

## **HERITAGE IMPACT ASSESSMENT, EIA REPORT**

Proposed establishment of the Alldays (up to 100 MW)  
Photovoltaic Solar Generation Plant on the Farm Gotha  
near Alldays in the Limpopo Province.

Prepared By:



**Credit Sheet**

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**Disclaimer;** Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. G&A Heritage and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.

**Statement of Independence**

As the duly appointed representative of G&A Heritage, I Stephan Gaigher, hereby confirm my independence as a specialist and declare that neither I nor G&A Heritage have any interests, be it business or otherwise, in any proposed activity, application or appeal in respect of which the Environmental Consultant was appointed as Environmental Assessment Practitioner, other than fair remuneration for work performed on this project.

Signed off by S. Gaigher

A handwritten signature in black ink, appearing to read 'S. Gaigher', with a stylized flourish at the end.

**Site name and location:** Proposed establishment of the Alldays (up to 75 MW) - Photovoltaic Solar Generation Plant on the farm Gotha near Alldays, Limpopo Province.

**Municipal Area:** Capricorn District Municipality.

**Developer:** BioTherm Energy

**Consultant:** G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa. 38A Voster Str. Louis Trichardt, 0920

**Date of Report:** 29 July 2013

# Management Summary

The purpose of the management summary is to distil the information contained in the report into a format that can be used to give specific results quickly and facilitate management decisions. It is not the purpose of the management summary to repeat in shortened format all the information contained in the report, but rather to give a statement of results for decision making purposes.

This study focuses on the construction of a new - Photovoltaic (up to 75 MW) Power Generation Solar Plant on the Farm Gotha near Alldays, Limpopo Province. The site will impact on an area of 175 ha of the farm and is therefore subjected to an Environmental Impact Assessment (EIA).

The purpose of the HIA phase of the study is to determine the possible occurrence of sites with cultural heritage significance within the study area and the evaluation of the heritage significance of these sites as well as the possible impacts on such sites by the proposed development.

## Findings

The area under investigation falls on the outside perimeter of the Mapungubwe World Heritage Site and Cultural Landscape. The areas investigated showed no indications of occupational sites and the area is also not geographically conducive to site. Although only 175 ha is proposed for the development, a significant buffer zone around this area was investigated to ensure that movements in the actual placement of the site would not affect any area of heritage significance.

## Recommendations

It is recommended that a heritage specialist is contracted to monitor the construction phase of this project to ensure that no sites of heritage significance is damaged. This is necessary due to the high heritage significance of the Mapungubwe Cultural Landscape. Although the area will have some short term impacts no long-term or compounded impacts are anticipated and it is envisaged that the proposed development will in the long run have more positive than negative impacts.

## Fatal Flaws

No fatal flaws were identified.

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## List of Abbreviations

Bp	Before Present
PV	Photovoltaic
EIA	Early Iron Age
ESA	Early Stone Age
GPS	Geographic Positioning System
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Late Stone Age
MYA	Million Years Ago
MSA	Middle Stone Age
NHRA	National Heritage Resources Act no 22 of 1999
SAHRA	South African Heritage Resource Agency
S&EIR	Scoping & Environmental Impact Reporting
Um	Micrometre ( $10^{-6}$ m)
WGS 84	World Geodetic System for 1984
WHS	World Heritage Site

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# EIA Heritage Impact Report for the Proposed 90/100 MW Musina Photovoltaic Array

## Introduction

### Legislation and methodology

G&A Heritage was appointed by Savannah Environmental cc to undertake a heritage impact assessment for the Musina 90/100 MW Photovoltaic Solar Generation Plant on the farm Venetia 103 in the Limpopo Province. Section 38(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study is undertaken for:

- (a) construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;*
- (b) construction of a bridge or similar structure exceeding 50 m in length; and*
- (c) any development, or other activity which will change the character of an area of land, or water –*
  - (1) exceeding 10 000 m<sup>2</sup> in extent;*
  - (2) involving three or more existing erven or subdivisions thereof; or*
  - (3) involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or*
  - (d) the costs of which will exceed a sum set in terms of regulations; or*
  - (e) any other category of development provided for in regulations.*

While the above describes the parameters of developments that fall under this Act., Section 38 (8) of the NHRA is applicable to this development. This section states that;

- (8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.*

In regards to a development such as this that falls under Section 38 (8) of the NHRA, the requirements of Section 38 (3) applies to the subsequent reporting, stating that;

- (3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2) (a): Provided that the following must be included:*
  - (a) The identification and mapping of all heritage resources in the area affected;*
  - (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7;*
  - (c) an assessment of the impact of the development on such heritage resources;*

- (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.*

- (a) places, buildings, structures and equipment;
- (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;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and paleontological sites;
- (g) graves and burial grounds, including –
  - (1) ancestral graves,
  - (2) royal graves and graves of traditional leaders,
  - (3) graves of victims of conflict (iv) graves of important individuals,
  - (4) historical graves and cemeteries older than 60 years, and
  - (5) other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
- (h) movable objects, including ;
  - (1) objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;
  - (2) ethnographic art and objects;
  - (3) military objects;
  - (4) objects of decorative art;
  - (5) objects of fine art;
  - (6) objects of scientific or technological interest;
  - (7) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
  - (8) any other prescribed categories, but excluding any object made by a living person;
- (i) battlefields;
- (j) traditional building techniques.

A **'place'** is defined as:

- (a) A site, area or region;
- (b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
- (c) a group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and
- (d) an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

**'Structures'** means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

**'Archaeological'** means:

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

- (b) rock art, being a 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 is older than 100 years including any area within 10 m of such representation; and
- (c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
- (d) features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

**'Paleontological'** means 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.

**'Grave'** means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

The removal of graves is subject to the following procedures as outlined by the SAHRA:

- Notification of the impending removals (using English, Afrikaans and local language media and notices at the grave site);
- Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the SAHRA;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

The limitations and assumptions associated with this scoping study are as follows;

- Field investigations were hampered in areas with heavy plant growth.
- Sites were evaluated by means of description of the cultural landscape and analysis of written sources and available databases as well as field investigations.
- It was assumed that the site location as provided by Savannah Environmental cc is accurate.
- We assumed that the public participation process performed as part of the Scoping and Environmental Impact Reporting (S&EIR) process will be sufficiently encompassing not to be repeated in this phase.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	No impact	None
	35	Archaeological, paleontological and meteor sites	Possible Impact	HIA
	36	Graves and burial sites	Possible Impact	HIA
	37	Protection of public monuments	No impact	None
	38	Does activity trigger a HIA?	Yes	HIA

Table 2. NHRA Triggers

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	Yes	Various distribution power lines and access roads
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m <sup>2</sup>	Yes	90/100 MW PV Solar Array
Development involving more than 3 erven or sub divisions	No	N/A
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	N/A
Re-zoning of site exceeding 10 000 m <sup>2</sup>	No	N/A
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

## Background Information

### Proposed Musina PV Array

#### Project Description

The Musina up to 75 MW Solar Array is proposed on a section of the farm Gotha 103 near Alldays in the Limpopo Province. The project will entail the construction of up to 75 MW Photovoltaic Solar Array on approximately -175 ha with associated infrastructure such as access roads and distribution lines. The electricity generated at this sites will be integrated into the national grid via the Venetia Sub-Station on the northern side of the Venetia/Musina Access Road.

#### Site Location

The proposed development site is located on a 175 ha portion of the farm Gotha 103, near Alldays in the Limpopo Province. This farm is located directly south of the DeBeers Venetia Diamond mine.

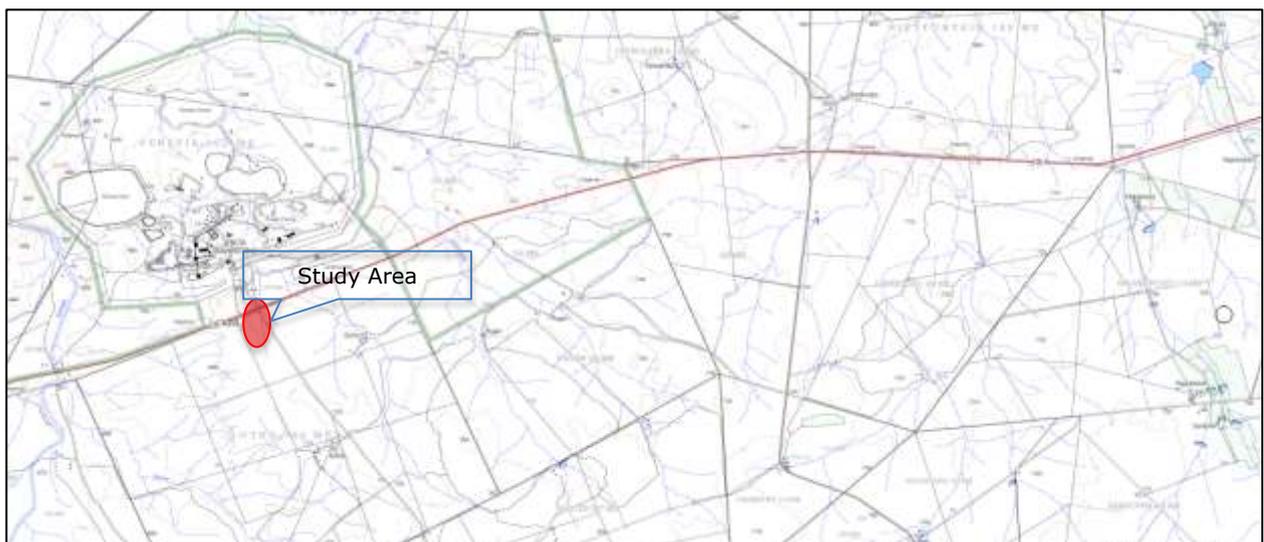


Figure 1. Location of study area



Figure 2. Landscape indicating calccrete deposits



Figure 3. Aerial View of Study Area

The red opaque area indicates the study area including the buffer zone.

## **Alternatives Considered.**

No alternatives were considered.

## **Methodology**

This study defines the heritage component of Environmental Impact Assessment process being undertaken for the Proposed Musina Photovoltaic Solar Array. It is described as a Heritage Impact Assessment. This report attempts to evaluate the accumulated heritage knowledge of the area as well as the heritage sensitivity of proposed development areas.

### **Evaluating Heritage Impacts**

The HIA relies on the analysis of written documents, maps, aerial photographs and other archival sources combined with the results of site investigations and interviews with effected people. Site investigations are not exhaustive and often focus on areas such as river confluence areas, elevated sites or occupational ruins.

The following documents were consulted in this study;

- South African National Archive Documents
- SAHRA Database of Heritage Studies
- Mapungubwe World Heritage Visitors Centre
- Internet Search
- Historic Maps
- 1936 and 1952 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2011 & 2003 imagery
- Published articles and books
- JSTOR Article Archive

### **Field Methodology**

The study area was accessed on foot due to heavy vegetation in areas. This was easily facilitated due to the close proximity of the mine access road. The survey attempted to keep to parallel transects, however the topography and vegetation made this difficult. Possible site indicators were also investigated which caused deviations. Fig. 5 shows the track paths logged on the GPS during the survey and exported as a GPX file that was in turn plotted on Google Earth. The GPX files are available on request from G&A Heritage's office.



Figure 4. Landscape type



Figure 5. GPS Track Paths

### **Assessing Visual Impact**

Visual impacts of developments result when sites that are culturally celebrated are visually affected by a development. The exact parameters for the determination of visual impacts have not yet been rigidly defined and are still mostly open to interpretation. CNdV and DEAP (2006) have developed some guidelines for the management of the visual impacts of wind turbines in the Western Cape, although these have not yet been formalized. In these guidelines they recommend a buffer zone of 1km around significant heritage sites to minimize the visual impact.

The main impact is considered to be on the Mapungubwe Cultural Landscape, however taken into account the fact that the study area is outside of the Mapungubwe WHS Buffer Zone (3km) and is obscured by the extensive visual impacts of the Venetia Diamond Mine dumps, the actual visual impact is anticipated to be low.

### **Assumptions and Restrictions**

- It is assumed that the SAHRA database locations are correct
- It is assumed that the social impact assessment and public participation process of the EIA phase will result in the identification of any intangible sites of heritage potential.

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# Heritage Indicators within the Receiving Environment

## Regional Cultural Context

### Stone Age

The Stone Age sites of this area fit within the later Earlier Stone Age and the Middle Stone Age periods, and this section therefore discusses the relevant industries, beginning with the Acheulean. The rate of change seen in the lithics of the Acheulean is slow (Klein 2000), but by the later Acheulean, knappers were familiar with a more extensive range of options which become more refined in the MSA, such as the prepared core technique and blade production (Barham 2000a, Beaumont & Vogel 2006). The transition from the end of the Acheulean to the MSA is complex and controversial and has been described as the most important event to occur in the later Middle Pleistocene (Tryon 2006). Traditionally the disappearance of handaxes and cleavers has defined the MSA in South Africa. In other words, when the large cutting tools of the Acheulean seem to be replaced with points of bone or stone, industries are attributed to the MSA. However, early MSA sites are very rare and this paucity of information tends to exaggerate the differences between the Acheulean and the MSA.

In the past, a number of researchers have recognized industries that are 'transitional' between the ESA and MSA. At the 1955 Panafrican Congress the term 'First Intermediate Period' was adopted to describe this transition period between the ESA and MSA (McBrearty 1988). The term was then dropped at the Burg Wartenstein symposium of 1965 due to insufficient field evidence. However, a number of researchers still support the argument for transitional industries, and these are discussed in the sections below.

Therefore while the ESA with bifaces generally gives way to an MSA without bifaces, in some areas 'transitional' industries' defined as the Sangoan and Fauresmith have been recognized. This 'transitional' status has meant that the Sangoan is frequently referred to as a final ESA industry (Clark 1959), but some researchers consider it to represent the early MSA (Davies 1976, Van Peer *et al.* 2003). Van Riet Lowe (1947) placed the Fauresmith at the end of the ESA, while Beaumont & Vogel (2006) define the Fauresmith as the MSA, arguing that it is older than 500,000 years old. More recently a number of researchers have again been researching these industries (e.g., M. Chazan, F. Rheinhardt), and they argue that while they are problematic, they do in fact exist (McBrearty 1988). Although no good dates are available for the Sangoan, it seems to appear at approximately 300,000 years ago and is associated with the appearance of more evolved hominids (McBrearty 1988, White *et al.* 2003). The variation seen in artefacts at this time is complex and although the terms Sangoan and Fauresmith are the traditional industry names for this period, actually pigeonholing assemblages within these industries is difficult.

### Iron Age

The Early Iron Age is the best represented in this area with several Late Iron Age to be found as well. The Mapungubwe and K2 sites are the best known of the Early Iron Age sites. Sites that are culturally related to K2 and Mapungubwe have been observed on Hamilton 41 MS, Samaria 28 MS and Den Staat 27 MS. Another site related to Mapungubwe was excavated by Van Ewyk (1987) on Skutwater to the east of Greefswald. Small Iron Age sites postdating Mapungubwe and K2 have been recorded on Greefswald, including some stone-walled sites on hilltops.



Figure 6. Mapungubwe hill

T.N. Huffman has identified some of these sites as Khami type ruins. According to oral tradition, communities belonging to the Lea and Twamamba tribes, related to the Venda and the Shona-speaking people, settled in the Greefswald region in historical times.

They were followed, after c. AD 1700, by Sotho-speaking people. The seasonal presence of tsetse fly in the Lowveld during the 19th century made cattle herding difficult for the Iron Age communities (Fuller 1923). Malaria made living conditions still worse. As a result, the Greefswald area was used only for hunting from around 1900 until after the 1920s. When gold was discovered in stone-walled sites north of the Limpopo River, prospectors and treasure hunters began to search for similar sites south of the Limpopo River.

### **The Historic Era**

Mapungubwe ( 25km north of the site) was the largest settlement in the subcontinent in the 13th century AD before it was abandoned. Various communities settled in the vicinity over the next 600 years. Legends and rumours about the place were passed on from generation to generation. Karel Moerschell, a local German farmer, knew about the gold by 1911, but it was not until the 1930s that the significance of Mapungubwe became more widely known.

