

HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999))

FOR THE VENETIA LIMPOPO NATURE RESERVE (VLNR) LODGE, LIMPOPO PROVINCE

Type of development:

Lodge

Client:

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Project Reference:

Report date:

November 2020

APPROVAL PAGE

Project Name	VLNR Lodge
Report Title	Heritage Impact Assessment for the proposed VLNR Lodge, Limpopo Province
Authority Reference Number	TBC
Report Status	Final
Applicant Name	De Beers Consolidated Mines

	Name	Qualifications and Certifications	Date
Archaeologist	Jaco van der Walt	MA Archaeology ASAPA #159	November 2020

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Date	Report Reference Number	Description of Amendment

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REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 0-1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	<i>Declaration of Independence</i>
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA) an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 10
(l) Conditions for inclusion in the environmental authorisation	Section 10
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to Environmental Assessment report
(q) Any other information requested by the competent authority	Section 11

Executive Summary


Alta van Dyk Environmental Consultants CC was appointed to conduct an Environmental Authorisation (EA) process for the proposed VLNR Lodge. The lodge is located on the farm Lizzulea 62 MS, Vhembe district, Limpopo Province. HCAC was appointed to conduct a Heritage Impact Assessment for the project and the study area was assessed on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover approximately 1.8 hectares where the lodge will be located. The exact location of the lodge and amenities was not available at the time of the survey and no alternatives were provided for assessment although the extent of the area assessed allows for siting of the development to minimise impacts to heritage resources. Key findings of the assessment include:

- The study area is indicated as very sensitive on the SAHRIS paleontological map and an independent study was conducted (Bamford 2020). During the field survey no body fossils were recorded, only isolated rock fragments with trace fossils;
- Iron Age/farming community sites dating to the Leokwe *facies* (1010 – 1160 AD) occur within but mostly adjacent to the study area;
- The existing access road was constructed through the Leokwe sites (Site 2229AD 208 & 2229AD 209);
- Stone Age artefacts (mostly Later Stone Age (LSA) and to a lesser extent Middle Stone Age (MSA) artefact are found to the north of the study area;
- The study area is located within the Mapungubwe World Heritage Site (WHS) buffer zone but will not negatively impact on the Outstanding Universal Value (OUV) of the site.

The impact of the project on heritage resources can be mitigated to an acceptable level and it is recommended that the proposed project is approved on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- It is recommended that the recorded sites Waypoint 172, 2229AD 295, Waypoint 174, 2229AD 296, Waypoint 176, 177, 178, 2229AD 208 and 2229AD 209 should be retained *in situ*.
- As the impact to the Leokwe sites (Site 2229AD 208 & 2229AD 209) has already occurred the continued use of the existing access road subject to a Section 35 permit as well as a management plan is recommended. There is no design report for the road but the intact deposit can be sealed by paving the area and including the management of stormwater and erosion in the site management plan;
- Recorded heritage resources should be indicated on development maps and infrastructure should be located well away from these areas.
- Implementation of a heritage site development plan for the project; and
- Implementation of a chance find procedure for the project (archaeology and palaeontology).

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I:</p> <ul style="list-style-type: none"> • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	09/11/2020

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 20 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia, Guinea and Tanzania. Through this, he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

TABLE OF CONTENTS

REPORT OUTLINE.....	4
EXECUTIVE SUMMARY	5
DECLARATION OF INDEPENDENCE.....	6
A) EXPERTISE OF THE SPECIALIST.....	6
ABBREVIATIONS.....	11
GLOSSARY.....	11
1 INTRODUCTION AND TERMS OF REFERENCE:.....	12
1.1 TERMS OF REFERENCE.....	12
1.2 PROJECT DESCRIPTION	13
1.3 ALTERNATIVES	13
2 LEGISLATIVE REQUIREMENTS.....	17
3 METHODOLOGY	18
3.1 LITERATURE REVIEW.....	18
3.2 GENEALOGICAL SOCIETY AND GOOGLE EARTH MONUMENTS.....	18
3.3 PUBLIC CONSULTATION AND STAKEHOLDER ENGAGEMENT:.....	18
3.4 SITE INVESTIGATION.....	19
3.5 SITE SIGNIFICANCE AND FIELD RATING.....	21
3.6 IMPACT ASSESSMENT METHODOLOGY.....	22
3.7 LIMITATIONS AND CONSTRAINTS OF THE STUDY	25
4 DESCRIPTION OF SOCIO ECONOMIC ENVIRONMENTAL	25
5 DESCRIPTION OF THE PHYSICAL ENVIRONMENT:	26
6 RESULTS OF PUBLIC CONSULTATION AND STAKEHOLDER ENGAGEMENT:	28
7 LITERATURE / BACKGROUND STUDY:	29
7.1 LITERATURE REVIEW (SAHRIS)	29
7.2 GENERAL HISTORY OF THE AREA	30
7.3 HISTORICAL INFORMATION.....	36
8 FINDINGS OF THE SURVEY.....	43
8.1 ARCHAEOLOGICAL FINDINGS	47
8.2 PALAEOLOGY	55
8.3 GRAVES AND BURIAL SITES	56
9 POTENTIAL IMPACT	56

9.1	IMPACT ASSESSMENT – WORLD HERITAGE SITE (ICOMOS)	58
9.2	IMPACT ASSESSMENT – DEPARTMENT OF ENVIRONMENTAL AFFAIRS.	60
10	CONCLUSION AND RECOMMENDATIONS	62
10.1.	CHANCE FIND PROCEDURES - HERITAGE RESOURCES.....	63
10.2.	REASONED OPINION	64
11	REFERENCES.....	65
12	APPENDICES:.....	67
	CURRICULUM VITAE OF SPECIALIST	67

LIST OF FIGURES

FIGURE 1-1. REGIONAL SETTING (1: 250 000 TOPOGRAPHICAL MAP).....	14
FIGURE 1-2: LOCAL SETTING (1:50 000 TOPOGRAPHICAL MAP).....	15
FIGURE 1-3. SATELLITE IMAGE OF THE STUDY AREA.	16
FIGURE 3-1: TRACK LOG OF THE SURVEY IN GREEN.	20
FIGURE 5-1. LANDSCAPE CONTEXT OF THE STUDY AREA.	26
FIGURE 5-2. SMALL SANDSTONE HILL MARKS THE WESTERN PORTION OF THE STUDY AREA.	27
FIGURE 5-3. VIEW OVER LIZZULEA DAM FROM THE HILL.....	27
FIGURE 5-4. VIEWS OF THE SURROUNDING LANDSCAPE FROM THE HILL.....	28
FIGURE 7-1: IRON AGE CERAMIC FACIES FOR THE MAPUNGUBWE REGION (ADAPTED FROM HUFFMAN 2009B). EARLY IRON AGE	32
FIGURE 7-2: DEFINITION OF <i>MZONJANI</i> CERAMICS ON THE LEFT AND <i>HAPPY REST</i> CERAMICS ON THE RIGHT (ADAPTED FROM HUFFMAN 2007A).....	33
FIGURE 7-3: DEFINITION OF <i>ZHIZO</i> CERAMICS ON THE LEFT AND <i>LEOKWE</i> CERAMICS ON THE RIGHT (ADAPTED FROM HUFFMAN 2007A).	34
FIGURE 7-4: MAP OF SOUTHERN AFRICA INDICATING MIGRATION ROUTES OF DIFFERENT IRON AGE TRADITIONS (ADAPTED FROM HUFFMAN 2007A).....	34
FIGURE 7-5: DEFINITION OF <i>K2</i> CERAMICS ON THE LEFT AND <i>TK2</i> CERAMICS ON THE RIGHT (ADAPTED FROM HUFFMAN 2007A) TRANSITIONAL OCCUPATION WAS EQUALLY DIVIDED BETWEEN FLOODPLAIN AND ESCARPMENT WHERE THERE IS A CLEAR DISTINCTION BETWEEN CATTLE AND AGRICULTURALLY ORIENTATED SETTLEMENTS. BY ABOUT AD 1250, THE <i>TK2 FACIES</i> CHANGED INTO CLASSIC MAPUNGUBWE CERAMICS.	35
FIGURE 7-6. STUDY AREA IN RELATION TO THE WHS OF MAPUNGUBWE AND BUFFER ZONE.	38
FIGURE 7-7. 1955 AERIAL IMAGE WITH THE APPROXIMATE STUDY AREA INDICATED IN BLUE. LIZZULEA DAM DID NOT EXIST AT THIS TIME. NO OTHER INFRASTRUCTURE IS VISIBLE APART FROM A DIRT ROAD TO THE EAST OF THE STUDY AREA.	39
FIGURE 7-8. 1964 AERIAL IMAGE WITH THE APPROXIMATE STUDY AREA INDICATED IN BLUE. LIZZULEA DAM DID NOT EXIST AT THIS TIME. NO OTHER INFRASTRUCTURE IS VISIBLE APART FROM AGRICULTURAL ACTIVITIES TO THE EAST OF THE STUDY AREA.	40
FIGURE 7-9. 1968 TOPOGRAPHICAL MAP OF THE STUDY AREA. LIZZULEA DAM DID NOT EXIST AT THIS TIME.	41
FIGURE 7-10. 1980 TOPOGRAPHICAL MAP OF THE STUDY AREA WITH LIZZULEA DAM TO THE SOUTH OF THE STUDY AREA.....	42
FIGURE 7-11. 1999 TOPOGRAPHICAL MAP OF THE STUDY AREA INDICATING LIZZULEA DAM AND AGRICULTURAL ACTIVITIES.....	43
FIGURE 8-1: KNOWN SITES IN THE WIDER AREA FROM THE WITS DATABASE AND SAHRIS.	44
FIGURE 8-2. SITES AND FEATURES RECORDED DURING THE SURVEY.	45
FIGURE 8-3. RECORDED SITES IN RELATION TO THE STUDY AREA.	46
FIGURE 8-4. VIEW OF THE SURROUNDING AREA FROM WAYPOINT 172.	48
FIGURE 8-5. ASHY AREA AT WAYPOINT 172.	48
FIGURE 8-6. DORSAL AND VENTRAL VIEWS OF LITHICS ILLUSTRATING THE RANGE OF RAW MATERIAL USED AT WAYPOINT 172.....	48
FIGURE 8-7. MSA BROKEN POINT ON THE LEFT AND LSA BACKED BLADE ON THE RIGHT. RECORDED AT WAYPOINT 172.	48
FIGURE 8-8. STONE AGE LITHICS AND RANGE OF RAW MATERIAL AT SITE 2229 AD 295.....	48
FIGURE 8-9. SMALL ASHY PATCH AT WAYPOINT 174	49
FIGURE 8-10. LITHICS ON HORNFELLS AT WAYPOINT 174	49
FIGURE 8-11. SITE 2229AD 296 VIEWED FROM THE NORTH.	50

