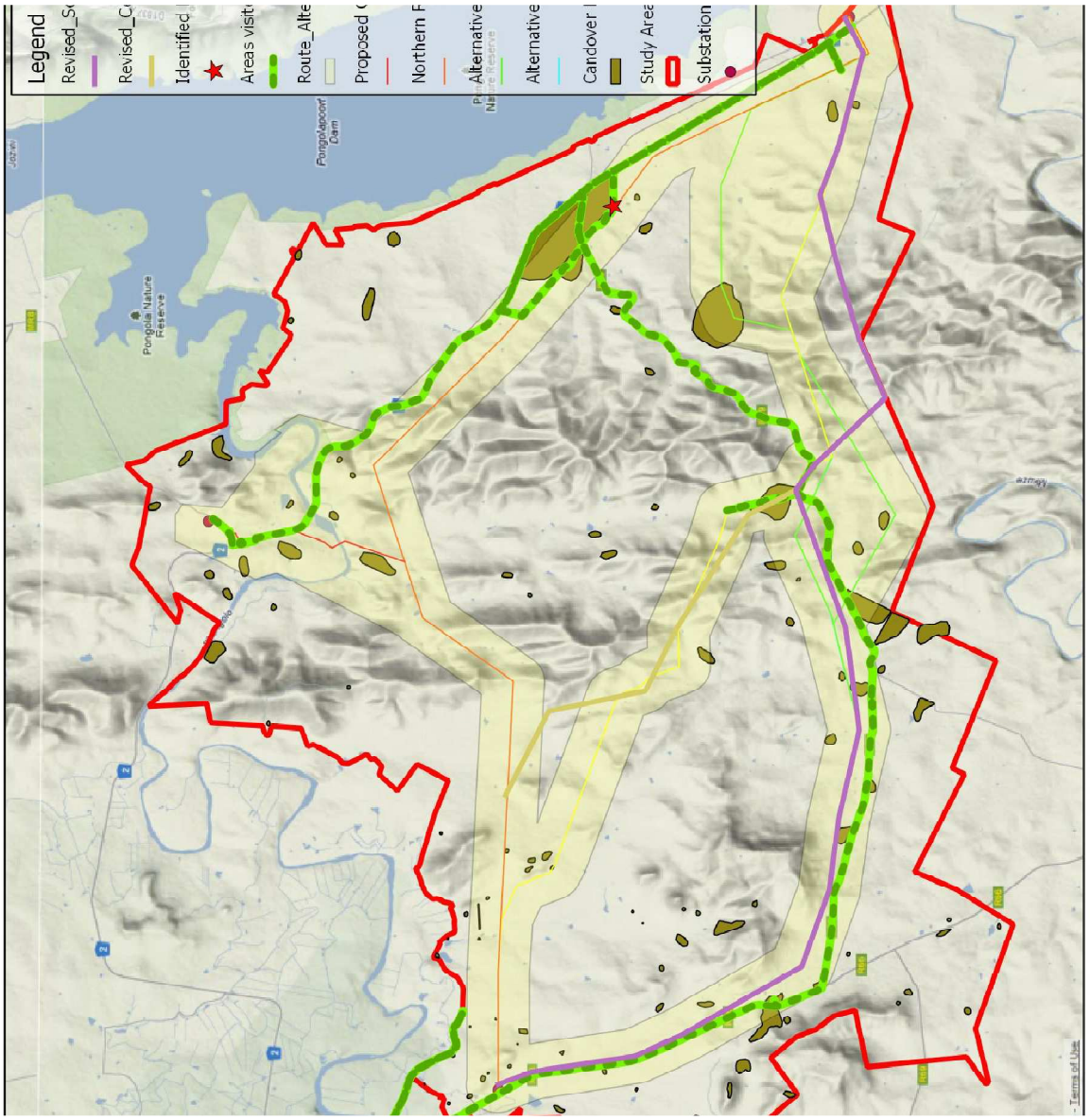
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Pongolapoort Dam

Appendix B

LEGISLATIVE REQUIREMENTS – TERMINOLOGY AND ASSESSMENT CRITERIA

3.1 General principles

In areas where there has not yet been a systematic survey to identify conservation worthy places, a permit is required to alter or demolish any structure older than 60 years. This will apply until a survey has been done and identified heritage resources are formally protected.

Archaeological and palaeontological sites, materials, and meteorites are the source of our understanding of the evolution of the earth, life on earth and the history of people. In the new legislation, permits are required to damage, destroy, alter, or disturb them. People who already possess material are required to register it. The management of heritage resources is integrated with environmental resources and this means that before development takes place heritage resources are assessed and, if necessary, rescued.

In addition to the formal protection of culturally significant graves, all graves, which are older than 60 years and are not in a cemetery (such as ancestral graves in rural areas), are protected. The legislation protects the interests of communities that have interest in the graves: they may be consulted before any disturbance takes place. The graves of victims of conflict and those associated with the liberation struggle will be identified, cared for, protected and memorials erected in their honour.

Anyone who intends to undertake a development must notify the heritage resource authority and if there is reason to believe that heritage resources will be affected, an impact assessment report must be compiled at the construction company's cost. Thus, the construction company will be able to proceed without uncertainty about whether work will have to be stopped if an archaeological or heritage resource is discovered.