On 31 December 1932, a local informant, Mowena, led E.S.J. van Graan, and four others to Greefswald farm on Mapungubwe Hill where they saw stone walls and recovered gold and iron artefacts, pottery and glass beads. The finds, which received wide publicity in the media, were reported to the head of the Department of History at the University of Pretoria, Professor Leo Fouché. As a result of his intervention, the University negotiated with the owner of the property, E.E. Collins.

In a legal agreement the University took ownership of the gold and other artefacts and secured an option and contract for excavation rights. The University also successfully requested a postponement of prospecting, mining and related activities on Greefswald. In June 1933, Greefswald was bought by the Government and excavation rights were granted to the University of Pretoria.

The University established an Archaeological Committee, which from 1933 to 1947 oversaw research and excavations. Rev. Neville Jones from Zimbabwe and J.F. Schofield were appointed to undertake the first fieldwork in 1934 and 1935 and they were advised by Professor C van Riet Lowe, Director of the Bureau of Archaeology. Their work focused on Mapungubwe Hill, the southern terrace and the midden there. They briefly surveyed other similar sites in the vicinity.

From 1935-1940 six excavation seasons at K2 and Mapungubwe Hill were directed by Guy A. Gardner. The results of his work were published nearly 25 years later. Meyer (1998) describes the excavations on Greefswald between 1933 and 1940 as 'rapid, large scale excavations resulting in the recovery of valuable artefacts'. Research was hampered by 'the lack of professional archaeologists in South Africa, the lack of full-time supervision of the excavations by efficient, trained staff, the fact that adequate scientific methods for Iron Age research had not yet been developed and that the Iron Age in South Africa was virtually unknown to archaeologists. Consequently, many of the deposits on the sites were removed without the meticulous excavation and recording required. These problems inevitably resulted in a loss of irreplaceable deposits and eventually also of excavated materials [and] a lack of scientific data.'

The next phase of archaeological investigation, in 1953- 1954 and in 1968-1970, under the direction initially of the Department of Anthropology, and then of Professor J F Eloff who was appointed as Head of the newly-formed Department of Archaeology at the University of Pretoria in 1970, was more systematic and focused mainly on the southern terrace.

Over the next 25 years from 1970 to 1995, the Department of Archaeology at the University of Pretoria recognised that their first priority was to establish a firm data base by testing, correcting and supplementing the earlier research, and concentrating on reconstructing the way of life of the site inhabitants. Between 1979 and 2002 reports have been published on the human and faunal remains, Chinese porcelain, gold objects, glass beads and radiocarbon dating.

In addition, sites on neighbouring farms have been investigated by students of the University of Pretoria during the 1970s and 1980s.

Greefswald has remained the property of the State since the 1930s. Management of the farm was taken over by the provincial Department of Nature Conservation in 1992, and control was transferred to SANParks in 1999.

The proposed boundaries of the world heritage site coincide with the boundaries of the proposed Vhembe- Dongala National Park - which is still in the process of formation. It is being inscribed sequentially - with three areas properties already gazetted. These are Den Staat, Geefswald and Reidal which are areas of 'natural' landscape in which are many of the principal archaeological sites.

The aim is for SANParks eventually to acquire all the land within the proposed park or to have contractual agreement with the owners. This will allow the land to be taken out of agriculture and revert to 'natural' landscape. A chart of the current progress with land negotiations is included in the nomination. Currently there are 'in principle' agreements for 11 of the remaining 29 land units, but the timetable is missing. These are currently used for different purposes: some are being cultivated using irrigation agricultural techniques based on water extracted from the Limpopo river, some are managed as game reserves, and others are owned by the De Beers Corporation and are used to ensure water extraction, storage, and provision for that organization's diamond mining activities, which are

estimated to have a maximum working life of twenty years.- *Source – Advisory Body Evaluation*

### Previous Studies in the Surrounding Areas

The area north of the Venetia mining area up to and including the Sashe/Limpopo Confluence (SLC) has been subject to extensive historic research in the past.

### Cultural Landscape

The most prominent cultural landscape identified is the Mapungubwe World Heritage Site and Cultural Landscape. The study area lies on the southern edge of the buffer zone for this area (3 km away), however it is still recommended that the possible impacts on it be evaluated.

The following landscape types could possibly be present in the study area.

Landscape Type	Description	Occurrence still possible?	Likely occurrence?
1 Paleontological	Mostly fossil remains. Remains include microbial fossils such as found in Baberton Greenstones	Yes, sub-surface	Unlikely
2 Archaeological	Evidence of human occupation associated with the following phases – Early-, Middle-, Late Stone Age, Early-, Late Iron Age, Pre-Contact Sites, Post-Contact Sites	Yes	Unlikely
3 Historic Built Environment	<ul style="list-style-type: none"> <li>- Historical townscapes/streetscapes</li> <li>- Historical structures; i.e. older than 60 years</li> <li>- Formal public spaces</li> <li>- Formally declared urban conservation areas</li> <li>- Places associated with social identity/displacement</li> </ul>	No	No
4 Historic Farmland	These possess distinctive patterns of settlement and historical features such as: <ul style="list-style-type: none"> <li>- Historical farm yards</li> <li>- Historical farm workers villages/settlements</li> <li>- Irrigation furrows</li> <li>- Tree alignments and groupings</li> <li>- Historical routes and pathways</li> <li>- Distinctive types of planting</li> <li>- Distinctive architecture of cultivation e.g. planting blocks, trellising, terracing, ornamental planting.</li> </ul>	No	No
5 Historic rural town	<ul style="list-style-type: none"> <li>- Historic mission settlements</li> <li>- Historic townscapes</li> </ul>	No	No
6 Pristine natural landscape	<ul style="list-style-type: none"> <li>- Historical patterns of access to a natural amenity</li> <li>- Formally proclaimed nature reserves</li> <li>- Evidence of pre-colonial occupation</li> <li>- Scenic resources, e.g. view corridors, viewing sites, visual edges, visual linkages</li> <li>- Historical structures/settlements older than 60 years</li> <li>- Pre-colonial or historical burial sites</li> </ul>	Yes	Likely

	<ul style="list-style-type: none"> <li>- Geological sites of cultural significance.</li> </ul>		
7 Relic Landscape	<ul style="list-style-type: none"> <li>- Past farming settlements</li> <li>- Past industrial sites</li> <li>- Places of isolation related to attitudes to medical treatment</li> <li>- Battle sites</li> <li>- Sites of displacement,</li> </ul>	No	Unlikely
8 Burial grounds and grave sites	<ul style="list-style-type: none"> <li>- Pre-colonial burials (marked or unmarked, known or unknown)</li> <li>- Historical graves (marked or unmarked, known or unknown)</li> <li>- Graves of victims of conflict</li> <li>- Human remains (older than 100 years)</li> <li>- Associated burial goods (older than 100 years)</li> <li>- Burial architecture (older than 60 years)</li> </ul>	Yes,	Unlikely
9 Associated Landscapes	<ul style="list-style-type: none"> <li>- Sites associated with living heritage e.g. initiation sites, harvesting of natural resources for traditional medicinal purposes</li> <li>- Sites associated with displacement &amp; contestation</li> <li>- Sites of political conflict/struggle</li> <li>- Sites associated with an historic event/person</li> <li>- Sites associated with public memory</li> </ul>	No	No
10 Historical Farmyard	<ul style="list-style-type: none"> <li>- Setting of the yard and its context</li> <li>- Composition of structures</li> <li>- Historical/architectural value of individual structures</li> <li>- Tree alignments</li> <li>- Views to and from</li> <li>- Axial relationships</li> <li>- System of enclosure, e.g. defining walls</li> <li>- Systems of water reticulation and irrigation, e.g. furrows</li> <li>- Sites associated with slavery and farm labour</li> <li>- Colonial period archaeology</li> </ul>	Yes	No
11 Historic institutions	<ul style="list-style-type: none"> <li>- Historical prisons</li> <li>- Hospital sites</li> <li>- Historical school/reformatory sites</li> <li>- Military bases</li> </ul>	No	Unlikely
12 Scenic visual	<ul style="list-style-type: none"> <li>- Scenic routes</li> </ul>	Yes	Mapungubwe Cultural Landscape
13 Amenity landscape	<ul style="list-style-type: none"> <li>- View sheds</li> <li>- View points</li> <li>- Views to and from</li> <li>- Gateway conditions</li> <li>- Distinctive representative landscape conditions</li> <li>- Scenic corridors</li> </ul>	No	No

# The Mapungubwe Cultural Landscape

*The following extract is taken mostly verbatim from the January 2002 World Heritage Nomination Dossier. This was found to be the best discussion on the Mapungubwe Cultural Landscape. Some sections were edited to conform to contemporary definitions.*

## Description of property

### General description of the property

The Mapungubwe Cultural Landscape is situated in the physiographic region known as the Lowveld in an ancient valley that includes the confluence of the Shashe and Limpopo Rivers. These rivers drain an extensive area and form the international border between South Africa in the south, Botswana in the north west and Zimbabwe in the north east. Geologically, the core area of the Mapungubwe Cultural Landscape (MCL) is centred on a relatively isolated outcrop of sandstone hills, underlain by red mudstones and intruded by dolerite dykes. The formation is part of the Karoo System. The sandstones are up to 300 m thick in places. They are stratigraphically correlated with the Clarens Sandstone Formation, formerly known as Cave Sandstone, that formed during the Triassic between 225 and 190 million years ago and they contain fossils of that time period (Kent 1980:542). Partial skeletons of *Massospondylus* sp. have been found on Greefswald, Weipe and Schroda and across the border in Zimbabwe, and their footprints at Pont Drift have been declared a national monument. The sandstones have been used in other parts of South Africa as well as in the MCL as ideal surfaces for rock paintings. The dolerites are intrusive and date to between the late Triassic and the Cretaceous. Most of the land in the core area is between 500 and 630 m above mean sea level. The climate is sub-tropical with rare frost and mean daily temperatures of about 17°C in winter and 25°C in summer. Rain falls mainly in summer but is erratic both seasonally and from year to year and ranges from 140 to 500 mm per annum. Part of the reason for the low rainfall is that the MCL lies at a low altitude of less than 500 m above sea level and is in the rain shadow of the higher and more extensive Soutpansberg range to the south and east. Vegetation on the soils derived from mudstones and sandstones is classified as Mopane Veld, a Savannah Bushveld dominated by the shrub *Colophospermum mopane*. The mopane tree grows to a full height of 6 metres when it is established on deep sandy soils, but in most of the Mapungubwe Cultural Landscape its growth is stunted by shallow soil and limited water. Along the Kalompe River on the farms Little Muck and Den Staat, there are numerous tall mopane trees in the deep alluvial soils, together with a variety of acacias and other trees such as marula and baobab (*Adansonia digitata*), riverine species and grasses. A list of plants recorded and expected in the area is included in the Preliminary Park Management Plan. The combination of soils derived from the rocks of the Karoo System, regular flooding of the Limpopo and its tributaries, good grazing and browsing lands and dry mopane leaves for fodder during the winter, provided the natural resources for both agriculture and stock farming that were needed to sustain a large population when the leaders at Mapungubwe were at the height of their power. The core area is about 35 km from Pont Drift in the west to Schroda in the east, and is mostly less than 10 km from the Limpopo River in the north to the tarred road linking Pont Drift and Messina in the south. The 24 original farms, some of which have been subdivided over the years, comprise 28 168.66 ha.

The principal properties are the Vhembe-Dongola National Park in which some land is owned by SANParks and the rest is owned privately but is managed by SANParks as a contractual park. The farms in the core area are listed in Table 4.1. The following properties are in the buffer zone which, added to the core, comprises a total of about 100 000 ha. Venetia-Limpopo Nature Reserve De Beers Vhembe Nature Reserve Leif Rahmqvist Limpopo Valley Game Reserve Various private owners During the twentieth century large tracts of land along the Limpopo River were developed for commercial farming where irrigation was possible. This has changed the character of the floodplain in certain areas, particularly on farms on the eastern border of the core area. Over the past few decades, however, there has been increasing interest in nature conservation. Most of the properties acquired by

SANParks and those contracted to it are now exclusively devoted to nature conservation and game viewing and most of the land in the buffer zone has similar land use. As a result of the establishment of the Peace Parks Foundation in 1997, government has entered into discussions with Botswana and Zimbabwe about the possibility of establishing a Trans-Frontier Conservation Area (TFCA). It is envisaged that this will include the Mapungubwe Cultural Landscape core area and buffer zone on the South African side. The intention would be to add the Tuli Block and Southern Tuli Game Reserve in Botswana and the Tuli Circle, Maramani Communal area, Sentinel Ranch and Nottingham Estates in Zimbabwe to the buffer zone. On-going negotiations with Botswana and Zimbabwe will help to identify management issues and how these should be addressed. When this conservancy area has been consolidated, fences will be removed. The Park area will then include a large number of game animals such as elephant, giraffe, hippopotamus, impala, waterbuck, kudu, eland, bushbuck, mountain reedbuck, klipspringer, blue wildebeest, bushpig, warthog, aardvark, leopard, lion, cheetah, zebra, monkey, baboon and a variety of smaller mammals. The TFCA has excellent potential as a "big five" conservation area. Viable populations of lion, leopard, and cheetah still occur, and the population of 900 (September 2000 census) elephants in the Tuli Block in Botswana is the largest population on private land in Africa. Ungulates already present include eland (*Taurotragus oryx*), impala (*Aepyceros melampus*), blue wildebeest (*Connochaetes taurinus*), Burchell's zebra (*Equus burchelli*), Sharpe's grysbok (*Raphicerus sharpei*), and steenbok (*Raphicerus campestris*), and there is suitable habitat for both black and white rhino (*Diceros bicornis* and *Ceratotherium simum*). The area also has 19 Red Data Book mammals. No detailed information is available on birds, reptiles and amphibians found specifically within the TFCA, although the area around the confluence of the two rivers is known to have a great diversity of birdlife. Three main vegetation communities are recognized in the region: the riparian fringe occurs along the main rivers and their tributaries, the Acacia-Salvadora community occurs on the Limpopo flats and vlei areas, and the mixed western mopane veld occurs on ridges and flats south of the riparian fringe and flood plains. Twenty-six Red Data Book plant species have been recorded in the area. Large areas of the proposed TFCA have been severely disturbed and degraded due to previous intensive agricultural farming activities in the core area.

Introductions of mammals into the Venetia Limpopo Nature Reserve in the buffer zone include 44 elephants from 1991-1994, 10 roan *Hippotragus equinus*, 10 sable *Hippotragus niger* and 20 tsessebe *Damaliscus lunatus* in 1994. A major constraint to the movement of animals in the area is the presence of the veterinary cordon fence and an electrified military barrier on the South African side of the Limpopo River, and this needs to be addressed urgently. Once established, this TFCA has the potential to be a significant sanctuary for wild dog, black rhino and elephant and for the 16 other Red Data Book species. Wild dog and elephants in particular would benefit from the larger area of the TFCA. The Limpopo/Shashe TFCA with its wealth of wildlife and scenery and its cultural/historical assets has the potential to become a major new tourist destination in southern Africa. Existing tourist facilities are mainly restricted to a small number of privately run lodges in Botswana (which already attract about 20,000 visitors each year), and an even smaller number within South Africa. In Zimbabwe, the Tuli Circle Safari Area in Zimbabwe is used extensively for hunting under permit. The proposed national park on the South African side of the TFCA could attract 30,000 additional visitors per year. All three countries have potential for private sector investment in ecotourism development.