FIGURE 8-12. SITE 2229AD 296 VIEWED FROM THE SOUTH.	50
FIGURE 8-13. POSSIBLE GRAIN BIN FOUNDATION.	50
FIGURE 8-14. BONE AND OSTICH EGG SHELL FRAGMENTS.....	50
FIGURE 8-15. STONE AGE FLAKES.	50
FIGURE 8-16. UNDECORATED CERAMICS AND IRON TANG FOR SPEAR OR ARROW.....	50
FIGURE 8-17. GREY PATCH AT WAYPOINT 177 VIEWED FROM THE SOUTH.	51
FIGURE 8-18. STONE ENCLOSURE WITH ENTRANCE (BLUE ARROW) FACING NORTH AT WAYPOINT 178.	52
FIGURE 8-19. UPPER GRINDING STONE ON WALL AT WAYPOINT 178.....	52
FIGURE 8-20. ENCLOSURE VIEWED FROM THE WEST AT WAYPOINT 178.....	52
FIGURE 8-21. UNDECORATED CERAMICS INSIDE ENCLOSURE AT WAYPOINT 178.	52
FIGURE 8-22. SITE 2229AD 208 & SITE 2229AD 209 VIEWED FROM THE NORTH.	54
FIGURE 8-23: GRAIN BIN STAND AT 2229AD 208.....	54
FIGURE 8-24: GRAIN BIN STAND AT 2229AD 208.....	54
FIGURE 8-25: UNDECORATED CERAMICS AT 2229AD 209.....	54
FIGURE 8-26: VITRIFIED DUNG AT 2229AD 209.....	54
FIGURE 8-27: EXISTING ACCESS ROAD CUTTING THROUGH VITRIFIED DUNG DEPOSITS MARKING SITE 2229AD 208 ON THE RIGHT AND SITE 2229AD 209 ON THE LEFT.....	54
FIGURE 8-28. PALEONTOLOGICAL SENSITIVITY OF THE STUDY AREA AS INDICATED ON THE SAHRA PALAEOLOGICAL SENSITIVITY MAP.	56
FIGURE 9-1. RECORDED HERITAGE FEATURES AND EXTENT OF THE SITES IN RELATION TO THE IMPACT AREA.....	59

LIST OF TABLES

TABLE 0-1. SPECIALIST REPORT REQUIREMENTS.....	4
TABLE 1-1: PROJECT DESCRIPTION	13
TABLE 1-2: INFRASTRUCTURE AND PROJECT ACTIVITIES.....	13
TABLE 3-1: SITE INVESTIGATION DETAILS.....	19
TABLE 8-1. SITES & FEATURES RECORDED DURING THE SURVEY	46
TABLE 9-1. SIGNIFICANCE AND PROPOSED MITIGATION OF HERITAGE SITES	57
TABLE 9-2. ICOMOS SYSTEM FOR ASSESSING/ EVALUATING IMPACT.....	58
TABLE 9-3. IMPACT ASSESSMENT.....	60

ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 Introduction and Terms of Reference:

HCAC is contracted by Alta van Dyk Environmental Consultants to conduct a heritage impact assessment of the proposed VLNR lodge development. The site is located on the farm Lizzulea 62 MS in the Vhembe District Municipal area, Limpopo Province (Figure 1-1 to 1-3).

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, Iron Age sites and Stone Age lithics were recorded. General site conditions and features on sites were recorded by means of photographs, GPS locations and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA. As such the Basic Assessment report and its appendices must be submitted to the case as well as the EMP, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

1.2 Project Description

The project comprises a lodge development as described in Table 1-1 and 1-2.

Table 1-1: Project Description

Farm	Lizzulea 62 MS
Magisterial District	Musina Local Municipality, Vhembe District
1: 50 000 map sheet number	2229 BA
Central co-ordinate of the development	22°20'36.73"S 29°19'45.43"E

Table 1-2: Infrastructure and project activities

Type of development	Development of a lodge
Project size	Approximately 1.5 hectares
Project Components	Lodge and associated amenities

1.3 Alternatives

No alternatives were provided for assessment although the extent of the area assessed allows for siting of the development to minimise impacts to heritage resources.

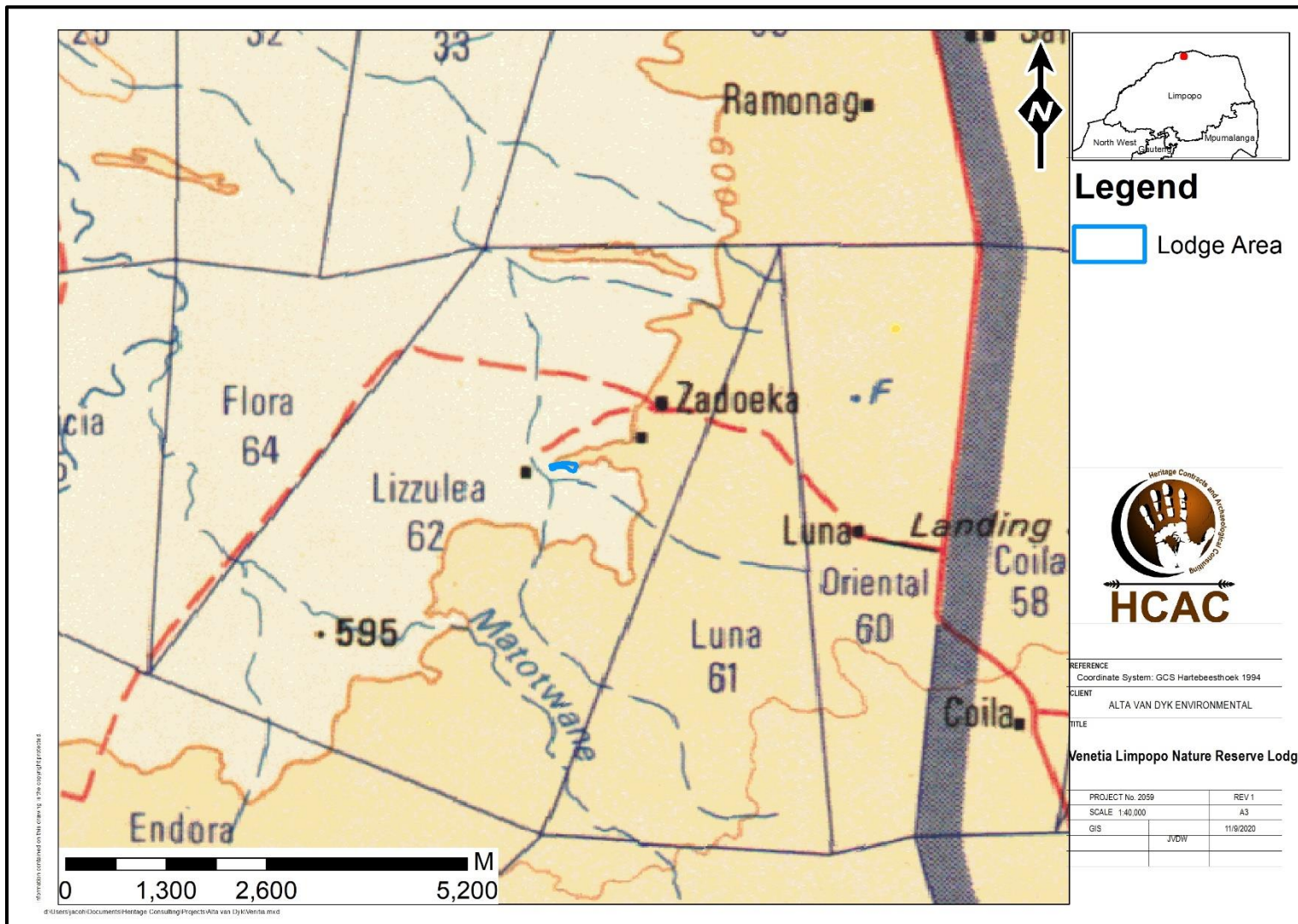


Figure 1-1. Regional setting (1: 250 000 topographical map).

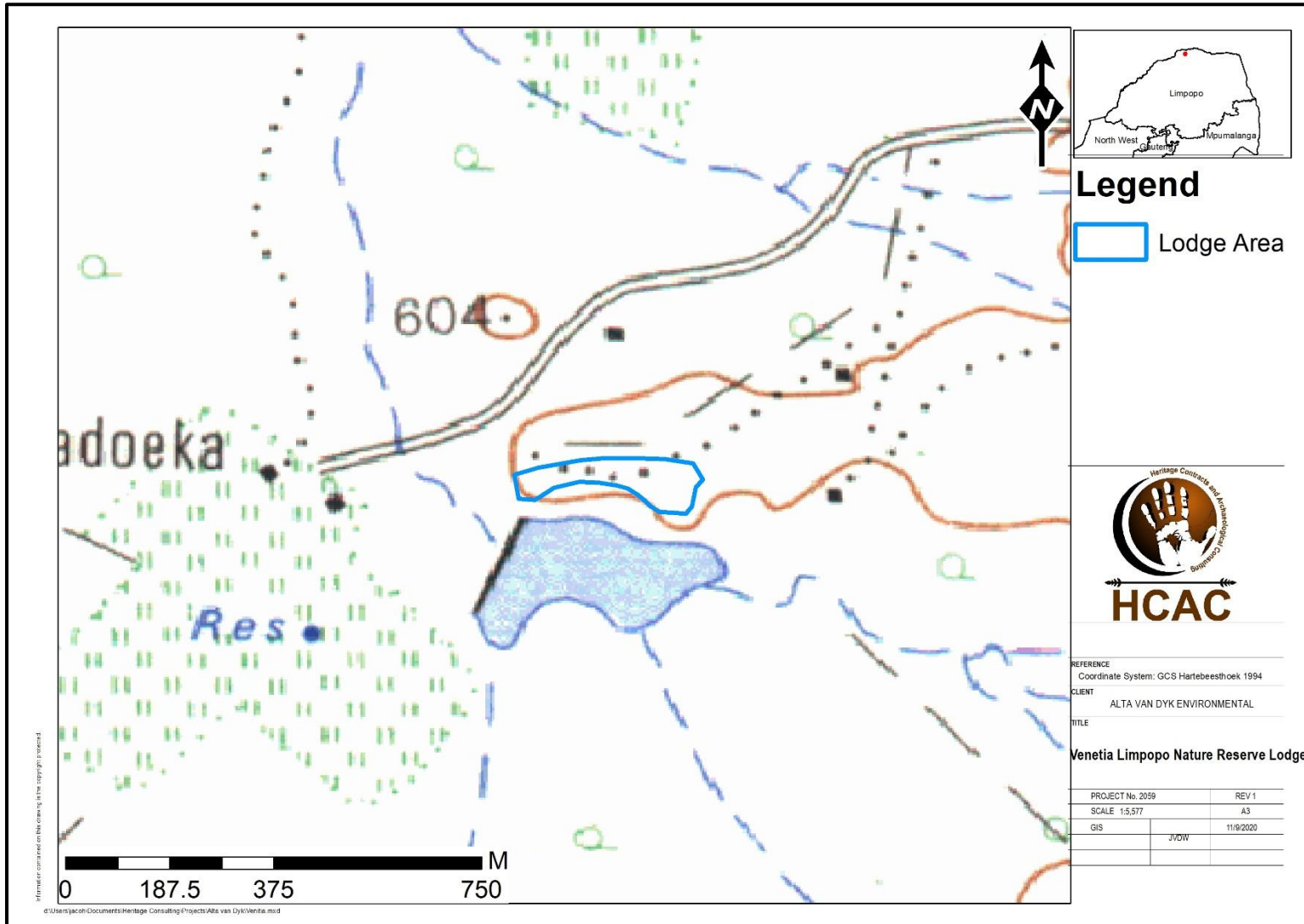


Figure 1-2: Local setting (1:50 000 topographical map).