According to the National Heritage Act (Act 25 of 1999 section 32) it is stated that:

An object or collection of objects, or a type of object or a list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including –

- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens;
- visual art objects;
- military objects;
- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video 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), or in a provincial law pertaining to records or archives; and
- any other prescribed category.

Under the National Heritage Resources Act (Act No. 25 of 1999), provisions are made that deal with, and offer protection, to all historic and pre-historic cultural remains, including graves and human remains.

3.2 Graves and cemeteries

Graves younger than 60 years fall under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925) as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the Office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning, or in some cases the MEC for Housing and Welfare. Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and

regional provisions, laws and by-laws must also be adhered to. In order to handle and transport human remains the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act) as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the South African Heritage Resource Agency (SAHRA). The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in the category located inside a formal cemetery administrated by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA authorisation.

If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.

Appendix C

HERITAGE ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies utilised in the study.

The Heritage Impact Assessment (HIA) report to be compiled by PGS Heritage and Grave Relocation Consultants (PGS) for the proposed Candover Pongola Project will assess the heritage resources found on site. This report will contain the applicable maps, tables and figures as stipulated in the NHRA (no 25 of 1999), the National Environmental Management Act (NEMA) (no 107 of 1998) and the Minerals and Petroleum Resources Development Act (MPRDA) (28 of 2002). The HIA process consists of three steps:

- Step I – Literature Review: The background information to the field survey usually leans greatly on the Heritage Scoping Report completed by PGS for this site.

- Step II – Physical Survey: A physical survey will be conducted on foot through the proposed project area by qualified archaeologists', aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.

- Step III – The final step involves the recording and documentation of relevant archaeological resources, the assessment of resources in terms of the heritage impact assessment criteria and report writing, including mapping and constructive recommendations.

The significance of heritage sites identified is based on four main criteria:

- **site integrity** (i.e. primary vs. secondary context),
- **amount of deposit, range of features** (e.g., stonewalling, stone tools and enclosures),
    - Density of scatter (dispersed scatter)
        - Low - <10/50m^2
        - Medium - 10-50/50m^2
        - High - >50/50m^2
- **uniqueness** and
- **potential** to answer present research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:

A - No further action necessary;
B - Mapping of the site and controlled sampling required;
C - No-go or relocate pylon position
D - Preserve site, or extensive data collection and mapping of the site; and
E - Preserve site

- Site Significance

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region, were used for the purpose of this report.

Table 1: Site significance classification standards as prescribed by SAHRA

FIELD RATING	**GRADE**	**SIGNIFICANCE**	**RECOMMENDED MITIGATION**
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	-	High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium Significance	Recording before destruction
Generally Protected C (GP.A)	-	Low Significance	Destruction

Appendix D

THE SIGNIFICANCE RATING SCALES FOR THE EIA

To ensure uniformity, the assessment of impacts is addressed in a standard manner so that a wide range of impacts can be compared with each other. For this reason a clearly defined significance rating scale is provided to assess the significance (importance) of the associated impacts. The scale embraces the notion of extent and magnitude, but does not always clearly define these since their importance in the rating scale is very relative. For example, the magnitude (i.e. the size) of are affected by atmospheric pollution may be extremely large (1000 km²) but the significance of this effect is dependent on the concentration or level of pollution. If the concentration were great, the significance of the impact would be HIGH or VERY HIGH, but if it were dilute it would be LOW or VERY LOW. Similarly, if 60 ha of a grassland type are destroyed the impact would be VERY HIGH if only 100 ha of that grassland type was known. The impact would be VERY LOW if the grassland type were common.

The potential significance of every environmental impact identified is determined by using a ranking scale, based on the following (the terminology is extracted from the DEAT guideline document on EIA Regulations, April 1998):

Occurrence

- Probability of occurrence (how likely is it that the impact may occur?), and
- Duration of occurrence (how long may it last?)

Severity

- Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and
- Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

In order to assess each of these factors for each impact, the following ranking scales were used:

Probability:
5 – Definite/don't know
4 – Highly probable
3 – Medium probability
2 – Low probability
1 – Improbable
0 – None

Duration:
5 – Permanent
4 - Long-term (ceases with the operational life)
3 - Medium-term (5-15 years)
2 - Short-term (0-5 years)
1 – Immediate

Scale:
5 – International
4 – National
3 – Regional (>5km)
2 – Local (<5km)
1 – Site only
0 – None

Magnitude:
10 - Very high/don't know
8 – High
6 – Moderate
4 – Low
2 – Minor

Once the above factors had been ranked for each impact, the environmental significance of each was assessed using the following formula:

SP = (magnitude + duration + scale) x probability

The maximum value is 100 significance points (SP). Environmental effects were rated as either of high, moderate or low significance on the following basis:

- More than 60 significance points indicated high environmental significance.
- Between 30 and 60 significance points indicated moderate environmental significance.
- Less than 30 significance points indicated low environmental significance.

High = H	Moderate = M	Low = L

Please note that **only negative impact will be ranked**

The degree of certainty of the assessment was judged on the following criteria:

Definite:	More than 90% sure of a particular fact.
Probable:	Between 70 and 90% sure of a particular fact, or of the likelihood of that impact occurring.
Possible:	Between 40 and 70% sure of a particular fact or of the likelihood of an impact occurring.
Unsure:	Less than 40% sure of a particular fact or the likelihood of an impact occurring.