### **History of research in the Mapungubwe Cultural Landscape**

Mapungubwe was the largest settlement in the sub-continent in the thirteenth century AD before it was abandoned. Various communities settled in the vicinity over the next 600 years. Legends and rumours about the place were passed on from generation to generation. Karel Moerschell, a German farmer based at the western end of the Soutpansberg in the area of present-day Vivo, knew about the gold by 1911. He published a book called *Der Wilde Lottrie* about a man named Lotrie Lottry, an elephant hunter who left Schoemansdal and lived as a recluse in the Limpopo Valley. Lottry is reputed to have stayed in the rock shelter on the western end of Mapungubwe Hill and to have removed a pot filled with gold from the hilltop (Edwin Hanisch, pers. comm. December 2001). It is said that he buried it

somewhere below the hill, but it was not until the 1930s that the reasons for the significance of Mapungubwe became more widely known. On 31 December 1932, the son of a local informant, Mowena, led E.S.J. van Graan, his son and three other men to Mapungubwe Hill on the farm Greefswald. They saw stone walls, gold and iron artefacts, pottery and glass beads there and realised its importance. They returned on New Years Day 1933 and recovered more items, including the contents of a grave with more gold objects. The finds, which received wide publicity in the media, were reported to the head of the Department of History at the University of Pretoria, Professor Leo Fouché. As a result of his intervention, the University negotiated with the owner of the property, E.E. Collins. In a legal agreement the University took ownership of the gold and other artefacts and secured an option and contract for excavation rights. The University also successfully requested a postponement of prospecting, mining and related activities on Greefswald. In June 1933, Greefswald was bought by the Government and excavation rights were granted to the University of Pretoria (Meyer 1998:19-20).

As there was no Department of Archaeology at the University of Pretoria at that time, the University established an Archaeological Committee from 1933 to 1947 to oversee research and excavations that began in 1934. Rev. Neville Jones from Zimbabwe and J.F. Schofield were appointed to undertake the first fieldwork in 1934 and 1935 and they were advised by Professor C van Riet Lowe, Director of the Bureau of Archaeology. Their work focused on Mapungubwe Hill, the southern terrace and the midden then known as Bambandyanalo, but later named K2. They also noted the stone walling, now known to belong to the later Venda period, on Bambandyanalo Hill that lies between K2 and Mapungubwe, and they briefly surveyed other similar sites in the vicinity. From 1935-1940 six excavation seasons at K2 and Mapungubwe Hill were directed by Guy A. Gardner who was called up for military service in 1940 and was unable to continue after the War. The results of his work were published nearly 25 years later (Gardner 1963). Without the benefit of comparative studies, and influenced by incorrect conclusions from the analysis of human skeletal remains from graves at K2 by Galloway (1959), Gardner believed that the earliest inhabitants at K2 and Mapungubwe Hill were Khoekhoe ("proto-Hottentot" in his terminology) who were supplanted by Iron Age Nguni immigrants. Galloway's conclusions were later corrected by Rightmire (1970) who demonstrated that all the people buried on Greefswald fell within the range of variation of the negroid population associated with the Iron Age throughout Southern Africa. Meyer (1998:23) describes the excavations on Greefswald between 1933 and 1940 as "rapid, large scale excavations resulting in the recovery of valuable artefacts". Research was hampered by "the lack of professional archaeologists in South Africa, the lack of full-time supervision of the excavations by efficient, trained staff, the fact that adequate scientific methods for Iron Age research had not yet been developed and that the Iron Age in South Africa was virtually unknown to archaeologists. Consequently, many of the deposits on the sites were removed without the meticulous excavation and recording required ... These problems inevitably resulted in a loss of irreplaceable deposits and eventually also of excavated materials [and] a lack of scientific data". The next phase of archaeological investigation, in 1953-1954 and 1968-1970, under the direction initially of the Department of Anthropology, and then of Professor J F Eloff who was appointed as Head of the newly-formed Department of Archaeology at the University of Pretoria in 1970, was more systematic and focused mainly on the southern terrace. Over the next 25 years from 1970 to 1995, the Department of Archaeology at the University of Pretoria recognised that their first priority was to establish a firm data base by testing, correcting and supplementing the earlier research, and concentrating on reconstructing the way of life of the site inhabitants (Eloff 1979). A summary of the results of this work was published by Professor Andrie Meyer (1998) who became Head of the Department of Archaeology several years after the retirement of Professor Eloff. Specialist reports have been published on the faunal remains (Voigt 1983), human skeletal remains (Steyn & Henneberg 1994, 1995b, 1996, 1997; Steyn & Nienaber 2000), Chinese porcelain (Meyer & Esterhuizen 1994), gold objects (Oddy 1984; Miller et al. 2000), glass beads (Saitowitz et al. 1995; Wood 2000) and radiocarbon dating (Vogel 1998, 2000).

In addition to the fieldwork and research done on Greefswald, sites on neighbouring farms were also investigated by students of the University of Pretoria during the 1970s and 1980s.

The most significant of these were Schroda and Pont Drift (Hanisch 1980, 1981a, 1981b) and Skutwater (Van Ewyk 1987). Since the early 1990s, Professor T N Huffman, Dr Simon Hall and students from the Department of Archaeology at the University of the Witwatersrand in Johannesburg have been surveying and excavating sites to the west of Greefswald at Leokwe Hill, Little Muck and Balerno (Calabrese 1997, 1998, 2000a, b; Hall & Smith 2000; Huffman 2000; Smith & Hall 1999). A comprehensive list of known sites in the core area of the Mapungubwe Cultural Landscape, in the buffer zone, and in Botswana and Zimbabwe, has been compiled by Huffman and is synthesised in Figures 6-8. The list also contains all rock art sites recorded during field surveys in the core area and adjacent properties in Zimbabwe by Palaeo-Art Services, a voluntary organisation co-ordinated by Ed Eastwood. Greefswald has remained the property of the State since the 1930s. Access was restricted during the 1970s, 1980s and early 1990s when the property was used by the South African Defence Force because of its strategic position on the border with Botswana and Zimbabwe. Management of the farm was taken over by the provincial Department of Nature Conservation in 1992, and control was transferred to SANParks in 1999.

The significance of the geographical positioning of the Mapungubwe Cultural Landscape is evident from the large number of archaeological sites that cover a wide range of time periods from the Earlier Stone Age at least 500 000 years ago, through to the nineteenth century AD. The combination of the riverine environment and the sandstone hills has provided a focus for human settlement whenever climatic conditions have been favourable. The Southern African landscape was occupied for hundreds of millennia by indigenous Stone Age hunter-gatherers who were the ancestors of the San (Bushmen). Within the core area there are at least 26 sites that they were occupied during the Stone Age. Earlier Stone Age people camped near the river between about 0.5 million and 250 000 years ago. They were followed by Middle Stone Age groups who occupied open sites and used rock shelters as well. From about 20 000 years ago, Later Stone Age people were also using both rock shelters and open sites. Their artefact assemblages began to include tools such as bows and arrows and ornaments such as ostrich eggshell beads that were still being used by their San descendants up to a few centuries ago. Within the last five or ten thousand years, the hunter-gatherers also made rock paintings and engravings. When Bantu-speaking Iron Age farmers with domesticated crops and livestock migrated southwards into the region from West Africa about two millennia ago, some hunter-gatherers acquired domesticated stock from them and became herders with sheep and cattle. These early herders may have been people of San descent and are usually referred to as the Khoekhoen. The term Khoisan refers to both the San and the Khoekhoen as the first indigenous people of the sub-continent. Apart from characteristic Bambata pottery which is the earliest pottery in the regional sequence, and the rock art which includes paintings of sheep and 'finger' paintings ascribed to herders, however, there is no archaeological evidence of Khoekhoen herder settlement in the Mapungubwe Cultural Landscape. It is generally assumed that the herders moved fairly rapidly southwards ahead of the Iron Age migration and settled mainly in the south-western part of Southern Africa.

The earliest Iron Age farmers in the Mapungubwe Cultural Landscape (MCL) have left archaeological traces of their presence in the form of pottery and middens dating from about AD 350 in the region. The pottery is classified as Happy Rest after the name of the site in the Soutpansberg where it was first described. The population remained small and was constrained by changes in the rainfall regime so that at times, such as between AD 600 and 900 when temperatures were cooler and rainfall was low, there is no evidence for the presence of farmer settlements. Three phases can be identified within the main occupation period of the MCL.

The transition from Stone Age to Iron Age in the Mapungubwe Cultural Landscape began during the first millennium AD. It is not the main focus of this nomination, but as the San recorded aspects of this change in their rock art, some background is provided before proceeding with a detailed description of the sites dating to the Mapungubwe Cultural Landscape period from AD 900-1300. The description is divided into the following time periods:

**Transition from Stone Age to Iron Age** between AD 250-900 when indigenous Later Stone Age foragers (San hunter-gatherers) were gradually replaced and absorbed by immigrant herders and agriculturists as the main inhabitants of the Limpopo Valley. The herders and agriculturists are associated with pottery known as Bambata and Happy Rest respectively.

**Phase 1:** the Zhizo Period. Iron Age farming communities, whose settlements were organised around a central cattle kraal, established themselves when climatic conditions improved after AD 900 and grew in number between AD 900-1020, developing trade links with the east coast;

**Phase 2:** the Leopard's Kopje / K2 Period. Ancestors of the Shona-speaking people of Southern Africa replaced the Zhizo people but remained organised around the central cattle pattern between about AD 1020 and 1220. As commoner and ruling classes became differentiated, the integrity of the central cattle pattern began to weaken towards the end of this phase.

**Phase 3:** the Mapungubwe Period. A socially stratified Late Iron Age kingdom at Mapungubwe, dating to AD 1220-1300, developed strong trade links with the east coast and dominated the landscape for at least 70 years.

After the onset of less favourable climatic conditions, it was no longer possible to sustain a large population and the Mapungubwe kingdom dispersed, although small communities stayed behind. During later power struggles, especially in what is now the country of Zimbabwe, small groups of people moved in and out of the Mapungubwe area. Within the Mapungubwe Cultural Landscape these movements are recorded in the various pottery styles and settlement layouts at more than 100 sites dating to the Icon/Zimbabwe, Khami and Venda periods of occupation between AD 1300 and 1800. Even though population numbers and alliances did not remain static, the ideology for social stratification that developed at Mapungubwe remained a strong element in subsequent Zimbabwe, Khami, Shona and Venda culture. The archaeological evidence that has enabled these generalisations to be made is summarised below.

### Transition from Stone Age to Iron Age

Early Iron Age people are known to have lived in the MCL between about AD 500 and 700 when the region received sufficient rainfall for sorghum to be grown and grass to grow for cattle and small stock. Happy Rest pottery that dates to this period has been found on the southern terrace and in eroded areas north of the hill at Mapungubwe (Meyer 1997, 1998) and on the top of several steep-sided hills that were apparently used at that time for rain-making. Little more is known about this time period, however, as an episode of lower rainfall between about AD 700 and 900 led to a population reduction and there is little physical evidence of the presence of Iron Age people during that time. In a survey by Palaeo-Art Field Services (Eastwood 2001), 150 rock art sites have been recorded in the Limpopo Shashe Confluence Area. These include 40 sites in Zimbabwe. There are therefore 110 rock art sites in the MCL and on adjacent farms. The sample of 150 includes 139 painted sites and 56 engraving sites, with most of the engravings found at the same sites as paintings. There are several different traditions that can be correlated with the cosmology of San hunter-gatherers and Khoekhoe herders and there are two examples of paintings by Iron Age people. The Limpopo valley is one of the rare instances in the sub-continent where rock paintings and rock engravings occur at the same place. In the MCL they are found together in rock shelters on the farms Balerno and Schroda. Three rock art sites have been excavated and the deposits provide detailed information on the sequence of events during the transition from the Stone Age to the Iron Age. The excavated sites are Little Muck and Balerno shelters in the MCL and Salt Pan Shelter about 100 km to the south in the Soutpansberg, outside of the proposed MCL. Additional detail about the transition can be inferred from the rock art. Little Muck Shelter (Hall & Smith 2000), with occupation deposits

about 1 m thick, provides the most complete sequence from which to gauge the nature and tempo of the process of change from foraging to agriculture in the MCL. Like Salt Pan Shelter, Balerno and sites on the Botswana side of the Limpopo, the first occupation was in the period just prior to the introduction of pottery about 2000 years ago. Activity intensified thereafter because the foragers established an interactive relationship with their agriculturist neighbours at Leokwe Hill (in the case of Little Muck). A similar symbiosis has been recorded between foragers and early Iron Age communities further south in the Soutpansberg at Salt Pan Shelter and in the Waterberg (Van der Ryst 1998). When compared with the pre-ceramic deposits at the base of the Little Muck sequence that are dated by inference to pre-250 AD, the deposits associated with the earliest Happy Rest/Bambata pottery have higher numbers of stone scrapers. These stone tools were used for preparation of hides. This suggests to Hall and Smith (2000:34) that the foragers were preparing hides for exchange with agriculturists. In the overlying deposit with Leokwe-Zhizo pottery that dates between 1000 and 1100 AD, this activity was further intensified. In contrast, in the uppermost layers associated with K2 and Mapungubwe pottery, dating between 1100 and 1300 AD, formal stone tools, worked bone, shell and ochre are either absent or occur in very small quantities.

The interpretation is that these uppermost layers that post-date 1050 AD, and include glass beads, iron artefacts and K2 and Mapungubwe period pottery, were the result of occupation of the shelter not by the Later Stone Age foragers, but by people from the agriculturist community that was established by that time at nearby Leokwe Hill. After that time, foragers became excluded from barter and farmers appropriated craft exchanges and their sites. This appropriation is further emphasised by the presence of fourteen gaming 'boards' that were carved into the sandstone in front of Little Muck Shelter (Photo 19). These 'boards' are often found associated with Zhizo and Leopard's Kopje sites. In the recent past, they have been made and used exclusively by men in Shona, Venda, Shangaan and Tsonga-speaking communities. It is likely that this tradition has been a common practice for a long time. Schmidt (1995) makes reference to the fact that some Khoekhoen peoples believed that this "cloud game" or "African chess" was placed on the rock by their god, Heiseb, and was mystically linked to rain. Although the rock paintings at Little Muck Shelter cannot be directly dated, the absence of ochre in the uppermost deposits is strong circumstantial evidence that the paintings were done prior to about 1050 AD when the site was taken over by Iron Age farmers. Three traditions of rock painting have been identified in the MCL, Limpopo-Shashe Confluence Area and surrounding Soutpansberg region.

1. The majority of the paintings are in the earliest tradition of finely detailed images that reflect beliefs and cosmology common to the San diaspora of the past five thousand years or more. Most are in red ochre, with some in black and white. Eastwood's (2001:25) survey shows that human figures are more common than any other category (45.7%), followed by animals (42.3%), items of clothing such as loin cloths and aprons (8.8%), and lines, dots, nets, animal spoor and therianthropes (3.2%). The analysis of human figures in the rock paintings shows that those of uncertain gender were the most common (48%), followed by women (28%) and men (24%). This is unusual in the southern African context as images of men usually predominate. Another unusual feature in the rock art that is also related to gender, is the high incidence of paintings of women's leather aprons with smaller numbers of paintings that probably represent loin cloths worn by men. In the animal category, indeterminate animals were most common, followed by kudu, giraffe, elephant, impala, tsessebe, fish, eland, ostrich, locust, rhinoceros, fat-tailed sheep and other animals of lesser significance. The paintings of domesticated fat-tailed sheep can be dated because herders and immigrant farmers in the first millennium AD introduced them. As the sheep are in the same style as the more conventional San paintings, the hunter-gatherers rather than the herders probably did them.
2. Mostly overlying the San tradition images, but sometimes underlying them, are geometric paintings. The paint, in red, orange and white, was applied with a finger. Paintings in this tradition are less common than those of the San, but are distributed

throughout the region. There is no clear evidence of who the artists were, but they are generally thought to have been herders with sheep who moved through the region briefly between the time of the first establishment of Iron Age agriculturist communities and about AD 900. Similar geometric paintings and engravings are found in other regions of Southern Africa as well. They may be the work of Khoespeaking herders, related to the San, who acquired sheep and, later, cattle from Iron Age farmers. They moved southwards into the western half of what is now South Africa about 2000 years ago. Apart from the rock art there is as yet no other archaeological trace known of Khoekhoen presence in the MCL.