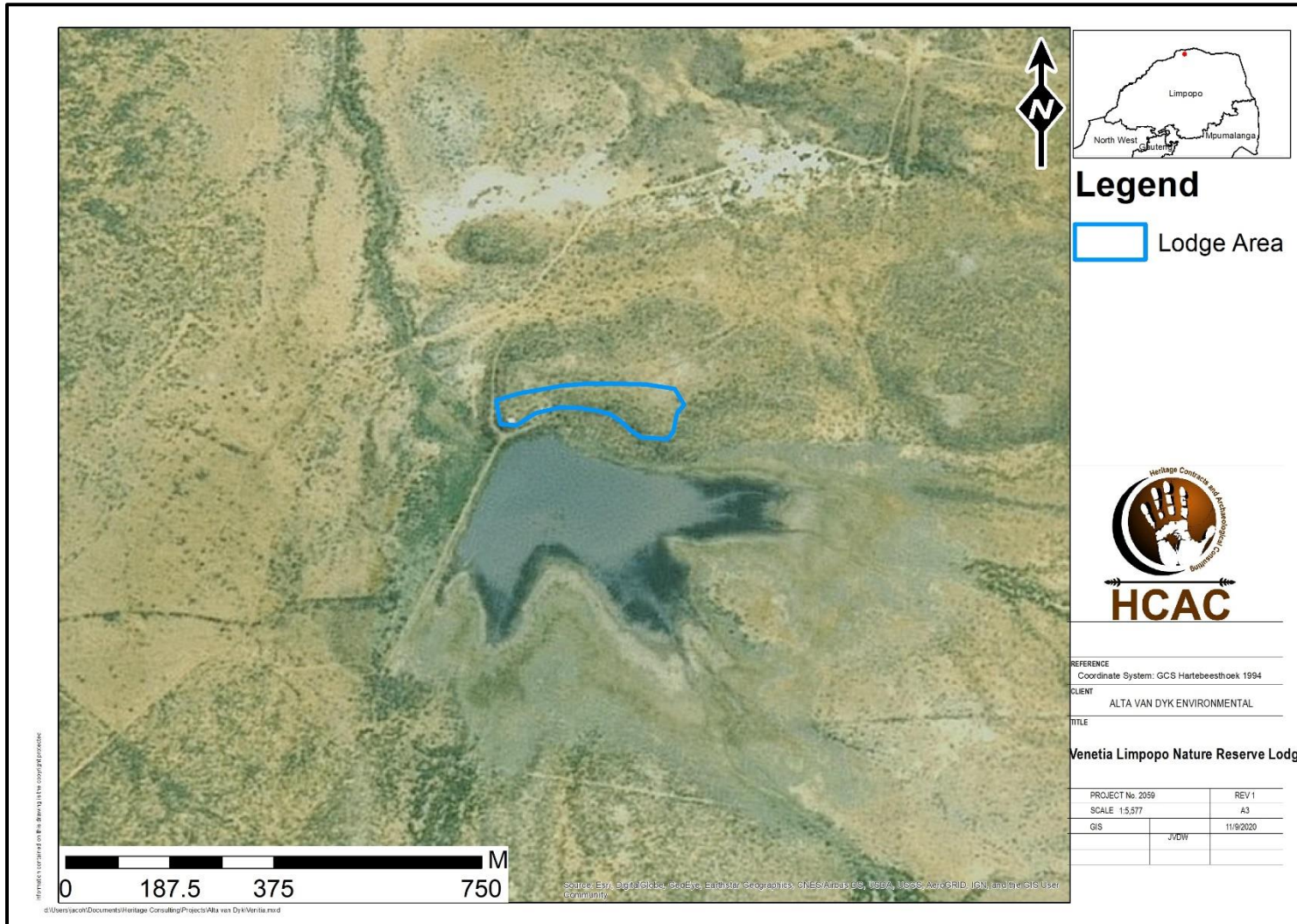


Figure 1-3. Satellite image of the study area.

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999 is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the fieldwork phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any BAR process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of a Report.

Please refer to section 6 for more detail.

3.4 Site Investigation

The purpose of the site investigation was to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 3-1: Site Investigation Details

	Site Investigation
Date	20 October 2020
Season	Summer – vegetation in the study area is low and archaeological visibility is high in most of the study area. The impact area was sufficiently covered (Figure 3-1) to understand the heritage character of the study area.

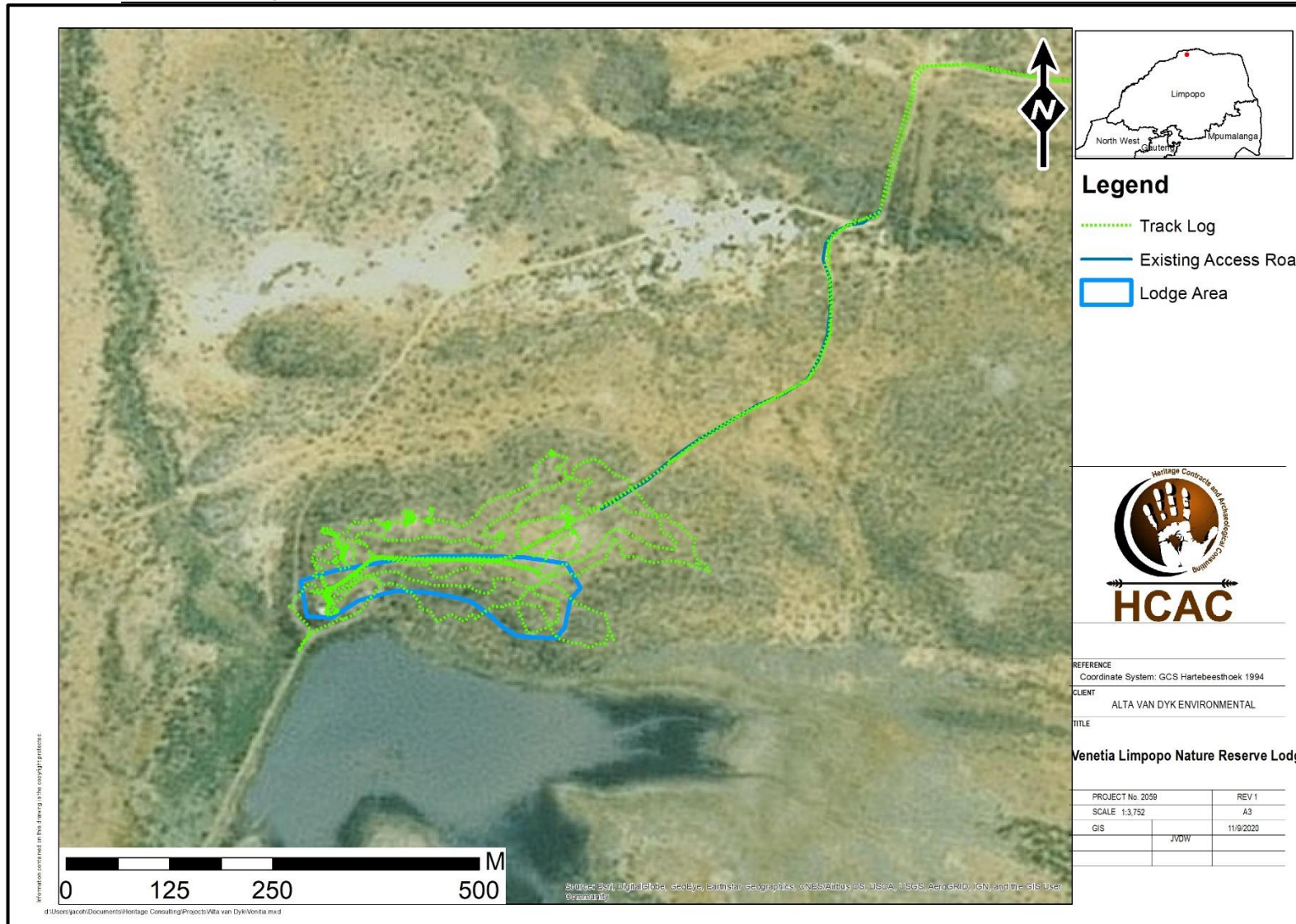


Figure 3-1: Track log of the survey in green.

3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

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

3.6 Impact Assessment Methodology

The following impact assessment methodology was provided by the AVDE:

The significance of the identified impacts will be determined using an accepted methodology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998 as provided by the EAP. As with all impact methodologies, the impact is defined in a semi-quantitative way and will be assessed according to methodology prescribed in the following section.

Scale utilised for the evaluation of the Environmental Risk Ratings

Evaluation Component	Rating	Scale	Description / criteria
MAGNITUDE of negative impact (at the indicated spatial scale)	10	Very high	Bio-physical and/or social functions and/or processes might be <i>severely</i> altered.
	8	High	Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered.
	6	Medium	Bio-physical and/or social functions and/or processes might be <i>notably</i> altered.
	4	Low	Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered.
	2	Very low	Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered.
	0	Zero	Bio-physical and/or social functions and/or processes will remain <i>unaltered</i> .
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	10	Very high	Positive: Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced.
	8	High	Positive: Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced.
	6	Medium	Positive: Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced.
	4	Low	Positive: Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced.
	2	Very low	Positive: Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced.

	0	Zero	Positive: Bio-physical and/or social functions and/or processes will remain <i>unaltered</i> .
DURATION	5	Permanent	Impact in perpetuity. –
	4	Long term	Impact ceases after operational phase/life of the activity > 60 years.
	3	Medium term	Impact might occur during the operational phase/life of the activity – 60 years.
	2	Short term	Impact might occur during the construction phase - < 3 years.
	1	Immediate	Instant impact.
EXTENT (or spatial scale/influence of impact)	5	International	Beyond the National boundaries.
	4	National	Beyond provincial boundaries, but within National boundaries.
	3	Regional	Beyond 5 km of the Impact Area and within the provincial boundaries.
	2	Local	Within a 5 km radius of the Impact Area .
	1	Site-specific	On site or within 100 meters of the site boundaries.
	0	None	Zero extent.
IRREPLACEABLE loss of resources	5	Definite	Definite loss of irreplaceable resources.
	4	High potential	High potential for loss of irreplaceable resources.
	3	Moderate potential	Moderate potential for loss of irreplaceable resources.
	2	Low potential	Low potential for loss of irreplaceable resources.
	1	Very low potential	Very low potential for loss of irreplaceable resources.
	0	None	Zero potential.
REVERSIBILITY of impact	5	Irreversible	Impact cannot be reversed.
	4	Low irreversibility	Low potential that impact might be reversed.
	3	Moderate reversibility	Moderate potential that impact might be reversed.
	2	High reversibility	High potential that impact might be reversed.
	1	Reversible	Impact will be reversible.
	0	No impact	No impact.
PROBABILITY (of occurrence)	5	Definite	>95% chance of the potential impact occurring.
	4	High probability	75% - 95% chance of the potential impact occurring.
	3	Medium probability	25% - 75% chance of the potential impact occurring
	2	Low probability	5% - 25% chance of the potential impact occurring.
	1	Improbable	<5% chance of the potential impact occurring.
	0	No probability	Zero probability.
Evaluation Component	Rating scale and description / criteria		
CUMULATIVE impacts	<p>High: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Medium: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Low: The activity is localised and might have a negligible cumulative impact.</p> <p>None: No cumulative impact on the environment.</p>		

Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 8.2 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

Scale used for the evaluation of the Environmental Significance Ratings

Significance Score	Environmental Significance	Description / criteria
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked at.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. It is assumed that the spatial data available to the author for the World Heritage Site and buffer zones are accurate and up to date. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio Economic Environmental

According to StatsSA the Musina Municipality is a multi-racial municipality, due to the influence of the mining industry and the Beit bridge border gate. Only 50% of the population in the municipality speaks Tshivenda as their first language, followed by 8,8% who speak Sesotho, which is unusual in this area. The population in the municipality is dominated by people of aged 15–36. There are over 20 042 household in Musina Municipality with an average of 3,1 persons per household. The majority of households live in a house or brick/concrete block structures at 78%, followed by those who lives in traditional dwelling at 15,4 %. The majority of households in the district have access to piped water at 93%.

5 Description of the Physical Environment:

The prevailing vegetation type and landscape features of the larger area form part of the Musina Mupane Bushveld. It is described as undulating plains to very irregular plains with some hills (Figure 5-1). The area is characterised by open woodland to moderately closed shrubveld, dominated by *Colophospermum mopane* on clayey bottomlands and *Combretum apiculatum* on hills. Where basalt occurs the area is dominated by *Colophospermum mopane* and *Terminalia prunoides*. On areas with deep sandy soils, moderately open savannah is dominated by *Colophospermum mopane*, *T. sericea*, *Grewia flava* and *Combretum apiculatum* (Mucina & Rutherford, 2006).