3. Overlying the earlier rock art traditions are what have been called 'late white' paintings. They are typical of those done by Bantu-speaking people in east, central and southern Africa, and more specifically by ancestors of the modern Sotho-Tswana cultural group. They are considered to date to the period after 1300 AD (Hall & Smith 2000:39) and are further evidence for the appropriation of places that had previously been used by others.

The rock art, particularly that done in the San tradition, together with the archaeological evidence from Little Muck Shelter, provides a valuable commentary by the indigenous people themselves on the historical process in the MCL in the first millennium AD. In general terms, the process culminated in the appropriation by herders and farmers of places that had been used exclusively by hunter-gatherer-foragers. It led to the disappearance (and/or assimilation) of the San and ultimately to the rise of social stratification and attendant cultural and economic development at Mapungubwe. More specifically, the covering of San art by the art of herders and farmers symbolically cut off the power of the older images of the spirit world and the religious beliefs that generated them. In this context, argue Hall & Smith (2000:43), San paintings of sheep "may represent a San attempt to neutralise or overcome the power of the herders; certainly they symbolise the extent to which the new herder population threatened San life." The distribution map of rock art sites illustrates, too, that from the first millennium AD, Iron Age people were occupying much the same landscape as the hunter-gatherers. The absence of San paintings of images that could be linked to the Mapungubwe period is further evidence that the power and presence of the hunter-gatherers had been changed radically by early in the second millennium. Historical records, however, relate that people of mixed San and Sotho descent were living in the wider area in the nineteenth century and that they were engaged in rainmaking, a practice that was carried on by San people in many parts of Southern Africa. The assimilation of hunter-gatherers into the dominant economy of the farmers was therefore a long and complex process.

### ***Phase 1: the Zhizo Period***

By AD 900, communities recognised archaeologically by their characteristic Zhizo-style pottery had established themselves in the Mapungubwe Cultural Landscape and in southwest Zimbabwe and parts of eastern Botswana. Zhizo is named after the site in Zimbabwe where this pottery was first described (Robinson 1960, 1966; Huffman 1974). There are 23 recorded Zhizo sites in the MCL. By this time, the climate had improved with more reliable rainfall for crops after a 200-year period of cooler temperatures and persistent drought. Later Stone Age communities had either moved away or assimilated with the farmers, possibly intermarrying and assisting them with rain-making. Herders seem to have moved southwards, and trade – initially with ivory and hides in exchange for glass beads and possibly woven cloth – had begun with people along the east coast. Excavated sites with characteristic Zhizo pottery have calibrated radiocarbon dates within the time range from 790-1020 in Zimbabwe, the Limpopo Valley (including the MCL) and adjacent regions of Botswana (Vogel 2000). The pots have bands of oblique incision and comb-stamping on the lower rim, stamped triangles on the upper shoulder, followed by a horizontal line of stamping (Huffman 2000). Excavations at Pont Drift (Hanisch 1980) show that the Zhizo pottery decoration motifs persisted in the region for about 200 years and were replaced around 1000 AD by what has been called K2 or Leopard's Kopje.

The largest Zhizo site thus far excavated is on the farm Schroda, immediately east of the farm Greefswald on the eastern side of the MCL core area (22.11.29 South, 29.25.45 East). It is situated on top of a rocky plateau overlooking the Limpopo Valley to the north (Hanisch 1981). The site, about 500 x 300 m in extent, is a Central Cattle Pattern complex that consists of middens and fragments of gravel house floors that built up over a period of about 100 years from 900 AD. A series of natural rock outcrops have been interfilled with deposit giving the impression of natural terraces. The landscapes selected by Zhizo people for settlement tend to be set back from the Limpopo River, like Schroda. As they were the first pioneer farmers to entrench themselves in this environment, it is likely that they had to overcome a number of obstacles before they could farm successfully. These obstacles would have included damage to their crops by elephants and hippo, flooding along the river, and woodland that had to be cleared for crops and villages. The successful utilisation of the natural resources required sustained social organisation so that the people could generate enough food for the growing population. Trade and agriculture therefore went hand-in-hand at this time and farming practices were focused on the cultivation of crops as well as on herding cattle, sheep and goats. Schroda is significant for the history of the MCL because of its size and its midden contents, because it is the earliest site in the Limpopo Valley with exotic glass beads and a large amount of worked ivory, and because it yielded an extraordinary cache of ceramic (baked clay) figurines. The implications of these characteristics are:

- **Size:** Judging from the size of the site at Schroda, which is at present the largest known Zhizo site in Southern Africa, it is estimated to have housed between 300 and 500 people. This in turn implies a level of political power that is not evident at any other sites in the MCL at this time. From information currently available, there are twenty-five smaller Zhizo sites within a 40km radius of Schroda on both sides of the Limpopo and the Shashe. The system of political hierarchy in place at that time implies that a chief would have been resident at the Schroda capital, with lesser leaders such as headmen in charge of the smaller settlements.
- **Middens:** Ashy middens with refuse consisting of broken potsherds and food remains were found throughout the site. A large quantity of faunal remains – in excess of 140 000 bone fragments - was examined, of which just over 19 000 bones were identifiable. They represented 263 sheep/goats, 201 cattle, 6 dogs, two species of fish and 701 individuals from 52 species of mainly small, non-domesticated animals (Voigt 1983). This is one of the larger samples of identifiable faunal remains from any site in the MCL (Plug 2000). The remains indicate that the primary source of meat was sheep, goats and cattle (in that order), supplemented by game, fish from the river. The staple food was cultivated sorghum.
- **Pottery:** Over 100 000 potsherds were recovered from the excavations at Schroda. The decorative motifs and shapes were essentially similar to Zhizo ware first described in Zimbabwe, but the majority were bowls rather than pots, and black and red wares were rare.
- **Glass beads** were found in sufficient quantity (664) (Wood 2000) to suggest that they were the result of direct trade with the east coast (Huffman 2000). Although similar beads have been recovered from Chibuene on the Mozambique coast, (Sinclair 1982), their ultimate origins are unknown (Wood 2000:87). They are comparable with beads of similar antiquity from several Zhizo sites in south-eastern Zimbabwe, including Makuru and Zhizo Hill.. This, and the presence of cowrie shells, implies that Schroda was already part of a regional trade network.
- **Worked ivory** indicates a surplus over immediate needs, with the implication that this surplus was used as an item of exchange in trade with the east coast.

- **Clay figurines:** Clay figurines were found in small numbers throughout the site, but nearly 2000 fragments were recovered in one small area. The evidence suggests that the figurines – of animals, humans and combinations of both – were used there in a special ritual and were broken prior to burial. Distinct clusters of figurines of mainly domesticated animals usually associated with male initiation were found on one side of this special area, and on the other side were mainly larger figurines of mythical wild animals usually associated with female initiation in ritual practices amongst early twentieth century Venda (Hanisch 1981). . The most common form is a stylised bird, followed by human-like figures and animals of various kinds, both wild and domesticated. The large quantity and sophistication of the figurines implies rites-of-passage ceremonies controlled by the chief that included young women and men from settlements beyond Schroda itself. Huffman (2000:17) notes this as evidence of Schroda’s chiefly status.
- **Metal working:** Fragments of copper and iron were recovered from middens, in addition to small pieces of tuyère and slag, probably relating to copper and iron forging on a small scale.

Taken together, the information gathered from the excavations at Schroda and the distribution of other Zhizo sites indicates that a hierarchy related to growing political power and the unequal distribution of wealth had begun to form in the region, but the Central Cattle Pattern still dominated. Men and cattle and associated activities were placed in the centre of the settlement together with the court of the chief. This was surrounded by houses where the women lived. The senior leader was able to accumulate wealth in the form of cattle by imposing death dues, court fines, forfeits, tributes, raids and a high bride-price for his daughters (Huffman 2000:17). As a result, he had more wives, followers, court officials and associated houses in his settlement than the headmen in surrounding settlements who paid tribute to him and did not accumulate tribute themselves. Judging from the large number of glass beads and cowrie shells, and from the quantity of ivory worked at Schroda, the chief was already engaged in direct trade with the east coast and the Indian Ocean network. According to Arab documents quoted by Huffman (Burke 1962; Freeman-Grenville 1975; Huffman 2000:19), Swahili traders reported finding new ivory sources in the Sofala-Bazaruto area of present-day Mozambique in the 9th century AD. Some of the early coastal trading stations have been found (Sinclair 1982). At the other end of the trade network, sites in the Waterberg to the south and in Botswana to the west that were occupied contemporaneously with Schroda and have related pottery styles, and have the same kind of glass beads as those from Schroda, but in much smaller quantities. As Schroda is the only likely source for these beads (Huffman 2000:20), its influence was wider than the MCL and buffer zone. After about a century, Schroda was abandoned. In its place, a new capital was established and an immigrant group introduced a new pottery style. Schroda’s chief probably left with the majority of his people. One of the successors to Zhizo pottery is found at Toutswe in Botswana, suggesting that Schroda people moved westwards as a result of this takeover.

### ***Phase 2: The Leopard’s Kopje / K2 Period***

The K2 phase in the MCL dates from about AD 1020-1220 (Huffman 2000). Of the 89 sites in the MCL where Leopard’s Kopje / K2 pottery has been recorded, only a few (e.g. Hanisch 1980), were occupied previously by Zhizo people. This indicates that there was little or no continuity between the two periods and in a detailed regional study of pottery by Huffman (1984) he has concluded that Zhizo and Leopard’s Kopje had separate origins. The implication is that a new group of people – believed to be the ancestors of the present-day Shona - moved into the area and usurped the power of the chief at Schroda around AD 1000. They then established a capital about 7 km to the south-west at the site known as K2 on the farm Greefswald.

- K2 Midden. A huge midden complex on the farm Greefswald dominates the landscape and shows the location of the capital that replaced Schroda as the largest settlement during the K2 period. The site was called K2 by Gardner when he excavated there in the 1930s. He had excavated in Egypt where a midden was called a 'kom' and he used the same word for this one as a matter of convenience. The word has no local significance. Calibrated radiocarbon dates at K2 have a fairly tight range between AD 1000 and 1220 (Meyer 1998; Vogel 2000). The deposits at K2 cover an area of about 5 ha and consist not only of settlement debris and refuse, but also of ash and of weathered manure in the central cattle kraal. Huffman (2000) estimates that between 1000 and 2000 people lived there. The midden complex is at least 100 m long and up to 6 m deep. Analysis of the spatial distribution of the remains indicates that the site began with a central cattle kraal surrounded by pole and daga houses and grain bins as would be expected in a settlement laid out according to the Central Cattle Pattern. The cattle were later moved elsewhere, partly because their value changed when beads and cloth replaced them as status symbols. The debris that then accumulated in the kraal probably relates to an increase in the number of court cases heard by the chief and his councilors as their power grew. The court is traditionally placed adjacent to the kraal and African hospitality ensures that visitors must be given sufficient food and drink during their stay. Excavations away from the central kraal have shown burnt pole and daga houses and mudstone gravel floors with associated smaller middens in homestead areas to the east, west, north and south, and on the slope of Bambandyanalo Hill. A midden on the eastern side, labelled K1, is another dump area related to K2 (Meyer 1998).

The midden at K2 gives the first evidence of substantial impact on the natural landscape. In addition to the physical presence of the remains of the settlement there and at contemporary sites in the valley, there was a considerable impact on the natural vegetation caused by clearing of land for crops, dumping of refuse, burning of old houses and house floors and vitrification of burnt dung in cattle kraals. The samples of vitrified cattle dung from K2 sites that have been analysed by palynologist Louis Scott do not include mopane tree pollen. As the dung includes only grass pollen, this indicates that the ubiquitous mopane and all other trees had been cleared from some of the sites before the establishment of the settlement. This implies that by K2 times ivory hunting had been so successful that elephants were no longer a serious threat to large agricultural fields that were widespread on the flat lands between the hills where they could take advantage of the seasonal flooding of tributaries and the replenishment of silt. Even today, the middens and kraals are easily identifiable because little vegetation is established on them.

- Subsistence. All the middens at K2 show that the farming community established there was settled and successful. Burnt seeds of domesticated crops indicate that sorghum, beans and millet were grown nearby. The products were stored in small pole and daga grain bins (Eloff & Meyer 1981). Analysis of nearly 50 000 bone fragments (Voigt 1983) showed a pattern similar to Schroda with 3 dogs, 226 cattle and 290 sheep/goats, together with the remains of 45 species of wild animals, mostly caught in snares, as well as birds and a few fish.
- Pottery. The sophisticated K2 Vessel Series described by Meyer (1998; see also Schofield 1937; Gardner 1963) consists of spherical pots with short necks and mostly incised decoration motifs; hemi-spherical open bowls; spherical bowls with restricted openings, often combined with spouts; deep beaker-shaped bowls with incised decoration and beakers with incised decoration.
- Clay figurines. Baked clay figurines were recovered from the K2 midden, including whistles. Most common are elongated human figurines with stumpy heads, arms and legs, and cattle, sheep and goats (Meyer 1998).

- Metal. Small quantities of iron and copper ore and slag show that metal working took place nearby. The metal workers would have had to travel far to obtain the ore and probably brought in partly processed copper ingots and iron as there is no evidence there for smelting. Iron, associated with men, was traditionally worked outside settlements, whereas copper was associated with women and was worked inside settlements, with smithing done in the centre. Artefacts include arrowheads, spearheads, hoe blades, beads, bangles and wire (Meyer 1998; Calabrese 2000).
- Shell. Cowrie shells from the east coast were found, in addition to beads made of ostrich eggshell, snail and freshwater mussel shell.
- Bone and ivory artefacts. Bone needles and awls (Photo 25) and a large number of ivory bangles and armbands (Photo 24) as well as the debris from ivory working are further evidence of items made for trade.
- Burials. The 94 human skeletons, of which 76 were juveniles, came from graves among the houses next to the central cattle kraal at K2 and from the midden which later covered it. Isolated human remains outside of formal graves were also recovered within the midden, as were so-called beast burials in which cattle bones were ritually buried in pots. K2 burials were sometimes associated with large quantities of beads and other grave goods. Some of the burials at K2 date to the later Mapungubwe period indicating that the midden was still used as a burial ground after the K2 settlement was abandoned. Twentieth century ethnography gives some insight into the burial tradition. In most cases people were buried beneath their houses. However, it was necessary to 'cool' certain individuals who had died 'hot' deaths, in which case the grave was placed in the ash of a midden because ash was regarded as 'cool'. This was done most often for children (Huffman 1986a, b).
- Glass beads. Over 6500 glass beads have been recovered from deposits dating to the main occupation of the settlement and midden at K2 (Wood 2000) confirming that trade with the east coast had increased substantially. Horton (1996:329) has estimated that there was a mass introduction of glass beads on the east coast dating from c. AD 1050. The K2 beads would fall within this time period. The most characteristic of the beads from the K2 period are small transparent to translucent drawn glass beads that range from turquoise to blue-green and green-blue in colour. They are related in colour and opacity, but not in size, to larger beads that are found in a number of sites on the East African coast. Wood (2000:87) concludes that these smaller beads, which are of unknown origin, were probably preferred by the people who lived at K2 as they were more suitable for beadwork panels than the larger beads found on the coast. If this is the case, it gives a useful starting date in this part of the sub-continent for the practice of beadwork that continues to be a characteristic of Southern African craft today. Some of the drawn beads are of Indo-Pacific origin and probably derived from south-eastern India (Wood 2000), demonstrating the geographical range of the trade network of the time.
- Garden Rollers. Of special interest amongst the beads from K2 are the so-called Garden Rollers (Photo 32). Nearly 300 were found at K2, representing the largest collection in the region. They are usually barrel-shaped and turquoise to blue-green in colour and have been found in association with broken, finely-made pottery moulds. Davison (1973) demonstrated that the chemical composition of the Garden Rollers and the small imported beads is the same. They were therefore made on the site in individual moulds from glass melted down from the imported beads (Gardner 1963; Wood 2000). The technology is not only unique to the Mapungubwe Cultural Landscape, but it is one of the earliest instances of glass reworking in Africa south of the Sahara. Garden Rollers were made at other K2 sites as well and were widely traded within the Shashe/Limpopo region. They have also been found in small quantities at sites in Botswana, Zimbabwe and Zambia (Wood 2000).

Moving of the cattle kraal away from the centre of the settlement at about AD 1100 reflects a deliberate shift in the principles governing the settlement layout of K2. As the kraal was not re-established next to the court at Mapungubwe, Huffman (2000:21) interprets this as indicating new restricted ownership of cattle and a change in the function of the court from a place for all men, to a place for commoners. This is therefore the first indication of a major change away from the Central Cattle Pattern that developed further when K2 was abandoned and Mapungubwe became the regional capital. Other K2 phase sites that have been excavated in the MCL are Den Staat, Pont Drift, Leokwe Hill and others on the farm Little Muck about 13 km west of Mapungubwe. Excavations at Leokwe Hill were conducted on the western hilltop (Area A) and on the north-eastern terrace (Area B). Calibrated radiocarbon dates for the hilltop site range from AD 1160 to 1215. For house posts from the terrace site the range is between AD 1180 to 1215, and for a midden on the terrace to between AD 1050 and 1150 (Vogel & Calabrese 2000).

The Leokwe-Zhizo pottery from the terrace site is not K2/Leopard's Kopje, but is derived from Zhizo (Vogel & Calabrese 2000). It is contemporary with the Zhizo-derived site of Toutswe in eastern Botswana, but is much later than the Zhizo phase itself. The pottery from the hilltop site belongs to the K2 phase. It has therefore been suggested that the people at Leokwe Hill represent some of the people who stayed behind when the Shona-speaking Leopard's Kopje people settled at K2 (Huffman 2000). It is possible that Leopard's Kopje/K2 elite inhabited the high status area on the hilltop with Zhizo commoners below, but it is also possible that the two sites were not occupied simultaneously. Calabrese (Vogel & Calabrese 2000) interprets it as reflecting a more complex regional sociopolitical system than a simple replacement of Zhizo with Leopard's Kopje and one that incorporated some Zhizo elements. A third scenario is that the Zhizo people who remained may have formed a reciprocal relationship with the new immigrants while still maintaining their cultural identity as expressed in their pottery. Huffman (pers. comm.) suggests they could have maintained this identity as healers and rainmakers. With an older link to the landscape than the immigrants had, they would have been ritually closer to the spirits that control rain and healing. Current research projects are aimed at trying to distinguish between rainmaking and residential debris at both rainmaking hills and commoner sites near Leokwe Hill and on Rhodes Drift.

### ***Phase 3: The Mapungubwe Period***

Apart from success in trade and agriculture, the substantial increase in population density between the K2 and Mapungubwe phases was a critical factor in the development of a class structure and of Mapungubwe as a capital and a site of sacred leadership. This is reflected in the number of sites in phase 3 compared with phase 1. There are 39 recorded Mapungubwe period sites thus far in and around the MCL, about 20 on the Zimbabwe side of the Limpopo and a further 5 in Botswana (Huffman, pers. comm.; Figure 6). There is a hierarchy amongst these sites (Huffman 2000:22) with five administrative levels within a radius of 100 km of Mapungubwe. At the upper end of the scale, Mapela Hill in Zimbabwe is a large elite settlement; at the next level there are hilltop settlements at Little Muck A and Mmamagwe in Botswana; and the lowest two levels are commoner settlements. These smaller settlements are located on open terraces and do not include hilltop components. As the separation of commoners and elite was not present there, the Central Cattle Pattern continued to prevail. The commoner sites are recognisable by the characteristic Mapungubwe pottery and a relatively narrow range of radiocarbon dates between about AD 1250 and 1300 (Huffman 2000). The significant features of the Mapungubwe culture are detailed below.

**Town planning.** The settlement, town, or metropolis at Mapungubwe, situated 2.5 km south-east of the Limpopo/Shashe confluence, is several times larger than Mapela Hill so was clearly the regional capital and controlled an area of about 30 000 sq km. This is comparable with the size of the Zulu Kingdom in the 19th century and as it pre-dates this kingdom by several centuries, Mapungubwe can be regarded as the first state in Southern Africa. In the 80 homesteads associated with Mapungubwe pottery that have been recorded within 40 km of Mapungubwe, it is estimated that there were about 9000 people paying

allegiance to the senior. This was a five-fold increase in population from the beginning of occupation at Schroda (Huffman 2000).

At the end of the period of occupation of K2, the commoner population moved to the southern terrace and to plateaus to the east of Mapungubwe Hill, about a kilometre to the north-east of K2. A smaller elite group occupied the hilltop. Together the terrace, plateaus and the hill cover an area of about 10 ha and it is estimated that between 3000 and 5000 people lived there (Huffman 1996:185). The southern terrace consists of up to 5 m of accumulated midden and occupation deposits, the result of considerable activity during the 60 or 70 years of occupation. The sandstone-capped hill has vertical cliffs around the summit, which is 30 m high and 300 m long. As inadequate records were kept before and during the excavations on Mapungubwe Hill in the 1930s, it is not possible to reconstruct the settlement with any accuracy. There are nevertheless some parallels with Venda and Shona settlements that enable a tentative interpretation of some of the key features to be made. Remains of a special building complex, probably a palace, have been found in the centre of the hilltop demarcated by an arc of prestige revetment walls. In front of it were several houses and stone gaming boards suggesting that this is where the king's male retinue of soldiers, praisers and musicians lived (Huffman 1996:182). This part of the royal complex was connected to the court on the southern terrace below by a steep and narrow rock passageway that used to have wooden steps set into holes in the rock. On the other side of the hill, away from the lower court, was a second passage-way that led to a cluster of houses at the top where the king was established by AD 1250. The only grindstone found on the hilltop was recovered here. As grindstones are used by women, this was possibly the entrance used by some royal wives or the king's ritual sister. The two passage-ways leading to different activity areas parallel the status and gender divisions of the hill at Great Zimbabwe, Khami and other similar sites (Huffman 1996:183). In the Central Cattle Pattern, the rain-making area where ritual rain pots are kept is traditionally upslope and behind the residence of the chief who is responsible for organising the rain-making ceremonies. On Mapungubwe Hill there is an area with large numbers of potsherds near a group of broken boulders on the highest point behind the palace and this was probably the place where rain-making rituals took place. Another access route probably served this ritual area. It is on the eastern end of the hill and goes past a few short walls that designate the 'eye' of the king (Huffman 1996:184). Although insufficient evidence remains to fully reconstruct the layout and structures on and below Mapungubwe Hill, recent ethnographies and oral histories have provided enough pointers to enable the tangible elements that remain to be 'read' and understood as a cultural landscape.

**Use and modification of Mapungubwe Hill.** The earliest use of Mapungubwe Hill by Iron Age people was during the Early Iron Age. Small quantities of Happy Rest pottery found on the hilltop suggest the hill was used for rain-making. At the base of the Hill K2 pottery and burnt house remains indicate that the site was initially occupied at the same time as K2 (AD 1000-1220), but the main occupation was during the Mapungubwe period between AD 1220 and 1290. Unlike similar hills in the vicinity, the top of Mapungubwe Hill has up to 2 m of midden and occupation deposits. The soil that makes up these deposits could not have accumulated naturally on the hilltop. The deposits have been greatly disturbed, initially by uncontrolled excavations in the 1930s that removed the graves and associated grave goods, and later by controlled excavations, and this has destroyed some of the evidence. However, it is clear that large quantities of soil must have been carried to the summit from the surrounding plain to provide clay for house walls and floors and soil for a solid foundation for houses and graves. Stone, apparently carried from the hill slopes, has been used for low free-standing walls and for terrace walling. There are no obvious source pits from which soil could have been dug, perhaps because it was taken over an extended period as the need arose and not all at one time. Occupation of the combined terrace and hilltop settlement dates from AD 1220 to 1300 (Meyer 1998; Vogel 2000). At the end of this period almost all Mapungubwe sites were abandoned as climatic conditions deteriorated and there was insufficient rainfall to sustain such a large population. Intensive agriculture that is scheduled according to predictable seasonal changes is a prerequisite for providing a sustainable food supply and research into the details of this scheduling is ongoing. The location of Great

Zimbabwe in an area of higher rainfall was critical for its success in becoming the next regional capital.

**Separation of elite from commoners.** Evolution of the spatial organisation from Central Cattle Pattern to Zimbabwe Pattern was first evident when the central cattle kraal at K2 was abandoned between AD 1060 and 1100 and the cattle were moved outside of the settlement. The layout of the settlement at Mapungubwe was in two distinct areas: the commoners on the Southern Terrace at the foot of the hill and the elite rulers on the hilltop. The cattle remained outside the settlement after the move to Mapungubwe as there is no cattle dung anywhere in the vicinity of the southern terrace and the hill. The reason is that in the Mapungubwe social hierarchy, the royals owned all the cattle. As the court on the southern terrace was a place for commoners, no cattle could be kept there. This was in contrast to the Central Cattle Pattern in which cattle bound men together in and around the central cattle kraal. By AD 1250 a palace area on the hilltop separated the leader from his family and followers and entrances to elite areas were demarcated with low stone walls (Fouché 1937; Gardner 1963; Huffman 2000).

This process of separation of the elite from the commoners was the result of accumulated wealth in an upper class of hereditary sacred leadership. The wealth was not only a direct result of greater productivity in cattle or agricultural products and a consequent rise in population, but of east coast trade that the K2 people had successfully exploited. Huffman (2000:25) suggests that so much wealth accumulated from the trade that the normal channels of distribution within the social hierarchy of the Central Cattle Pattern were inadequate and ruling families became an upper class.

**Pottery.** A gradual change in ceramic style occurred soon after the move to Mapungubwe as a result of evolutionary changes rather than replacement of one population by another. Mapungubwe pottery is therefore a later phase in the Leopard's Kopje Tradition. More complex designs, a better surface finish and new types replaced the old ones, possibly because they were now made by full-time specialist potters who emerged as part of the developing class structure. Of particular interest are finds on Mapungubwe Hill in the 1930s and at the main entrance on the southern terrace in 1991 of three sherds of Chinese Celadon from a small, spherical vessel typical of a type made in China during the Sung Dynasty between AD 960 and 1279 (Meyer 1998:203).

**Ceramic figurines and spindle whorls.** Baked clay figurines similar to those from K2 were also found at Mapungubwe, but in smaller numbers. They included cattle, stylised human figures, a giraffe and conical shapes with decorated bases. From about AD 1250, ceramic spindle whorls were made at Mapungubwe. They are strong evidence that cotton yarn was spun here, and may have been woven here too (Huffman 2000:11). The cotton plants *Gossypium herbaceum* and *Gossypium arboreum* and the technique of spinning were possibly introduced from India or Asia along with other trade items (Davison & Harries 1980). They were probably grown semi-wild behind homesteads as is done in rural communities today. Cotton clothing would have been an additional status symbol amongst the elite at Mapungubwe.

**Glass beads.** If ever there was any doubt about the elite nature of the occupation of Mapungubwe Hill in comparison with the southern terrace, it would be dispelled by the enormous quantity of glass beads found on the hilltop, particularly associated with graves. More than 104 000 beads are in the collection from the hill, compared with less than 4 000 from the southern terrace (Wood 2000). In one hilltop grave (No. 14), the distribution and quantity of beads led Fouché (1937) to suggest that the body had been wearing bead garments or girdles. He also noted a cylindrical pile of beads 300 x 200 mm as though a bag of beads had been placed in the grave with the body. Just over 26 000 beads came from this burial, of which nearly 25 000 are black (Saitowitz 1996; Wood 2000). The difference in the quantity of glass beads from the hilltop and southern terrace may also be due to the placement of the excavations, however, as it is clear that commoners could have beads as well. The beads from Mapungubwe include a new series of small, uniform glass

oblates of unknown origin and several large and decorated beads that may have originated in Egypt or some other Middle Eastern Islamic centre (Wood 2000).

**Gold.** The finds from Mapungubwe that have caught the most public attention are the gold and gold objects recovered from graves during uncontrolled and poorly documented excavations on the hilltop between 1933 and 1935 (Meyer 1998; Photo 36). Although they are the oldest dated indigenous gold objects in Southern Africa, the gold trade in this region had been reported on the Sofalan coast of Mozambique as early as the 10th century and into the mid-12th century (Huffman 1998; Miller et al. 2000). The source of the gold was probably alluvial gold nuggets and gold extracted from crushed quartz from numerous gold-belts in surface quartz reefs in Zimbabwe. Some of these sources are along the Shashe River.

The gold at Mapungubwe was found in the form of foil, wire, bangles, strips, beads, coiled helix and pins, as well as a few globules and small discs. The foil was made by hammering globules into thin sheets on a stone anvil. It was then folded and smoothed and engraved over carved wooden forms such as the famous rhinoceros. Other foil-covered carvings found (all minus the original carved wooden core) included parts of two other rhinos, part of what may be a crocodile head, a mace and a bowl. The foil was fixed into position with gold tacks and some of these were also recovered (Fouche 1937; Meyer 1998). The goldsmiths at Mapungubwe were skilled in their craft, although there was no evidence at the site for working the metal beyond melting and hammering. The symbolic significance of the golden rhinoceros is intriguing, but only tantalisingly oblique oral traditions are of assistance. Meyer 1998:21). In Shona ethnography the black rhino, *Diceros bicornis*, is highly respected for its solitary lifestyle and fierce and aggressive behaviour. As these characteristics were admired in Zimbabwe rulers, the rhino is likely to have been a symbol of leadership (Huffman 1996:188-190).

**Iron and copper working.** A few iron items were found at Mapungubwe, but most of the metal artefacts were made of copper and all the slag is copper. The artefacts included rods, arrowheads, spear blades, hoes, chisels, rings, an awl, spikes and coiled or wound bangles. The excavations at Mapungubwe yielded ten times the number of iron and copper artefacts than were recovered from K2 and a hundred times more than were found at any other site, such as Leokwe Hill. Remains of tuyeres were noted on Mapungubwe Hill by the early excavators and copper slag was also found (Fouché 1937; Gardner 1963), but they are more likely to have been associated with secondary forging than with primary smelting.

There is a discrepancy between the large number of metal items found at Schroda, K2 and Mapungubwe, and their rare occurrence at commoner sites of similar age. It is apparent that people of low status had restricted access to finished, non-utilitarian metal artefacts because there was a strong association between metallurgy, fertility and leadership. Non-utilitarian metal artefacts were therefore highly potent symbols which may have signified nearness to leaders and thus to the sources of fertility and power (Calabrese 2000:110).

**Graves.** A total of 27 graves are reported to have been excavated on Mapungubwe Hill, but the remains and contents from only 12 are currently in the collection at the University of Pretoria Department of Anatomy (Steyn & Nienaber 2000). Most of the gold items were found with three of these elite graves confirming the high status of the individuals during life and emphasising again the difference between the hilltop elite and the commoners who lived on the terraces below, and between Mapungubwe and earlier phases when elite graves were placed in the cattle byre.

Burial 14 was that of a woman who had been interred in a sitting position facing west, an indication of high status in the Central Cattle Pattern even today. There were at least a hundred gold bangles around her ankles and over twelve thousand gold beads in the grave. In Burial 10 was a middle-aged man, also in a sitting position facing west. The grave goods included a necklace of gold beads and cowrie shells and some carvings covered in gold foil. One of these resembles the head of a crocodile. The position of the third burial with gold objects was not recorded by the excavators. The man had been buried with a headrest and

three wooden carved objects covered with gold foil: the rhinoceros, the mace and the bowl (Huffman 1996:188). As noted above, the rhino is a symbol of leadership amongst some southern African communities and the association of the rhinoceros with an elite burial at Mapungubwe confirms that it had symbolic status even in the thirteenth century.

**Bone and ivory artefacts.** Included in the deposits on the hilltop and southern terrace were large numbers of polished bone arrow points and linkshafts, some of which were decorated, and ivory armbands, rings and rough bone spoons. Voigt (1981) suggests that because large numbers of the polished bone arrow points and linkshafts were found in one place, they may have been made for trade by specialist bone toolmakers. The presence both the arrowheads and linkshafts and of ivory armbands that were very likely used as wrist guards by archers, suggests that an elite guard may well have protected the king.