The study area is located to the south of the Limpopo floodplain on a small sandstone hill (Figure 5-2) providing vistas of the surrounding landscape. Lizzulea dam (Figure 5-3) is to the south of the hill and flat Mopane Bushveld (Figure 5-4) around the hill.



Figure 5-1. Landscape context of the study area.



Figure 5-2. Small sandstone hill marks the western portion of the study area.



Figure 5-3. View over Lizzulea dam from the hill.



Figure 5-4. Views of the surrounding landscape from the hill.

6 Results of Public Consultation and Stakeholder Engagement:

6.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the BA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process. A specialist on the area Professor Thomas Huffman was also consulted by the author.

7 Literature / Background Study:

7.1 Literature Review (SAHRIS)

The study area is located south of the World Heritage Site of Mapungubwe. Although the site is located outside of the World Heritage Site it is within the buffer zone and a vast amount of research is available on the general area. In addition, the University of the Witwatersrand was commissioned to conduct research on the Iron Age sites in the area (Huffman 2007 and 2008) and were consulted for this report. Reports included finds ranging from fossils and Stone age sites to important Farming Communities/ Iron Age Settlements as well as burial sites. For the purposes of this report the term Iron Age will be used, in line with the referenced sources. The following CRM assessments were consulted for this report:

Author	Year	Project	Findings
Gaigher, S.	2000	Preliminary Archaeological impact assessment of two agricultural fields on the farm Alyth 118MS	Stone Age, Iron Age and burial sites.
Huffman, T.	2003	Archaeological assessment of tourism developments in the Mapungubwe Cultural Landscape.	Stone Age and Iron Age sites
Munyai, R & Roodt, F.	2007	Heritage Impact Assessment – an archaeological investigation of a proposed irrigation dam at farm Overvlakte 125 MS, Musina Municipality, Vhembe district,	No sites
Huffman, TN	2007	The Origins Of Mapungubwe Project Project Summary 2003-2007	Iron Age research
Huffman, TN	2008	Origins Of Mapungubwe Project Progress Report 2008 A progress report prepared for De Beers, the NRF, SAHRA and SANParks	Iron age research
Roodt, F.	2009	Heritage Impact Assessment Report Proposed Vele Colliery Weipe Vhembe District Municipality: Limpopo	Stone Age, Iron Age, Grave Sites and Historical structures.
Huffman, T.N. & Van der Walt, J.	2011	Heritage Survey For The Limpopo Project. A Pre-feasibility field study prepared for Anglo American Thermal Coal, Geological Services	2 ESA, 13 MSA, 6 LSA, 144 Iron Age, 1 Historic house.
Pikarayi, I. Chirikure, S. Manyanga, M Mothulatshipi, S.	2012	Heritage Impact Assessment Report and Management Plan Relating to the Establishment of the Vele Colliery near Mapungubwe World Heritage Site, Musina, Limpopo Province: South Africa	36 Sites ranging from Stone Age artefacts to significant Iron Age and Burial sites.
Steggman, L. & Roodt, F.	2018	Phase 1 Heritage Resources Scoping Report Proposed Expansion of the Existing Dam on Rem Portion of the Farm Overvlakte 125 MS, Musina Local Municipality, Vhembe District, Limpopo Province	Iron Age grain bin and ceramic site. The study also indicated that for the paleontological component there is a very high likelihood of the occurrence of fossils, typically palaeoflora of <i>Glossopteris</i> , <i>Dadoxylon</i> and <i>Vertebraria</i> within the lower Karoo strata

HIA – VLNR Lodge			November 2020
Van der Walt, J.	2020	Heritage Impact Assessment Skutwater 115 MS, Limpopo Province.	Several Iron Age/ Farming Community sites were recorded.

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

7.2 General History of the area

7.2.1 Archaeology of the area

The archaeological record for the greater study area consists of the Stone Age and Iron Age.

7.2.1.1 Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age (LSA), the Middle Stone Age (MSA) and the Earlier Stone Age (ESA). Each of these phases contain sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. The three main phases can be divided as follows;

- * Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago
- * Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- * Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000- > 2 million years ago.

The larger geographical area was inhabited since the ESA and was subjected to intensive research (Kuman *et al* 2000). Isolated hand axes have been found on Venetia, but they have little value. The most important site is Kudu Koppie on the farm Samaria. It is one of the few sites in the country with late ESA stratified under the MSA (Pollarolo & Kuman 2009). Other ESA artefacts have eroded from the edge of the escarpment facing the Limpopo River. These ESA (and MSA) artefacts rest on top of a calcrete layer, or on the sandstone bedrock. The artefacts include numerous cores made from quartzite cobbles found at the foot of the escarpment. These cobbles in turn are eroding out of decalcified alluvial gravels deposited by the Limpopo River (Huffman & van der Walt 2011).

MSA artefacts are common throughout the Limpopo Valley, but unless they occur in undisturbed deposits, they have little significance. Generally, a few MSA artefacts, such as cores, can occur anywhere across the plateau, while many more lay scattered along the escarpments because of deflation and erosion (Le Baron *et al.* 2010). The homogenous distribution suggests resources were also evenly distributed across the plateau. It is not possible to tell, however, if the scatter is the result of short intensive use or repeated use over a longer period. The sand mantel above the calcrete and sandstone varies from 0.1 to 5.6m in depth. It is largely derived from the Clarens Formation that forms the local sandstone bedrock. The mantel itself dates to the Holocene, in this case from about 14 000 to 25 000 years ago (Kuman *et al.* 2005). As a rule, only LSA artefacts occur in the sand. In terms of the MSA evidence of bipolar flaking that is associated with the MSA Pietersburg Industry (Mason 1962) occurs at the earlier Limpopo site, Kudu Koppie (Sumner 2013).

During the LSA, people started to occupy sites on a recurring basis often in rock shelters and caves and often left panels of rock art in these shelters a rock art survey on both sides of the Limpopo Sashi confluence area identified close to 150 rock art sites (Eastwood and Cnoops 1999). Work on both open sites and rock shelters indicate that LSA people lived in the area from about 11 000 years ago (Van Doornum 2008). Occupation intensified, however, when farmers moved into the valley. One important shelter on the farm

Little Muck suggests that Iron Age farmers took over some rock shelters from foragers for their own ritual use (Hall & Smith 2000).

7.2.1.2 *The Iron Age*

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. The Iron Age is divided into three distinct periods:

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

Phases within each period are marked by different ceramic *facies* (Figure 7-1). A short summary of occupation in the Limpopo valley will now be discussed.

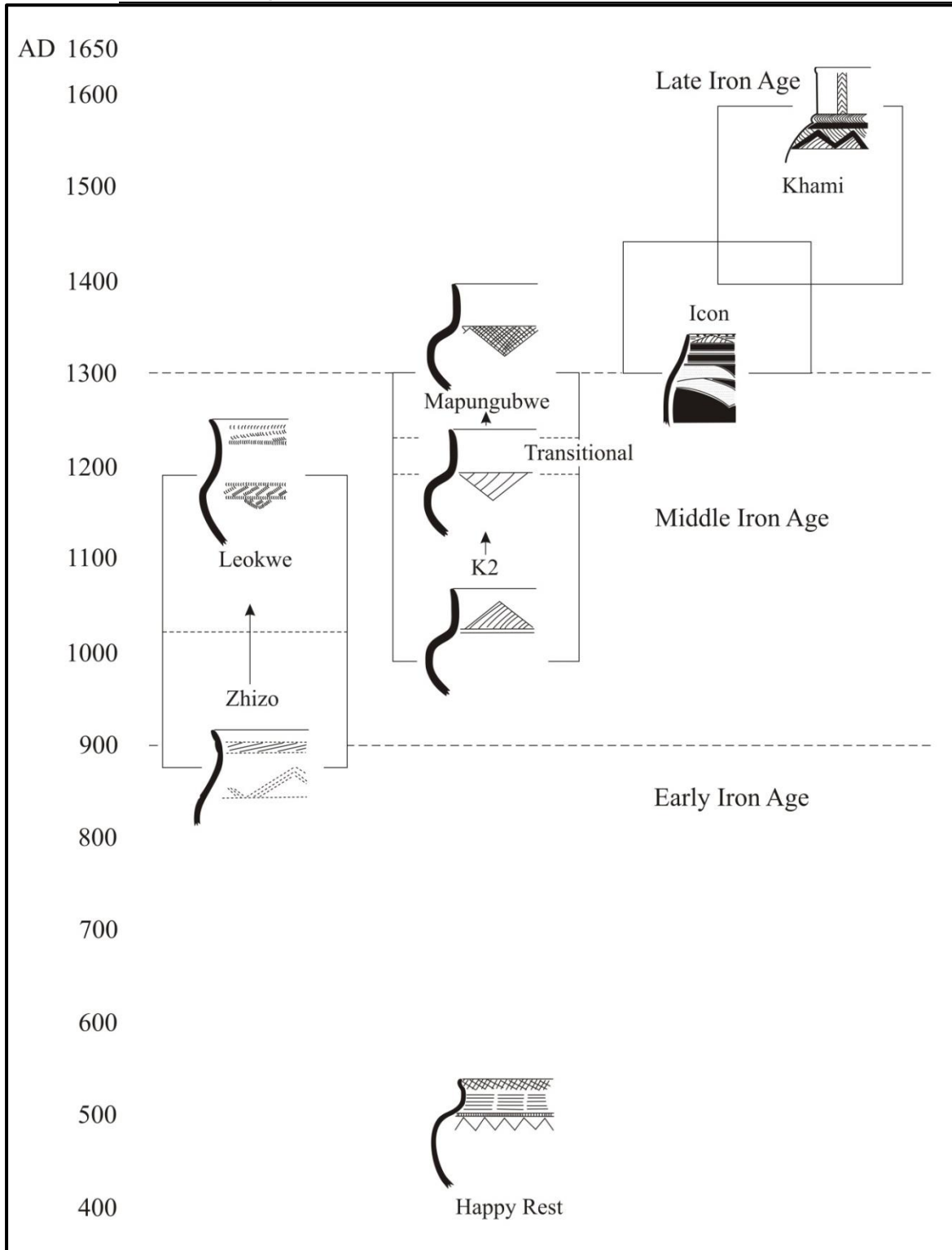


Figure 7-1: Iron Age ceramic facies for the Mapungubwe region (Adapted from Huffman 2009b).

Early Iron Age

Between AD 500 and 700, agro-pastoralists joined the hunter gatherers in the region. This was marked by ceramics belonging to the *Happy Rest* and *Mzonjani* facies (Figure 7-2). These societies were patrilineal (cf. Hammond-Tooke 1993) and spoke an Eastern Bantu language (Huffman & Herbert 1994/1995).

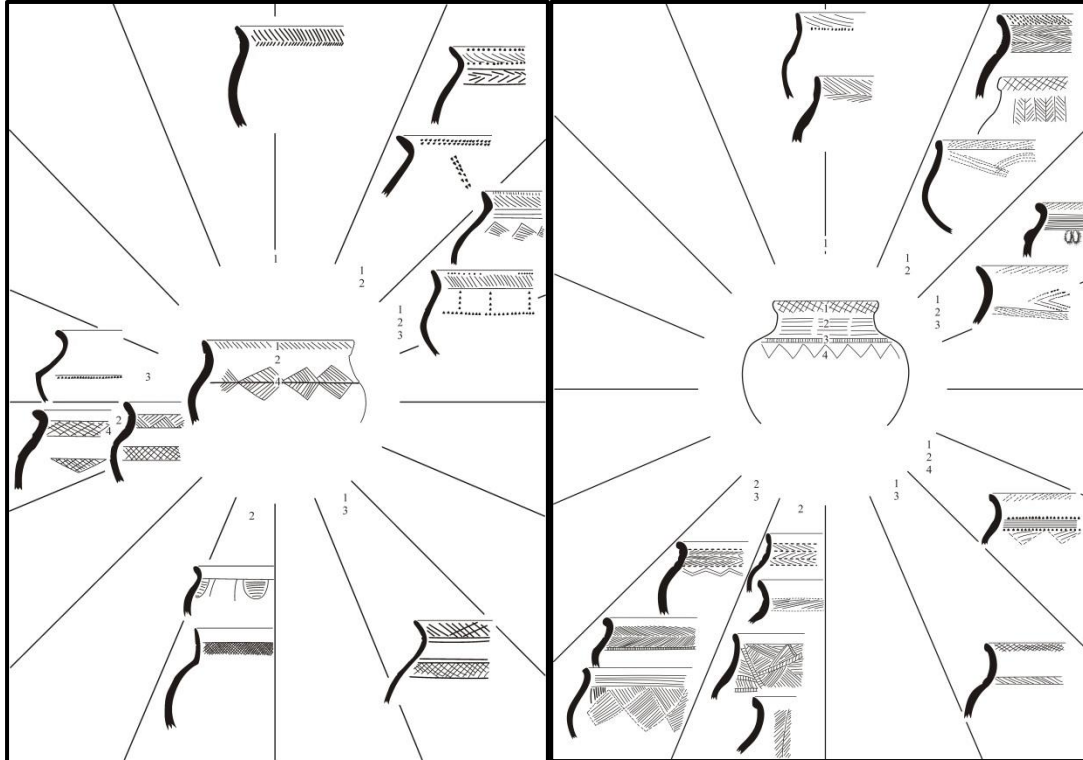


Figure 7-2: Definition of *Mzonjani* ceramics on the left and *Happy Rest* ceramics on the right (Adapted from Huffman 2007a).

After this initial intrusion, agro-pastoralists seem to have abandoned the area until AD 900 because of adverse climatic conditions (Huffman 1996a). From AD 900 to 1000, *Zhizo* pottery (Figure 7-3) marks the second phase of occupation. *Zhizo* ceramics belong to the Nkope Branch of the Urewe Tradition (or Central Stream) (Figure 7-4). Initially it was thought that *Zhizo* people moved into the area to practise agriculture (Huffman 1996a). However, isotopic analysis shows that the climate was no better than today (Smith 2005). *Zhizo* farmers would therefore have found farming difficult, and some other factors must have lured them to the area. Presumably, they moved in to the valley to take advantage of the East Coast trade (Huffman 2000; Smith 2005), where the Limpopo River acted as a route into the interior. The location of settlements (most are located well away from the rich agricultural soils around the floodplain because elephants would have destroyed the crops) as well as ivory chippings and exotic goods at Schroda (Hanisch 1980) suggest that trade was the main attraction. Ivory, like gold, was a lucrative export commodity, and historical accounts record large amounts of ivory reaching Sofala from the interior (Kusimba 1999). In addition, the wide distribution of *Zhizo*-period glass beads (Wood 2005) suggests that *Zhizo* people traded them for grain with more successful farmers outside the valley.

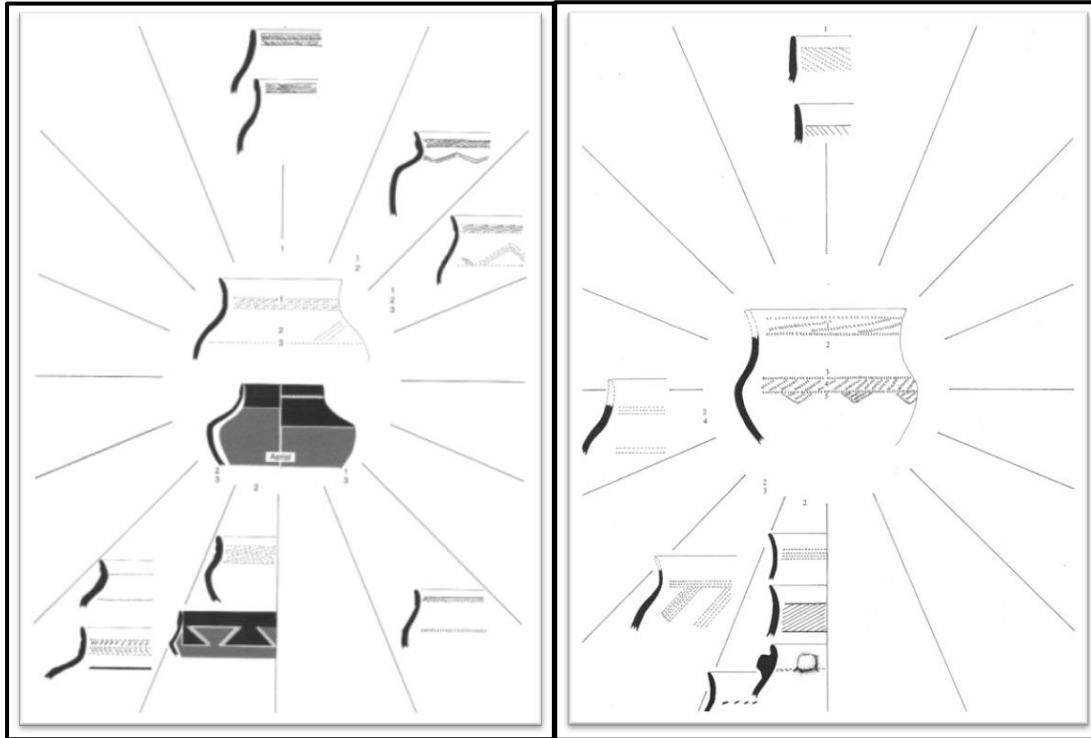


Figure 7-3: Definition of Zhizo ceramics on the left and Leokwe ceramics on the right (Adapted from Huffman 2007a).

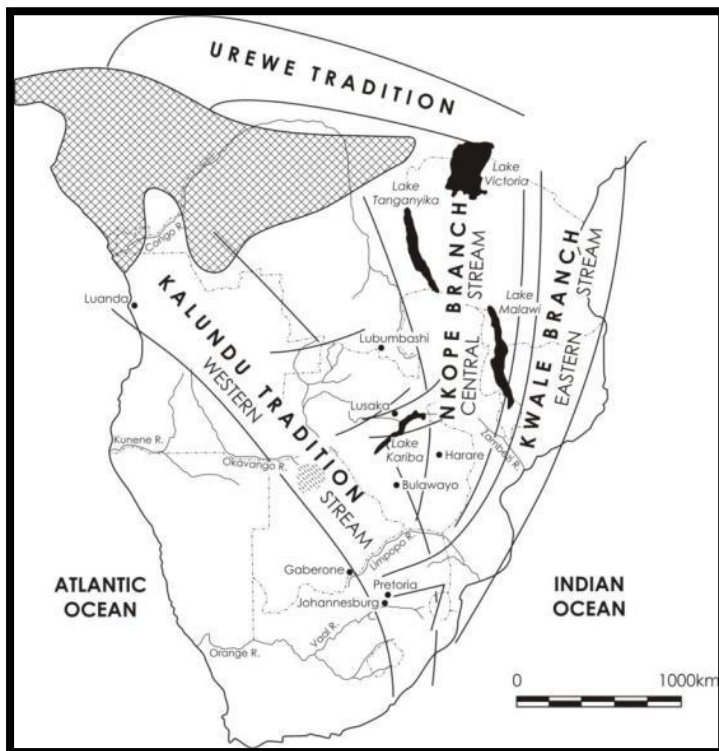


Figure 7-4: Map of southern Africa indicating migration routes of different Iron Age Traditions (Adapted from Huffman 2007a).

Middle Iron Age

After approximately 100 years, around AD 1010, the Zhizo political control over the area and coastal trade was terminated by the arrival of new agro-pastoralists that archaeologists refer to as Leopard's Kopje. Leopard's Kopje ceramics are derived from the *Doornkop* facies (formerly Lydenburg) to the south (Huffman 2007a), an Early Iron Age phase of the Kalundu Tradition (Figure 7-4).

After replacing the Zhizo chiefdom, Leopard's Kopje people established their capital at K2, located at the base of Bambandyanalo Hill (Fouché 1937; Gardner 1963). K2 was occupied between AD 1000 and 1220 (Vogel 2000). This period was marked by higher rainfall (Smith 2005), resulting in an emphasis on floodplain agriculture (Huffman 2000; Smith 2005) allowing for population growth.

Changes in world view are marked by a shift away from the Central Cattle Pattern (CCP) to the elite Zimbabwe Pattern (ZP). The new ideology of sacred leadership was materialised when Leopard's Kopje people abandoned K2 for Mapungubwe, less than a kilometre away.

During this period (AD 1200 to 1250) of transition the ceramic style also changed (Figure 7-5). These transitional ceramic facies are now termed *Transitional K2*, or *TK2*.

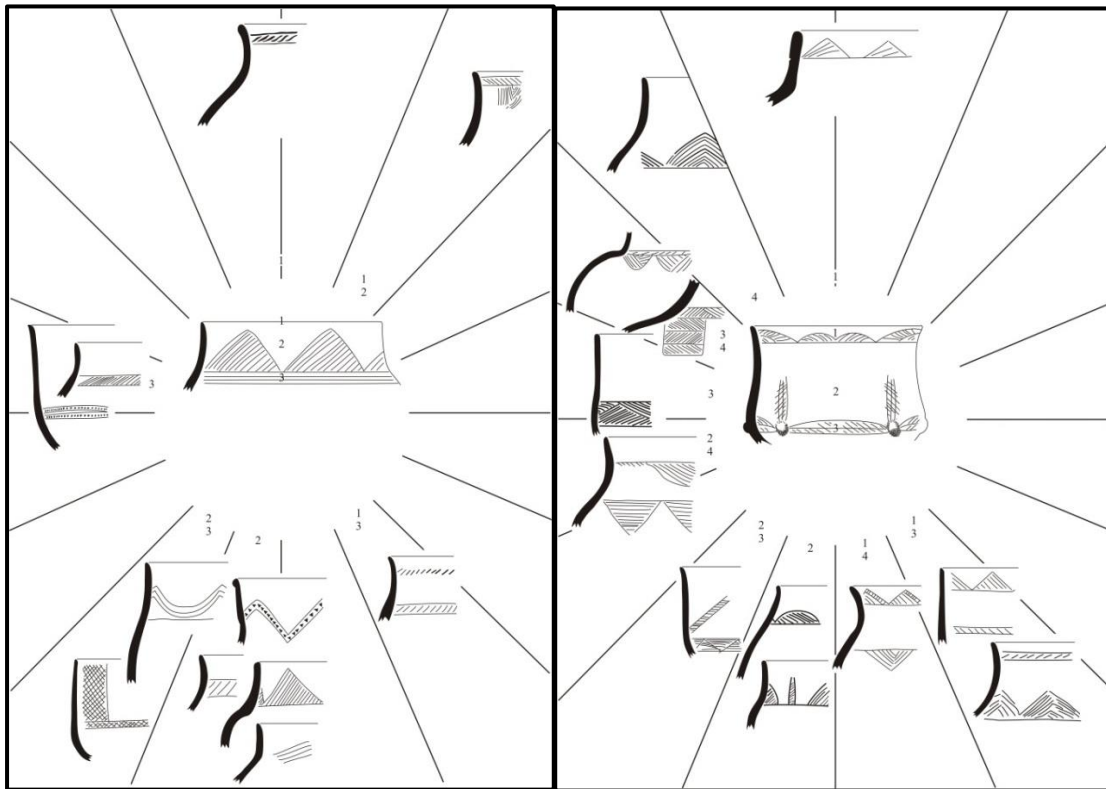


Figure 7-5: Definition of *K2* ceramics on the left and *TK2* ceramics on the right (Adapted from Huffman 2007a) Transitional occupation was equally divided between floodplain and escarpment where there is a clear distinction between cattle and agriculturally orientated settlements. By about AD 1250, the *TK2* facies changed into classic Mapungubwe ceramics.