**Middens.** Very extensive middens and occupation deposits built up on the southern, eastern and northern terraces below Mapungubwe Hill. A witness section through about 5 m of deposits on the southern terrace has been preserved and a portion of the trench has been left open. Layers of house floors, some of them burnt, are interspersed with midden refuse.

Analysis of the animal bones from the southern terrace and Mapungubwe Hill (Voigt 1983) confirms the observations at K2 and Schroda that the bulk of the meat eaten came from adult cattle, sheep and goats rather than from hunted wild animals, and fish made a negligible contribution to the diet. Bones of two kinds of domesticated dogs were also found. In summary, there is abundant evidence from both Mapungubwe Hill and the southern terrace excavations to support the conclusion that between AD 1220 and 1290 powerful sacred leaders were established on top of the hill and were supported by a substantial commoner population below. This physical separation of classes in different parts of the landscape symbolised the social, religious and political hierarchy that developed when successful trade and agriculture made it economically feasible to sustain a large population. As the population grew, so did the manifestation of class distinction. Agriculture ceased to be sustainable when climatic change altered the rainfall regime after AD 1290 and people were forced to move away and consequently the power related to east coast trade shifted to Great Zimbabwe. Although there may be few monumental structures to demonstrate how the inhabitants of the Mapungubwe Cultural Landscape changed the landscape, much can be gleaned from sensitive readings of the archaeological and ethnographic records:

- There is clear symbolism evident in the choice of sites to reflect social status, such as the placement of the commoner court at the base of the hill, the leader's entourage on the sides of the hill and the king and elite class on the top of the hill;
- There is evidence of manipulation of natural features to reflect ritual practices, such as the routes up Mapungubwe hill and the accumulation of occupation deposits there;
- The unprecedented wealth of the sacred leader at Mapungubwe is more than evident in the placement of elite graves and the quality of grave goods;
- The farming practices and huge middens that resulted from sustained use of the landscape have changed the original contours of the land; and the vegetation changed because of human activity so that middens and kraal sites with vitrified dung remain largely bare of plant cover.

### **Form and date of most recent records of property**

The most recent records of the site are summarised as follows:

### **Research publications**

- a. Summaries of research projects in the Limpopo Valley, edited by Mary Leslie and Tim Maggs, have been published in the South African Archaeological Society Goodwin Series, Vol. 8. December 2000, entitled African Naissance: the Limpopo Valley 1000 years ago.
- b. A book on The Archaeological sites of Greefswald: Stratigraphy and chronology of the sites and a history of investigations has been published by Meyer (1998).
- c. An illustrated publication intended for the general public summarising the results of the University of Pretoria excavations on Greefswald was published by Meyer (1996).
- d. A comprehensive report on The Rock Art of the Limpopo-Shashe Confluence Area has been prepared for the World Heritage nomination dossier by Eastwood (2001)
- e. The relationship between the Limpopo Valley sites and those in Zimbabwe is described in the book Snakes and Crocodiles: power and symbolism in ancient Zimbabwe by Huffman (1996).

### **Unpublished Reports, Surveys and Pamphlets**

- a. An initial scoping of the tourism potential of the Mapungubwe area was undertaken for the Mapungubwe Tourism Development Initiative (Norton et al. 2000). This included extensive community consultation.
- b. Between 1995 and 1998, Archaeological Resources Management at the University of the Witwatersrand undertook a review for De Beers Consolidated Mines Ltd of the archaeology of precolonial farming societies in the Shashe-Limpopo Basin (Huffman 1999).
- c. A programme to catalogue the Mapungubwe archive and collections at the University of Pretoria was begun in the mid-1990s. In 1997, the artefacts from the so-called gold burials on top of Mapungubwe Hill were declared a national cultural treasure and a full inventory with photographs of all the items was compiled by Professor Meyer.
- d. In 1999, the University of Pretoria placed many of the objects on permanent display in their SASOL African Heritage Exhibition. An illustrated pamphlet was published. As part of this initiative, conservation work was undertaken on the gold objects by a professional conservator at the British Museum.
- e. In 2000, some of the gold objects were loaned for an exhibition entitled Musuku: Golden Links with our Past at the South African National Gallery in Cape Town, sponsored by AngloGold. A colour catalogue was produced for the exhibition.
- f. A catalogue and analysis of the baked clay figurines from Schroda has been undertaken by Edwin Hanisch of the University of Venda and Dr J van Schalkwyk of the African Window Museum in Pretoria and is nearing completion. It will be published with illustrations when the collection is put on display at the museum in March 2002.
- g. SANParks have compiled a Draft Management Plan for the Vhembe Dongola National Park (Maphasa 2001).
- h. The Peace Parks Foundation has prepared a report on the Current status of the properties in the proposed 'core area' of the Limpopo / Shashe Transfrontier Conservation Area (Coetzee 2001).
- i. Professor V. Ralushai undertook an oral history project in the Mapungubwe Cultural Landscape and surrounding area to establish the nature and extent of cultural and genealogical links between present-day communities and the Mapungubwe period (Ralushai 2001).

### **Present state of conservation**

Two sites within the MCL were declared national monuments under the National Monuments Act (Act No. 28 of 1969). The site known as K2 was declared on 9 September 1983 in Government Gazette Notice No. 1936, and Mapungubwe Hill and the adjacent southern terrace was declared on 17 August 1984 in Government Gazette Notice No. 1756. In terms of the same legislation, the collection of cultural artefacts associated with the settlements at Mapungubwe and K2 was declared a National Cultural Treasure on 10 October 1997 in

Government Gazette Notice No. 1306. On 1 April 2000, the National Monuments Act was replaced by the National Heritage Resources Act (Act No. 25 of 1999). All previously declared national monuments automatically became provincial heritage sites. Provincial heritage resources authorities must do an audit of heritage sites and recommend to the S A Heritage Resources Agency (SAHRA) which of these is of national significance. This process is underway in the Northern Province and it will be recommended to the SAHRA Council that the entire core area of the Mapungubwe Cultural Landscape – in effect the Vhembe-Dongola National Park - be declared a national heritage site. In terms of the National Heritage Resources Act, all national heritage sites must have a management plan. A management plan is also a requirement for all sites nominated for world heritage status in terms of the South African World Heritage Convention Act. This management plan is being drafted for comment.

With the exception of farms that are not yet part of the contractual park, all cultural resources within the Vhembe-Dongola National Park that form the largest part of the core area of the Mapungubwe Cultural Landscape, are managed by SANParks. Principles for a draft management plan were drawn up and circulated for comment in mid-2001.

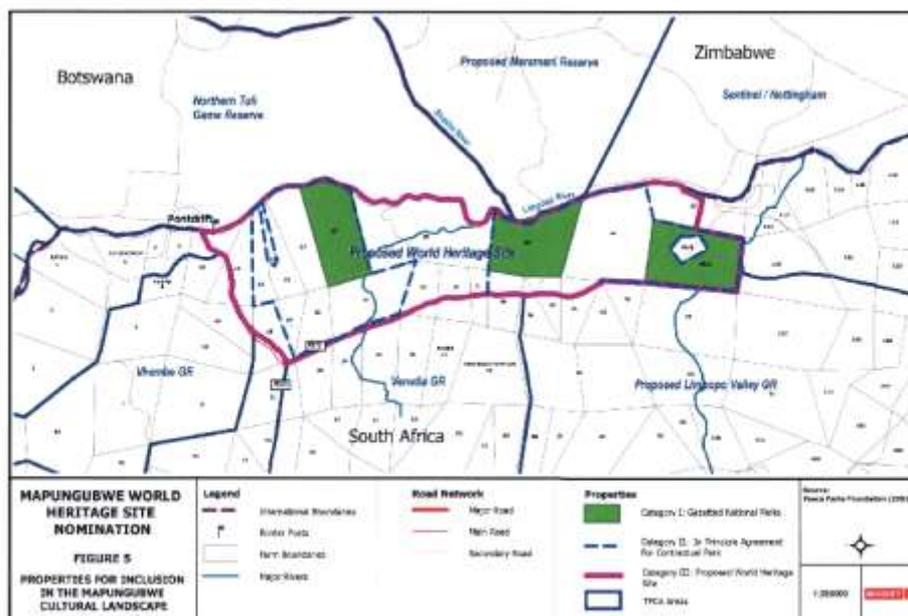


Figure 7. Buffer zone

The purple line in the above map shows the extent of the Mapungubwe WHS.

### Previous Heritage Studies

The following heritage management studies were located on the SAHRIS website;

- Gaigher, S. 2009, Heritage Impact Assessment for a prospecting application - Alldays Limpopo Province. G&A Heritage
- Gaigher, S. 2011, A PHASE I ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) STUDY FOR DE BEERS CONSOLIDATED MINES (VENETIA MINE) IN THE LIMPOPO PROVINCE. G&A Heritage
- Gaigher, S. 2012. Heritage Impact Assessment - Proposed establishment of the Krone-Endora Diamond Mine on a Portion of the farm Krone as well as a Portion of the Farm Endora 66MS adjacent to Venetia Mine near Alldays, Limpopo Province. G&A Heritage.
- Huffman, T.N. 2003. Archaeological Assessment of Tourist Developments in the Mapungubwe Cultural Landscape.

- Bonner, P. 2003. Mapungubwe Cultural Heritage Resources Survey: The Recent History of the Mapungubwe Area.
- Nienaber, W.C. 2003. Mapungubwe Rehabilitation Project: Progress Report
- Meyer, A. 2004. A Report on the Stabilization of an Erosion Gully on Mapungubwe Hill: Greefswald 37 MS.

An extensive survey for archaeological sites on the farms Venetia 103MS, Rugen 105MS and Krone 104MS was undertaken by Mr. E.O.M. Hanisch of the University of Venda during 1989. The pipeline route between the Venetia Mine and the well fields on Schroda 46MS and Greefswald 37MS was also inspected and during the course of its excavation was periodically checked to see if any archaeological finds were unearthed.

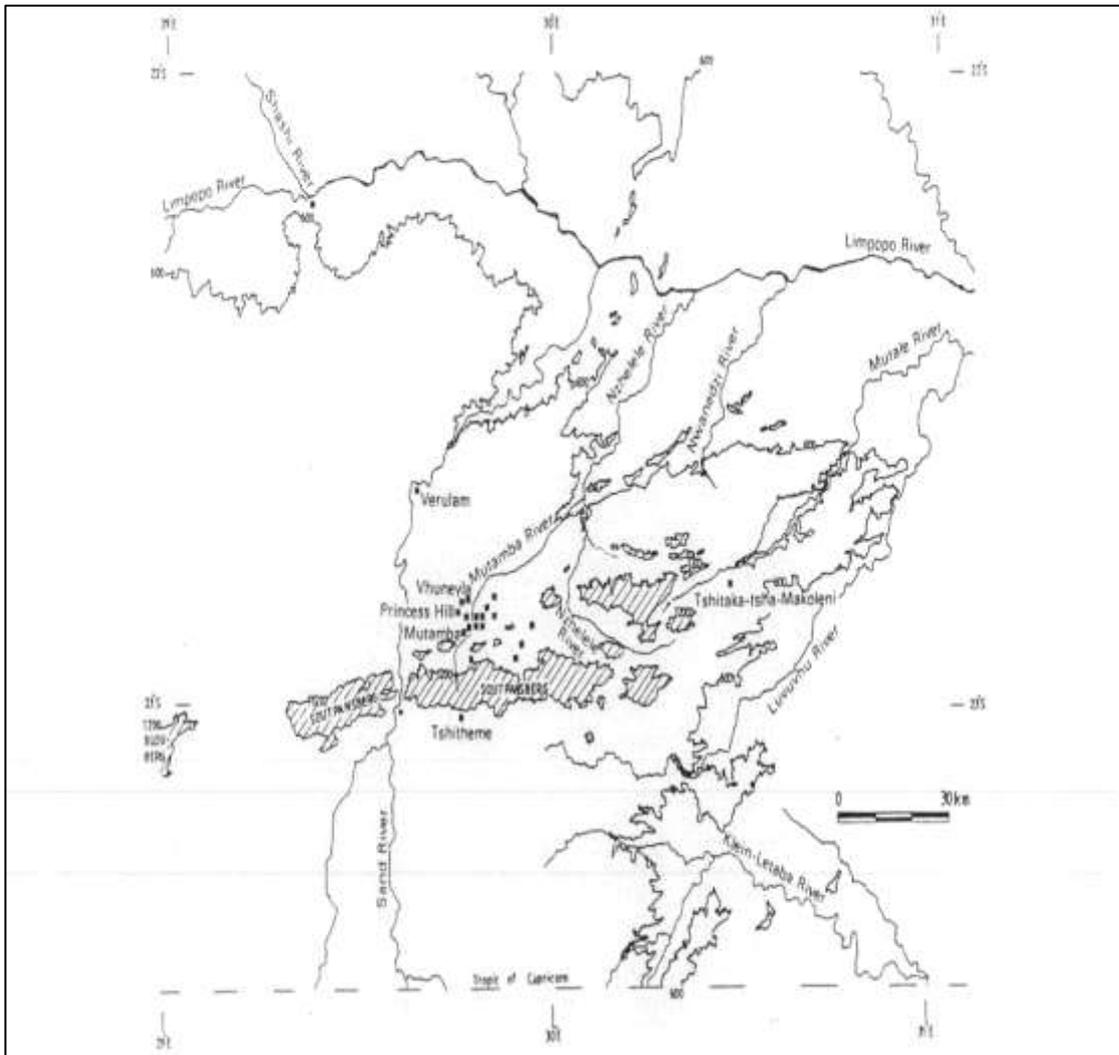


Figure 8. Distribution of Mapungubwe Pottery from Loubser 1988

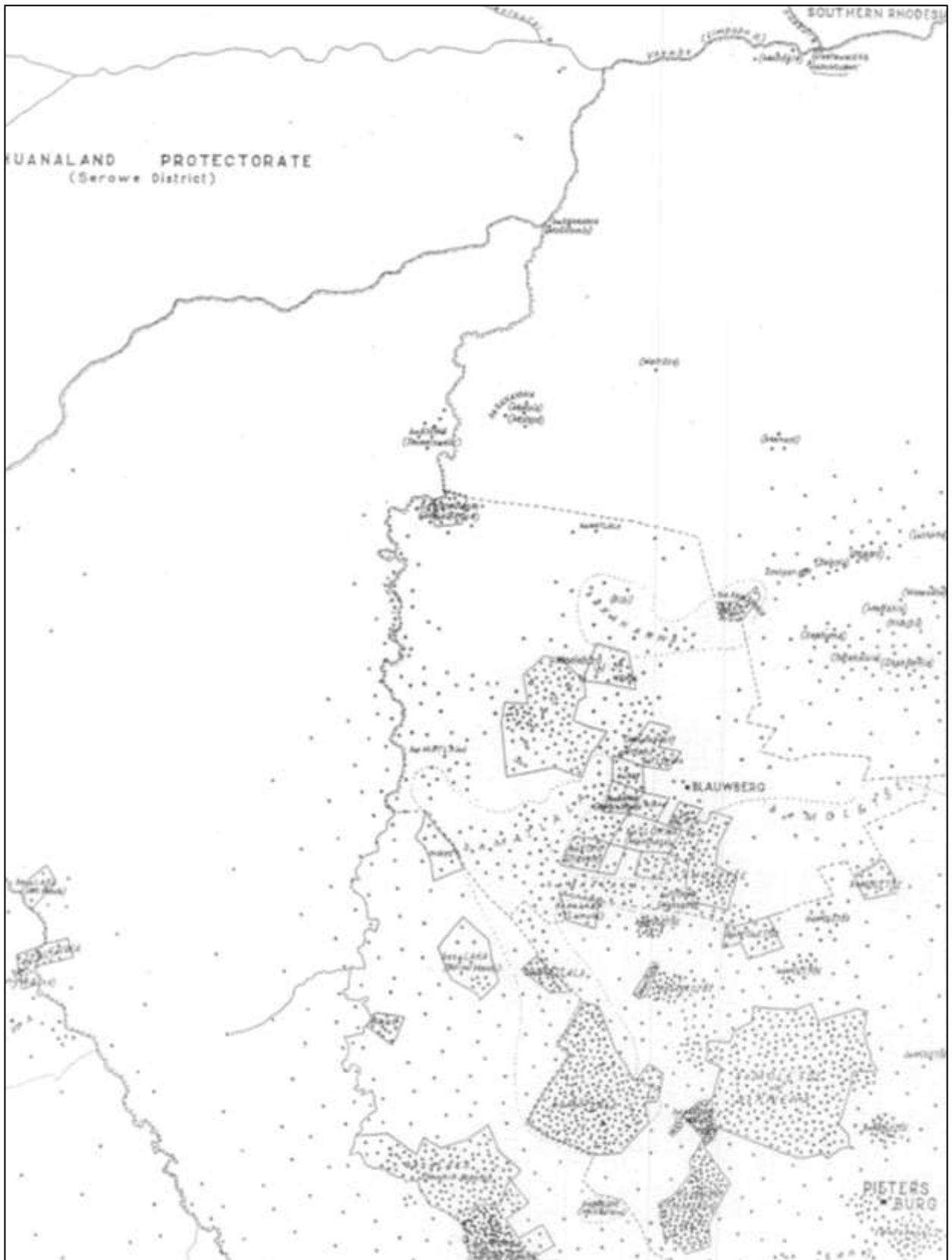


Figure 9. Distribution of African People in North West Transvaal from Van Warmelo 1935