7.3 Historical Information

In 1903 the copper deposits in the Musina area were investigated by Colonel John P Grenfell. He also established the Messina (Transvaal) Development Company Limited to exploit the copper deposits. The town of Messina now referred to as Musina was founded in 1904 on the farm Berkenrode, as a result of the exploitation of the copper deposits. It was proclaimed as town in 1957 (Hammerbeck & Schoeman 1976).

7.3.1 Background to the Venetia Mine and Cultural Landscape

The following information was provided by the client: *Diamond-bearing gravels were discovered as early as 1903 close to the Limpopo River, 35km north-east of the present mine. De Beers Group began a sampling programme in 1969 to locate the source of these alluvial diamonds. Viable kimberlite pipes were discovered in 1980. Work on the mine started in 1990, Venetia mine opened in 1992 and full production was achieved in 1993.*

The Vhembe/Dongola National Park was declared on 09 April 1998 (GN 490 in GG 18814). The Mapungubwe Cultural Landscape (MCL) was gazetted as a National heritage site by the South African Heritage Resources Agency (SAHRA) in December 2001. The MCL was inscribed on the United Nations Education, Scientific and Cultural Organization's (UNESCO) World Heritage List in 2003. In Government Notice No. 71 of 30 January 2009 (GN 31832) the then Minister Marthinus van Schalkwyk declared the MCL as a World Heritage Site in terms of the World Heritage Convention Act (Act 49 of 1999), and delegated specified powers of management to SANParks. The park name was changed to Mapungubwe National Park (MPNP) on 30 July 2004 (GN 900 in GG 26602). The park also forms the core of the Vhembe Biosphere Reserve. At international level, close liaison is required with the UNESCO World Heritage Centre and the Greater Mapungubwe Transfrontier Conservation Area (GMTFCA) involving Botswana, Zimbabwe and South Africa. The core area of the World heritage site comprises 28,168.66 ha. Various privately owned properties make up the buffer zone, which, added to the core, comprises some 100,000 ha.

Venetia Mine is located approximately 22km south of the Mapungubwe National Park. In 2014 the Unesco committee approved a new boundary and buffer zone for Mapungubwe in response to the past concerns regarding the impacts of mining on the site. The Venetia Mining Rights Area have been removed from the 2009 proclaimed boundary as per the 2014 revised buffer zone. Venetia Mine is surrounded by the Venetia Limpopo Nature Reserve (VLNR) that was established in 1991. The gazetted buffer zone surrounding the core of the Mapungubwe Cultural Landscape World Heritage Site (MCLWHS) extended to approximately 20 km from the core at the Mapungubwe Hill.

Since the listing of Mapungubwe as a World Heritage Site in 2003, the management authorities have always ensured co-existence between responsible diamond mining at Venetia, located on the periphery of the buffer zone, but with operational assets such as boreholes, pump stations and water storage dam located within the core of the WHS. The large section of the buffer zone falls in the De Beers VLNR whose objectives include maintaining the integrity and authenticity of the cultural landscape through continuous monitoring and impact assessments in the VLNR and areas affected by the Venetia Mine water provision assets. De Beers has had a long-term role in managing mining and sustainable conservation in the region. The VLNR, which surrounds the Venetia Mine, has created a viable buffer between the mined area and the biophysical and cultural resources conservation area. The reserve, which now forms part of the MCLWHS buffer zone, has always added extra protection to cultural heritage sites around the core of the listed property.

7.3.2 Anglo-Boer War

No sites dating to the Anglo-Boer War are known close to the study area.

7.3.3 Cultural Landscape

Musina was occupied by pre-historic copper miners, before prospector John Pascoe Grenfell laid out claims in 1904 and the mining town of “Messina” developed from there (Bulpin, 1980). It is still a mining town, but a lot of attention is currently on the cross-border trade with Zimbabwe. Musina is the seat of the local municipality and is also the economic and commercial hub of the region.

The World Heritage site of Mapungubwe is located approximately 13km to the north of the development and the proposed lodge is located within the buffer zone (Figure 7-6). The Mapungubwe Cultural Landscape is comprised of:

- Remains of palaces – (Mapungubwe period);
- Archaeological remains testifying to Mapungubwe’s growth 900-1200 AD (Zhizo, Leopard’s Kopje);
- Remains of early settlement: Stone Age & Iron Age & rock art;
- ‘Natural’ landscape surrounding the built remains;
- Intangible heritage: Mapungubwe Hill associated with sacredness, beliefs, customs and traditions of local communities;
- Living heritage: continuing traditions and associations such as rain making, and participation by local communities in reburial ceremonies;
- Landscape sharing and interaction between farmers and hunter-gatherers.

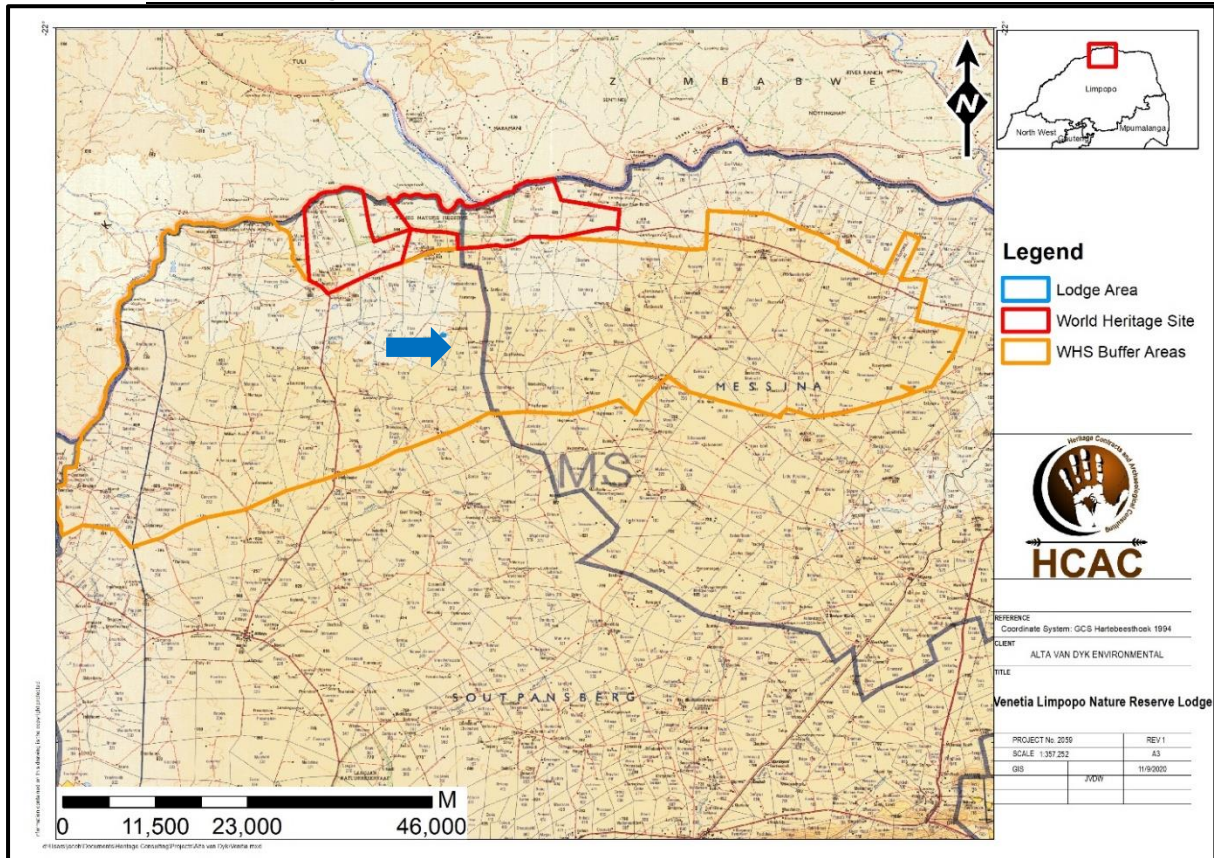


Figure 7-6. Study area in relation to the WHS of Mapungubwe and buffer zone.

The area has been subjected to limited development from prior to 1967 (Figure 7-7) and successive historical topographic maps indicate the changes in the study area and surrounds (Figure 7-8 and Figure 7-9).



Figure 7-7. 1955 Aerial image with the approximate study area indicated in blue. Lizzulea dam did not exist at this time. No other infrastructure is visible apart from a dirt road to the east of the study area.



Figure 7-8. 1964 Aerial image with the approximate study area indicated in blue. Lizzulea dam did not exist at this time. No other infrastructure is visible apart from agricultural activities to the east of the study area.

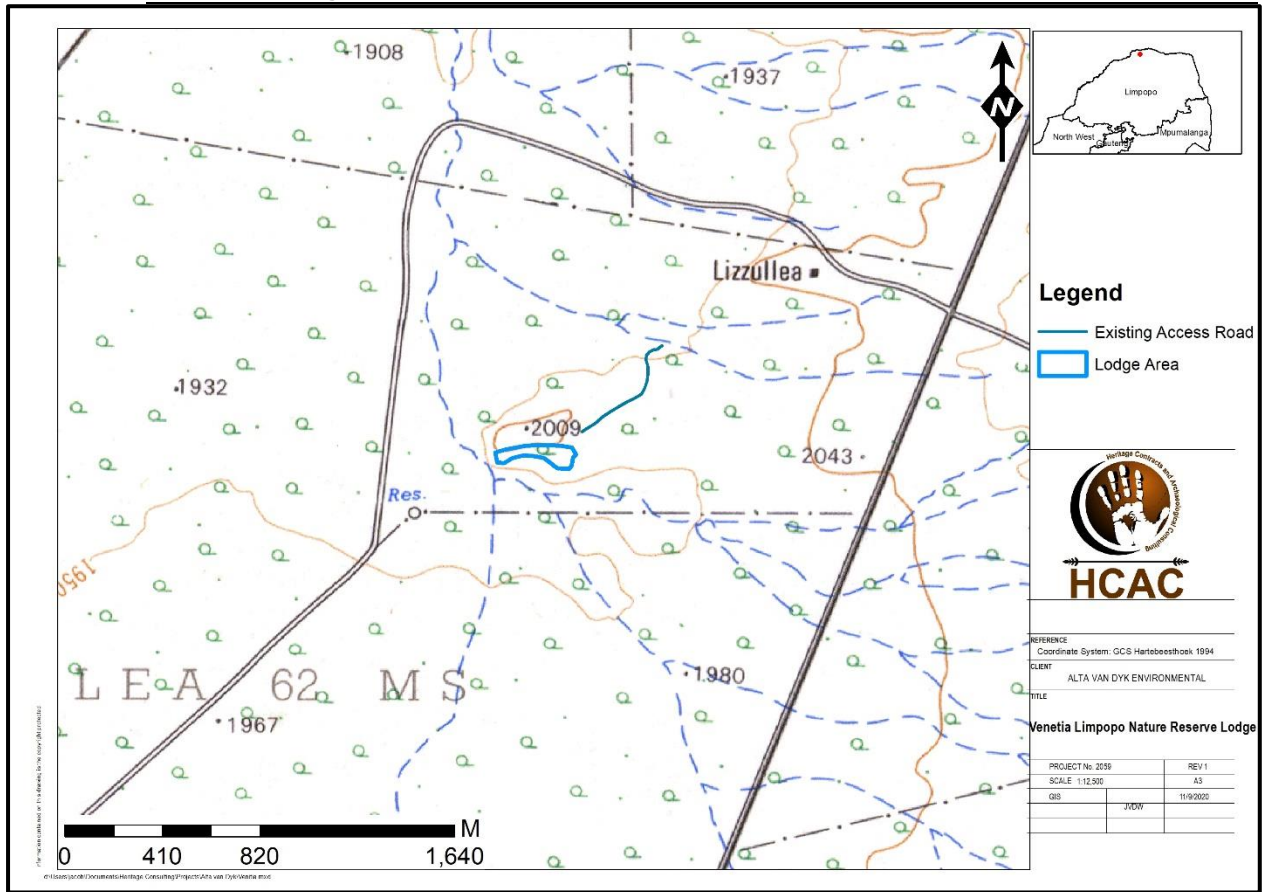


Figure 7-9. 1968 Topographical map of the study area. Lizzulea dam did not exist at this time.

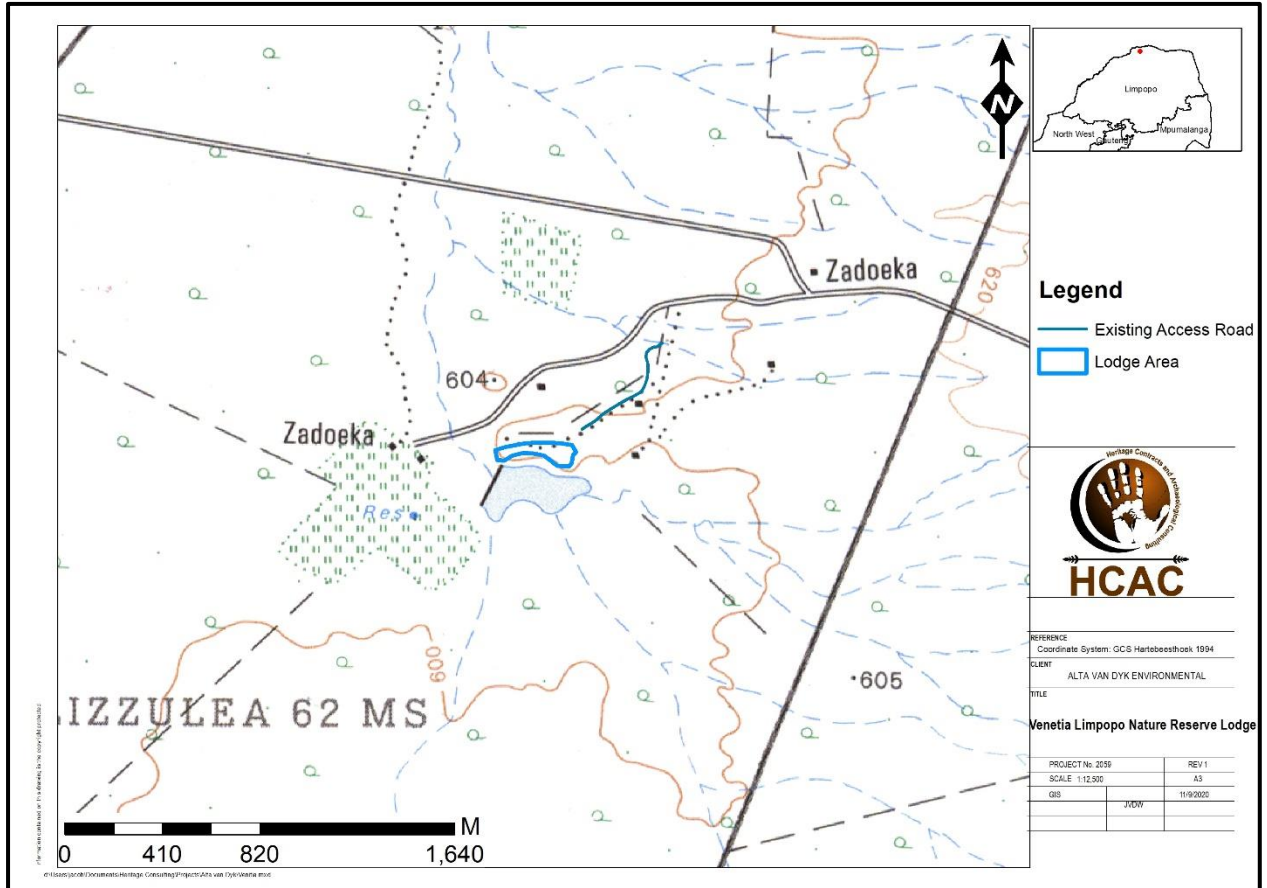


Figure 7-10. 1980 Topographical map of the study area with Lizzulea dam to the south of the study area.

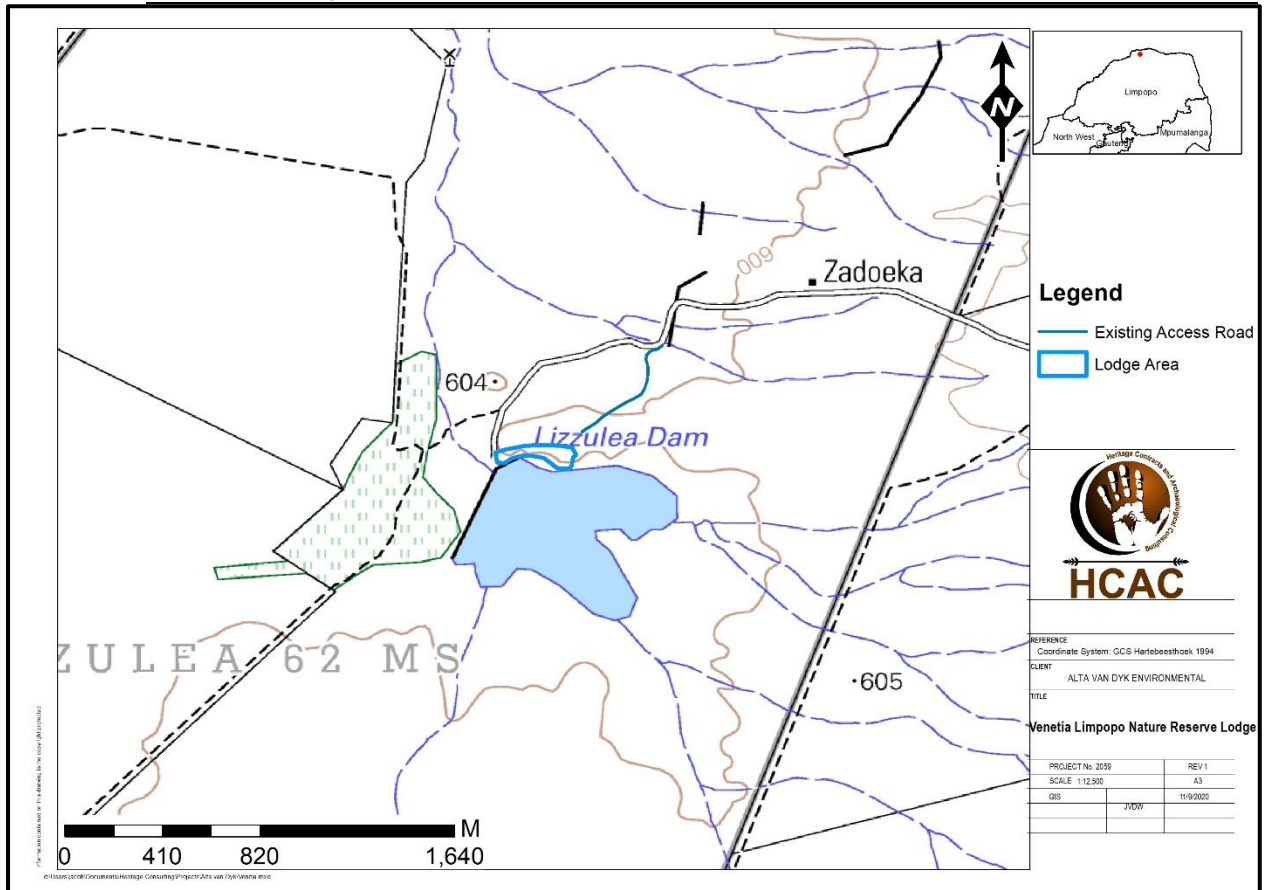


Figure 7-11. 1999 Topographical map of the study area indicating Lizzulea dam and agricultural activities.

8 Findings of the Survey

Several Iron Age sites are on record at the University of Johannesburg (Wits) database as well as the SAHRIS database (Figure 8-1) surrounding the study area. During the current assessment sites in proximity to the study area was visited and a few additional sites and features were recorded (Figure 8-2), these include Iron Age find spots, Stone Age lithics and a stone walled enclosure. Some of the sites recorded during the 2020 survey form part of the known sites recorded by Wits (Table 8.1 & Figure 8-3). Wits follows a numbering system assigned in the lab according to the topographical map number (2229 AD) and sites are then numbered numerically. The sites recorded during the current assessment are automatically assigned field waypoint numbers. Evidence of modern farming activities are visible on the hill in the form of a cement dam and earthworks possibly for laying of waterpipes but are not of heritage significance and not further mentioned in this report. The archaeological sites in proximity to the proposed development area are briefly discussed under section 8.1 of this report.

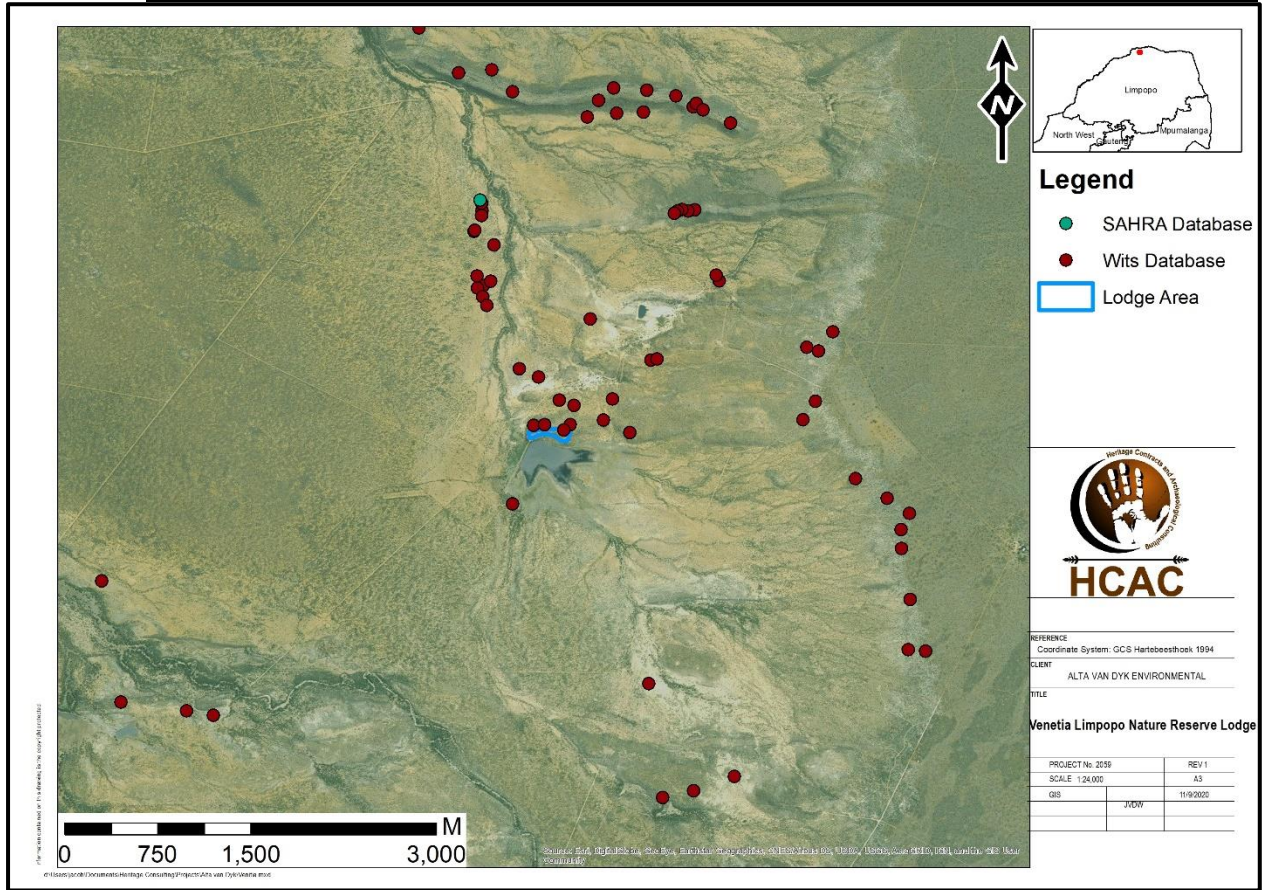


Figure 8-1: Known sites in the wider area from the Wits database and SAHRIS.