Figure 10. Distribution of pre-Difiquane Chiefdom (from Parsons 1945)

## The Mapungubwe Cultural Landscape Buffer

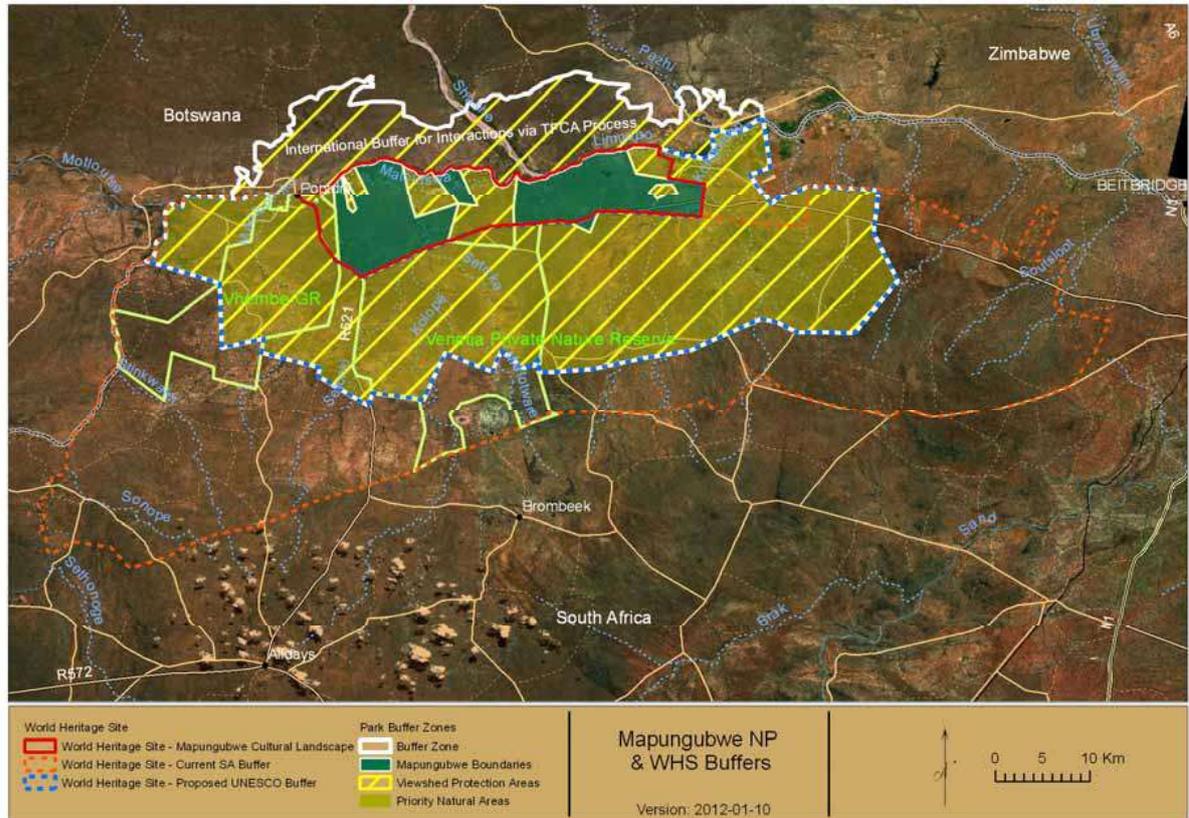


Figure 11. Mapungubwe Buffer

The Mapungubwe Conservation Area includes the areas under the administration of the Venetia Mine and especially its nature reserve. Much of the areas now included in the Mapungubwe National Park were once under the management and protection of the Venetia Conservation Society and are in fact still owned by the DeBeers group. These areas are being managed as natural areas around the central mining area of the Venetia mine itself. In itself it serves as a buffer zone for the industrial activities at the mine and the recently formed Mapungubwe National Park.

"A buffer zone serves to provide an additional layer of protection to a World Heritage property. The concept of a buffer zone was first included in the Operational Guidelines for the implementation of the World Heritage Convention in 1977. In the most current version of the Operational Guidelines of 2005 the inclusion of a buffer zone into a nomination of a site to the World Heritage List is strongly recommended but not mandatory." (<http://whc.unesco.org/en/events/473>).

The red line in Fig 6 shows the extent of the Mapungubwe WHS.

The activities described in this report is concentrated and limited to areas outside of the proposed buffer zone of the Mapungubwe World Heritage Site. This means that the boundaries of the Mapungubwe Cultural Node (as defined in the World Heritage Site application) are around 30km away from the proposed activity. Secondary impacts such as visual, dust and noise impacts will be mitigated in part by the Environmental Management Plan Report but also in a large part by the distance from these sites of the proposed activities.

"Many World Heritage properties face problems that directly or indirectly derive from the situation of their buffer zone. New constructions within a buffer zone may have an impact on the World Heritage property and could threaten its Outstanding Universal Value; a different legal status of a buffer zone could also impact the conservation, the protection or management plan of a site." (<http://whc.unesco.org/en/events/473>)

### **The Origins of Mapungubwe Project (WITS Phase)**

Since the 1990s, Wits archaeologists have worked in the Mapungubwe landscape investigating Stone Age, Rock Art and Iron Age sites. They concentrated on the last 2000 years. The systematic survey of the National Park and buffer zone, including Little Muck, Schroda and Venetia, has now recorded some 1000 Iron Age sites. Using this data, various graduate students have investigated ethnic stratification (Calabrese PhD 2005), glass beads and international trade (Wood MA 2005), the ethno-archaeology (Murimbika PhD 2006) and archaeology (Schoeman PhD 2006) of rainmaking, the relationship of settlements to the landscape (du Piesanie MSc 2008), faunal remains (Fatherley MSc 2009), agricultural production (Chandler Honours 2009) and spherulites in cattle dung. Current research includes settlements during the Khami Period (du Piesanie PhD) and herding strategies.

Although the survey has not included either the Krone or Endora properties, they have been investigating neighboring properties and the results of site location patterns were useful in this study.

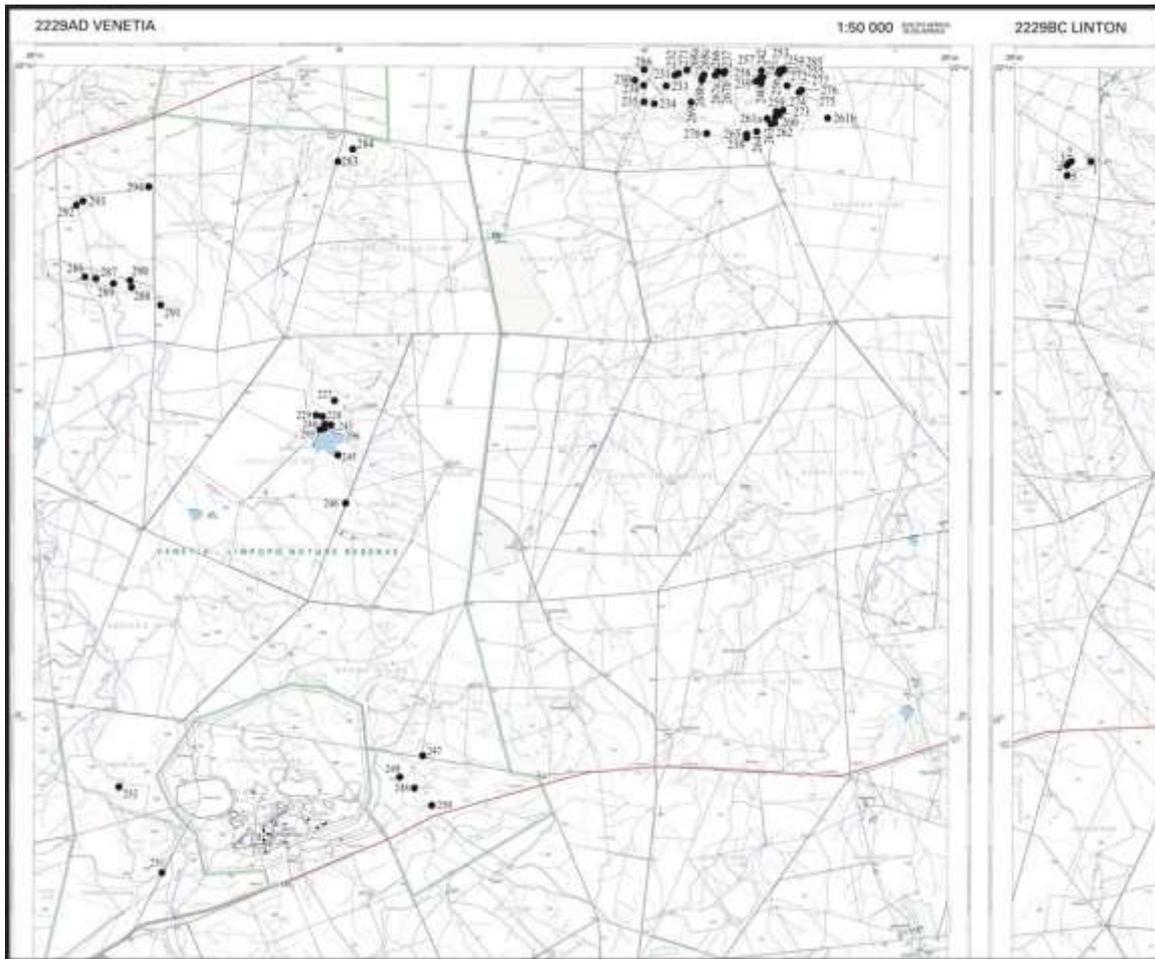


Figure 12. Results of the 2008 season

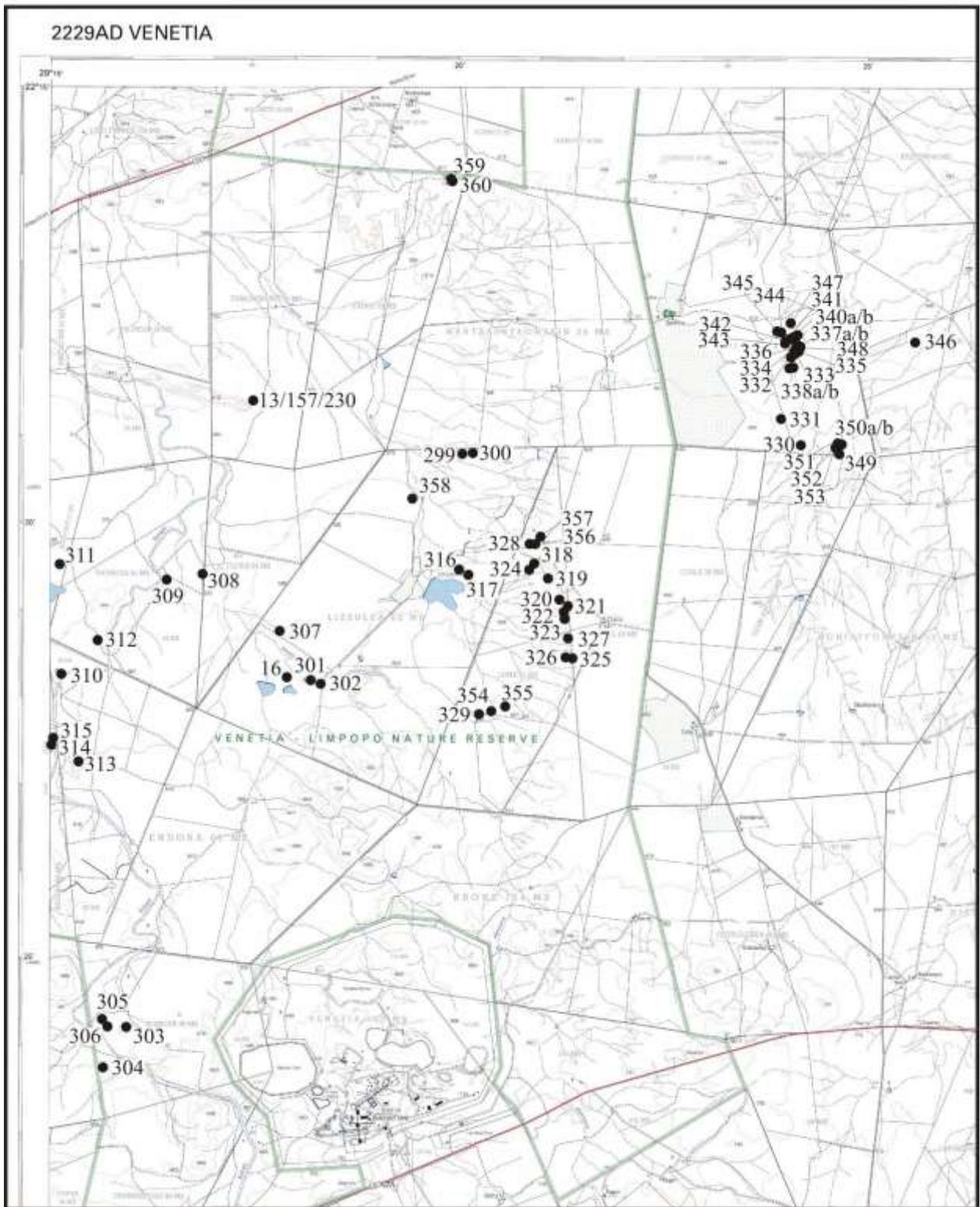


Figure 13. Results of the 2009 - 2010 season

It is significant to note that documented sites were clustered along riverbeds or other sources of water or around elevated areas.

# Impacts Anticipated

In 2003 the SAHRA compiled the following guidelines to evaluate the cultural significance of individual heritage resources:

## TYPE OF RESOURCE

- Place
- Archaeological Site
- Structure
- Grave
- Paleontological Feature
- Geological Feature

## TYPE OF SIGNIFICANCE

### 1. HISTORIC VALUE

It is important in the community, or pattern of history

- o Important in the evolution of cultural landscapes and settlement patterns
- o Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.
- o Important for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, province, region or community.
- o Important as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period.

It has strong or special association with the life or work of a person, group or organisation of importance in history

- o Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, province, region or community.

It has significance relating to the history of slavery

- o Importance for a direct link to the history of slavery in South Africa.

### 2. AESTHETIC VALUE

It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

- o Important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
- o Importance for its creative, design or artistic excellence, innovation or achievement.
- o Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
- o In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.

### 3. SCIENTIFIC VALUE

It has potential to yield information that will contribute to an understanding of natural or cultural heritage

- o Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.

- Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
- Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
- It is important in demonstrating a high degree of creative or technical achievement at a particular period
- Importance for its technical innovation or achievement.

4. SOCIAL VALUE

- It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
- Importance in contributing to a community’s sense of place.

**DEGREES OF SIGNIFICANCE**

1. RARITY

It possesses uncommon, rare or endangered aspects of natural or cultural heritage.

- Importance for rare, endangered or uncommon structures, landscapes or phenomena.

2. REPRESENTIVITY

- It is important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects.
- Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class.
- Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.

The table below illustrates how a site’s heritage significance is determined

Spheres of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific Community			

What other similar sites may be compared to this site?

**Impact Statement**

**Assessment of Impacts**

**Heritage Environments that will be affected**

Archaeological Sites - Pre-Contact Heritage (Stone Age Sites)

Proposed 90/100 MW site and associated infrastructure (roads and power lines)

*Nature of Impacts:* All the proposed development activities could negatively affect sites associated with the Stone Age.

*Extent of Impacts:* Localised damage to the sites (see *Impact Statement* section for application).

Nature of Impact: Possible post-contact site could be damaged locally by excavation activities and associated activities		
	Without Mitigation	With Mitigation
Extent	<b>Local (2)</b>	<b>Local (2)</b>
Duration	<b>Long term (5)</b>	<b>Long term (5)</b>
Magnitude	<b>Medium (4)</b>	<b>Low (1)</b>
Probability	<b>Probable (3)</b>	<b>Improbable (1)</b>
Significance	<b>Medium (33)</b>	<b>Low (8)</b>
Status	<b>Negative</b>	<b>Positive</b>
Reversibility	<b>Irreversible</b>	<b>Irreversible</b>
Irreplaceable loss of resource	<b>Yes</b>	<b>No</b>
Can impacts be mitigated	<b>No</b>	<b>Yes</b>
Mitigation	<b>Excavation activities should be monitored by a qualified heritage practitioner</b>	
Cumulative impacts	<b>None</b>	
Residual impacts	<b>Loss of heritage related information</b>	

### **Paleontological sites**

*Nature of Impacts:* No paleontological sites of high value could be identified. Paleontological sites could be affected if bedrock was to be disturbed during the excavation activities associated with the construction of the pylon foundations. It was however determined that the ground intrusion of the development would be limited and that base rock would not be affected. A paleontological study for this general area was commissioned, however and can be made available should it be found necessary.

*Extent of Impact:* Localised damage to possible paleontological sites where bedrock is close to the surface or exposed.

Nature of Impact: Paleontological sites could be affected if bedrock was to be disturbed during the excavation activities associated with the construction.		
	Without Mitigation	With Mitigation
Extent	<b>Local (2)</b>	<b>Local (2)</b>
Duration	<b>Short term (2)</b>	<b>Long term (5)</b>
Magnitude	<b>Low (2)</b>	<b>Low (1)</b>
Probability	<b>Improbable (2)</b>	<b>Improbable (1)</b>
Significance	<b>Low (12)</b>	<b>Low (8)</b>
Status	<b>Negative</b>	<b>Positive</b>
Reversibility	<b>Irreversible</b>	<b>Reversible</b>
Irreplaceable loss of resource	<b>Yes</b>	<b>No</b>
Can impacts be mitigated	<b>No</b>	<b>Yes</b>
Mitigation	<b>No further mitigation is recommended provided bedrock is not to be disturbed</b>	
Cumulative impacts	<b>None</b>	
Residual impacts	<b>None</b>	

### **Mitigation**

Paleontological monitoring during excavation activities if bedrock is to be disturbed.

### Built Environment

Although some built structures were noted, none will be affected by the proposed development.

*Nature of Impacts:* No built environment sites were located within the study area.

*Extent of Impact:* No damage is anticipated as no sites were identified.

Nature of Impact: No sites falling within the Built Environment were identified within the study.		
	Without Mitigation	With Mitigation
Extent	<b>Local (1)</b>	<b>Local (1)</b>
Duration	<b>Short term (1)</b>	<b>Long term (1)</b>
Magnitude	<b>Low (1)</b>	<b>Low (1)</b>
Probability	<b>Improbable (1)</b>	<b>Improbable (1)</b>
Significance	<b>Low (3)</b>	<b>Low (3)</b>
Status	<b>Positive</b>	<b>Positive</b>
Reversibility	<b>Reversible</b>	<b>Reversible</b>
Irreplaceable loss of resource	<b>No</b>	<b>No</b>
Can impacts be mitigated	<b>Yes</b>	<b>Yes</b>
Mitigation	<b>No further mitigation is recommended</b>	
Cumulative impacts	<b>None</b>	
Residual impacts	<b>None</b>	

### Mitigation

No sites were identified and therefore no mitigation is recommended.

### Cultural Landscape

Several possible cultural landscape components were identified especially associated with the Mapungubwe WHS Cultural Landscape.

*Nature of Impacts:* The construction of the PV/CPV Site could result in alterations to the cultural characteristics of the landscape.

*Extent of Impact:* Limited impacts on the cultural landscape are anticipated.

Nature of Impact: Limited impacts on the cultural landscape are anticipated.		
	Without Mitigation	With Mitigation
Extent	<b>Local (2)</b>	<b>Local (2)</b>
Duration	<b>Short term (2)</b>	<b>Long term (2)</b>
Magnitude	<b>Low (1)</b>	<b>Low (1)</b>
Probability	<b>Improbable (3)</b>	<b>Improbable (3)</b>
Significance	<b>Low (15)</b>	<b>Low (15)</b>
Status	<b>Positive</b>	<b>Positive</b>
Reversibility	<b>Reversible</b>	<b>Reversible</b>
Irreplaceable loss of resource	<b>No</b>	<b>No</b>
Can impacts be mitigated	<b>Yes</b>	<b>Yes</b>
Mitigation	<b>No further mitigation is recommended</b>	
Cumulative impacts	<b>None</b>	
Residual impacts	<b>None</b>	

## Mitigation

No further mitigation is recommended.

## Selection of alternatives

No alternatives were indicated.

## Heritage Management Planning

### Minimising the impact on Archaeological Sites (as per the NHRA)

Objective 1: Minimising the impact on archaeological sites

The construction of the PV/CPV array could impact on unidentified sites of archaeological importance.

Project Component	PV/CPV Array, power lines, roads and construction camps
Potential Impact	Destruction of sub-surface archaeological sites
Activity/Risk source	Foundations, power lines and roads
Mitigation Target	Conserve archaeological sites

Mitigation: Action	Responsibility	Time Frame
Monitoring of any excavation activities during the construction phase of the project.	Contracting of a qualified heritage practitioner to monitor excavations	During excavations associated with the construction phase

Performance Indicator	No destruction of archaeological sites
Monitoring	Monitoring during excavation phase

### Minimising the impact on the cultural landscape (as per the NHRA)

Objective 1: Minimising the impact on the cultural landscape

The proposed site lies outside of the southern boundary of the buffer zone for the Mapungubwe WHS and Cultural Landscape. The possible impact on this landscape type should be avoided.

Project Component	PV/CPV Array, power lines, roads and construction camps
Potential Impact	Negative impacts on the cultural landscape
Activity/Risk source	PV/CPV Array, power lines and roads
Mitigation Target	Preservation of cultural landscape components

Mitigation: Action	Responsibility	Time Frame
Mapungubwe WHS management should be informed of the development and any changes in the buffer zone should be re-evaluated.	Environmental Manager	Continuous

Performance Indicator	No impact on Mapungubwe WHS and Cultural Landscape
Monitoring	Throughout construction phase

### Minimising the impact on Unidentified Sites (as per the NHRA)

Objective 1: Minimising the impact on unidentified sites
Unidentified or sub-surface sites could still be encountered during the construction phase

Project Component	PV/CPV Array, power lines, roads and construction camps
Potential Impact	Destruction of unidentified sites
Activity/Risk source	Foundations, power lines and roads
Mitigation Target	Minimize impact on unidentified sites

Mitigation: Action	Responsibility	Time Frame
Monitoring of excavation activities during the construction phase of the project.	Contracted heritage practitioner	During construction phase

Performance Indicator	No destruction of archaeological sites
Monitoring	Monitoring during construction phase

### Minimising the impact on Burial and Grave Sites (as per the NHRA)

Objective 1: Minimising the impact on burial and grave sites
The placement of the PV/CPV Array and associated infrastructure could impact on unidentified burial or grave sites

Project Component	PV/CPV Array, power lines, roads and construction camps
Potential Impact	Destruction of grave and burial sites
Activity/Risk source	PV/CPV Array foundations, power lines and roads
Mitigation Target	Mitigate impacts on burial or grave sites

Mitigation: Action	Responsibility	Time Frame
On uncovering a possible grave or burial site it is imperative that construction be ceased immediately. The area should be marked and a heritage practitioner be informed immediately.	Environmental control officer	Immediately

Performance Indicator	Mitigation of burial and grave sites
Monitoring	No monitoring is required

## Discussion on Site Location and Mapungubwe CL

The study area is located on a slight rise to the south of the Venetia Mine. The area investigated showed several characteristics that would indicate a likely absence of heritage sites within. Several Iron Age and Stone Age sites have been identified in the surrounding areas. Most of these were identified through the Wits University regional survey. Analysis of the identified sites in this study indicated the following pre-requisites for sites;

- Iron Age sites were all found within 1km of a watercourse (many of these are now dried up, however could have been holding water earlier.
- The predominant amount of Stone Age sites was found close to sandstone or granite ridges or on dried-out pans.
- A regional survey performed by the author on proposed development areas for the Mapungubwe National Park also indicated that areas where calcrete deposits were dominant were never occupied. The reason for this is unclear however, it could

possibly be due to the significant increase in poisonous invertebrates within these areas (pers. observation).

- Watersheds in-between run-off areas were distinctly devoid of any occupational sites.
- Heritage sites were found to be clustered close to each other rather than evenly spread out over the study area.

The above information relates directly to the study area resulting in the postulation that it is not conducive to occupation. The site is located on a watershed ridge where no sites have been identified by any other study. There is a poorly defined drainage running from north to south in the eastern third of the study area. This was investigated thoroughly and no sites were found along it. The predominant base substrate is calcrete, which does not hold sites. No stony ridges are located on the study area. It is flat and featureless at the top of the watershed.

Historic investigations also show a distinct lack of occupation in the study area. The 1935 Van Warmelo map of tribal occupational areas showed no sites within a 30km radius from the study area. The 1988 Mapungubwe Pottery survey by Loubser also indicates a distinct lack of deposits within the study area.

## **Conclusion**

The Mapungubwe Cultural Landscape (MCL) can be seen to include the study area even though the official buffer zone excludes it. The MCL was defined based on the occurrence of high-value heritage sites within an exceptional natural backdrop. Although these sites are highly significant their distribution is governed by very specific requirements. These are discussed in the previous section and they are found to be distinctly absent in the study area. The importance of the MCL is based on the significance of sites located here and this however does not mean that these sites occur everywhere. It is possible to identify areas where no or minimal impacts will be experienced. The study area was found to be such a site. It is also necessary to compare the possible benefits of the proposed project to the negative impacts that that could result from it. The proposed project is a sustainable energy project that could potentially provide clean energy to the local consumers. Taken the much more dramatic impact of proposed coal mines closer to Mapungubwe it is important that such alternative energy projects be supported to refute the motivations behind the higher impact coal mining projects. Although it is unlikely that any finds will be made during the construction phase of the project, the MCL is of such significance that it is proposed that the construction activities are monitored to ensure that no sub-surface sites sustains damage.

It is not anticipated that the proposed development will detract from the MCL as it is located outside of the buffer zone and holds no sites of heritage significance. It will result in an alteration of the local landscape to a more industrial feel, however this has in large already happened with the development of the Venetia mine to the south. The visual impact of the proposed development will therefore be blocked from the northern perspective by the mining activities already underway.

The up to 100 MW site could be constructed in any part of the study area as no culturally sensitive sites were identified. The site lies on the southern boundary of the Mapungubwe WHS and Cultural Landscape, however no impact on this component is anticipated.

It is the opinion of the author that the social and environmental benefits of the proposed project far outweigh the perceived possible negative impacts on the MCL.

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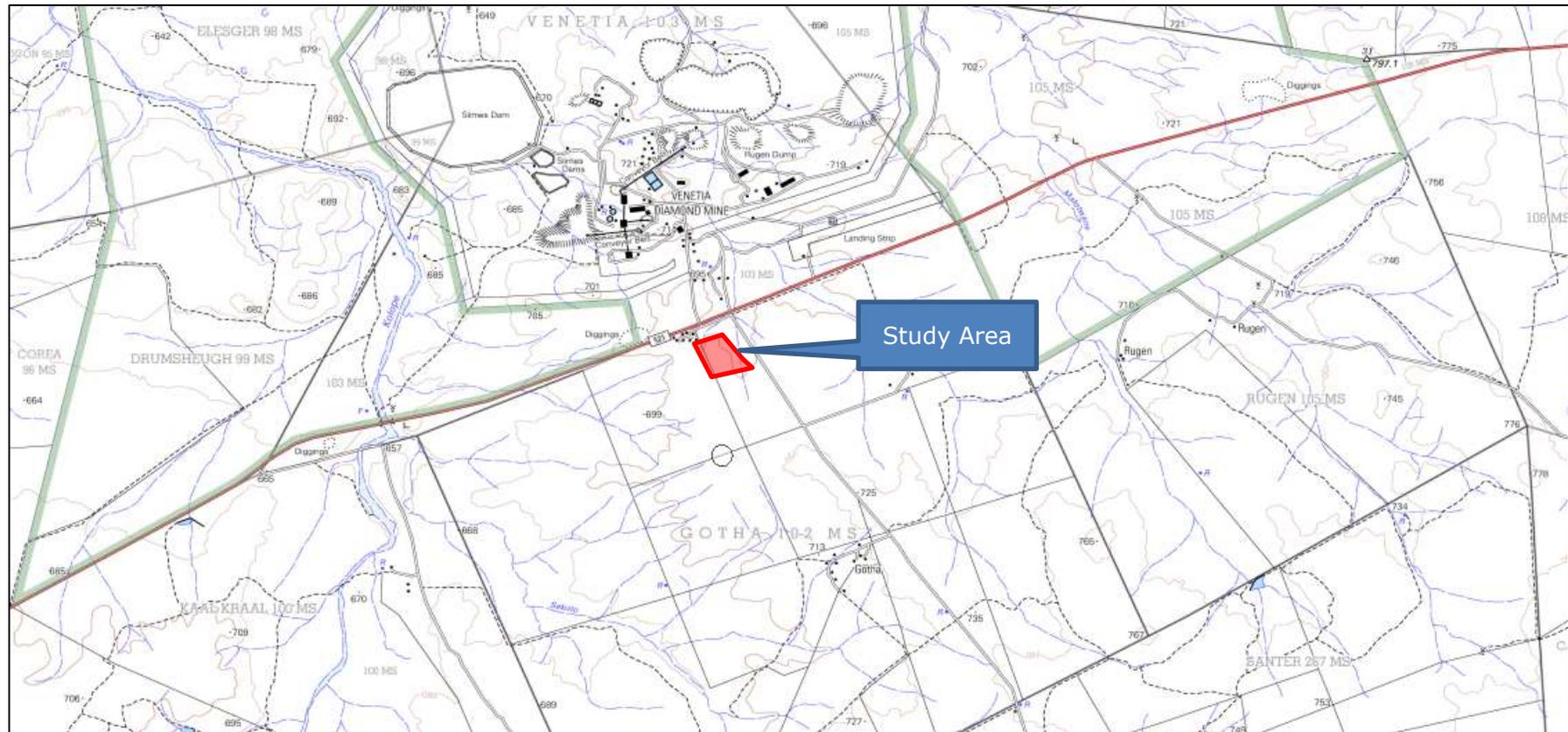
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## APPENDIX A

1:50 000 Map Location  
Map Reference 2229 DA



Venetia Photovoltaic EIA HIA