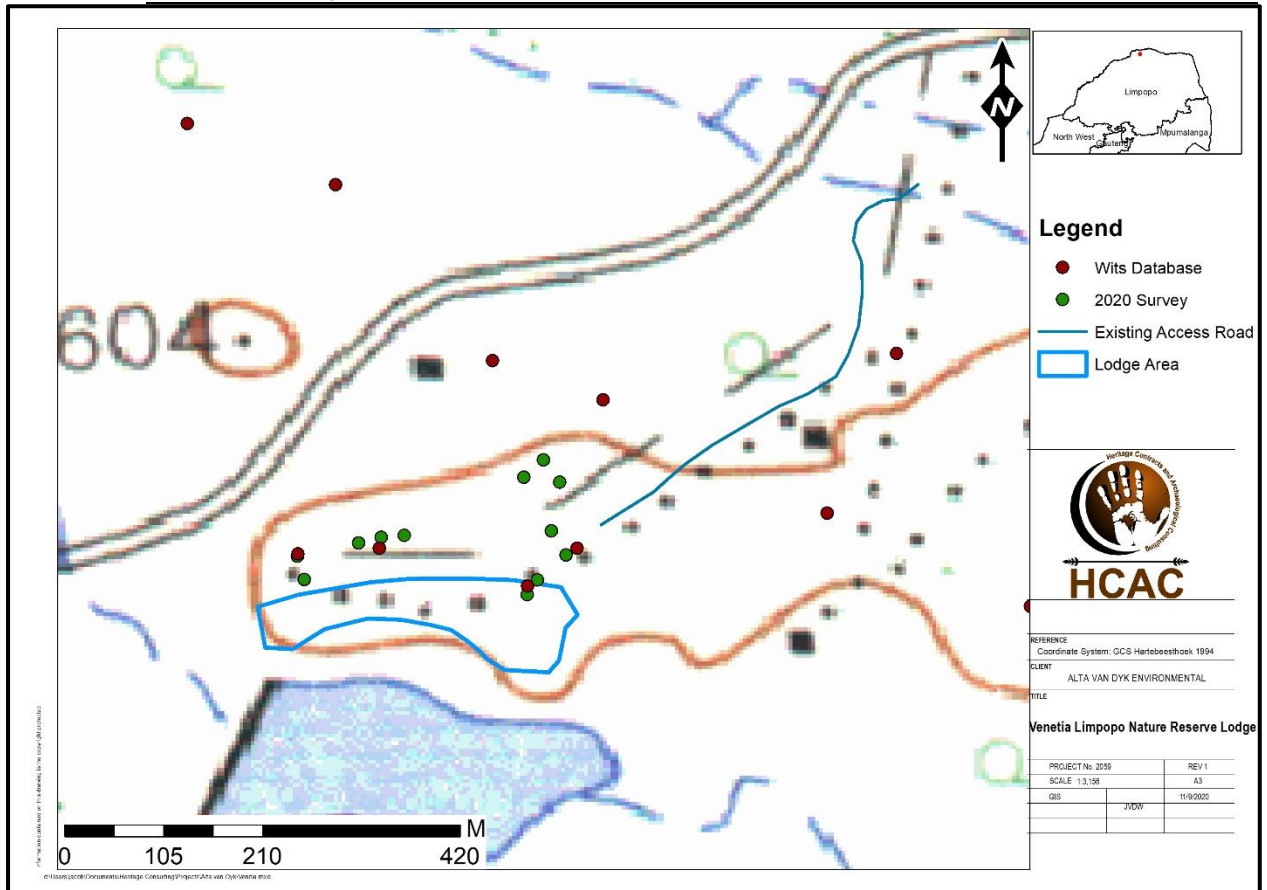


Figure 8-2. Sites and features recorded during the survey.

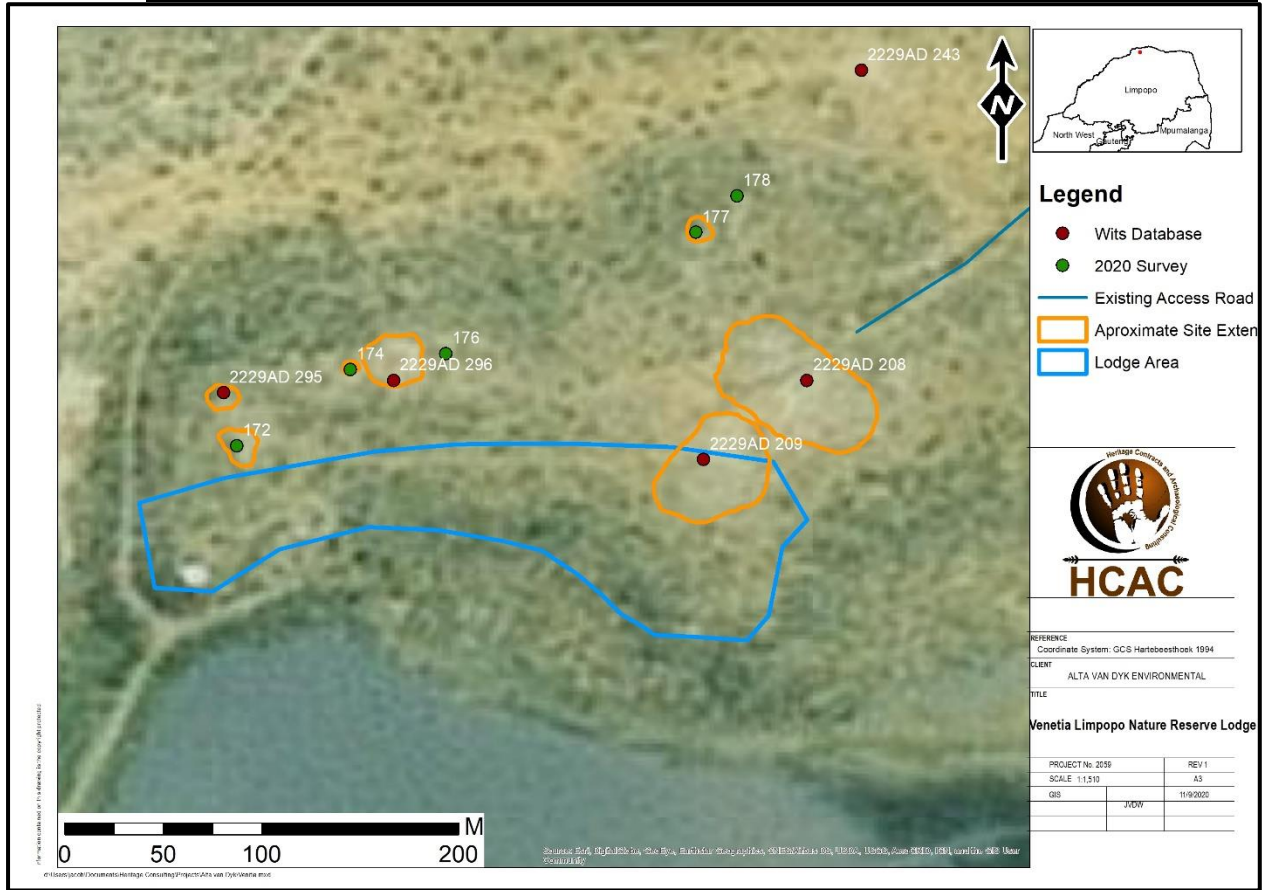


Figure 8-3. Recorded sites in relation to the study area.

Table 8-1. Sites & features recorded during the survey

Label	Longitude	Latitude	Description
172	29° 19' 41.2176" E	22° 20' 35.8727" S	Grey area (possibly ash) no diagnostic ceramics, various LSA artefacts. Possibly the southern extent of Site 2229AD 295
2229AD 295	29° 19' 41.0000" E	22° 20' 35.0000" S	Grey area (possibly ash) no diagnostic ceramics. various LSA artefacts.
174	29° 19' 43.0860" E	22° 20' 34.6201" S	Grey area (possibly ash) no diagnostic ceramics. various LSA artefacts.
2229AD 296	29° 19' 43.8000" E	22° 20' 34.8000" S	Grey are (possibly ash) with TK2 pottery and few LSA artefacts.
176	29° 19' 44.6593" E	22° 20' 34.3573" S	Bone and Ostrich Eggshell (OES) fragments, tang of spear or arrow.
177	29° 19' 48.7740" E	22° 20' 32.3628" S	Grey area (possibly ash) no diagnostic ceramics. few LSA artefacts.
178	29° 19' 49.4472" E	22° 20' 31.7617" S	Stone enclosure.
2229AD 208	29° 19' 50.6000" E	22° 20' 34.8000" S	Leokwe site with vitrified dung
2229AD 209	29° 19' 48.9000" E	22° 20' 36.1000" S	Leokwe site with vitrified dung

8.1 Archaeological Findings

8.1.1 Waypoint 172 & Site 2229AD 295

Site is marked by grey deposit (possibly ash), approximately 13 meters in diameter on the edge of the hill overlooking the surrounding area (Figure 8-3 & 8-4). Artefacts are limited to a few undecorated ceramics and LSA lithics on Crypto Crystalline Silica (CCS) with one MSA piece. LSA artefacts occur at an approximate ratio of 2 artefacts per m² and consist of flakes, chips and chunks (Figure 8-6). Only two formal pieces were recorded consisting of a broken MSA point probably reutilised during the LSA and backed blade (Figure 8-7). Site extends to edge of the hill to Site 2229AD 295 that is marked by a similar frequency of tools but on Hornfells (Figure 8-8).

HIA – VLNR Lodge

November 2020



Figure 8-4. View of the surrounding area from Waypoint 172.



Figure 8-5. Ashy area at Waypoint 172.



Figure 8-6. Dorsal and ventral views of lithics illustrating the range of raw material used at Waypoint 172.



Figure 8-7. MSA broken point on the left and LSA backed blade on the right. Recorded at Waypoint 172.



Figure 8-8. Stone Age lithics and range of raw material at Site 2229 AD 295.

Heritage Significance

This site is *in-situ* contributing to the significance of the site. The site is part of a cluster of small grey patches and of **Medium significance**.

Field Rating – GP A

8.1.2 Waypoint 174

This site is also marked by a small grey patch measuring approximately 10 meters in diameter (Figure 8-9). No ceramics were recorded here but several possibly LSA flakes (artefact ratio of 1 artefact per 2m²) were noted mostly on hornfels, although a few CCS flakes do occur.

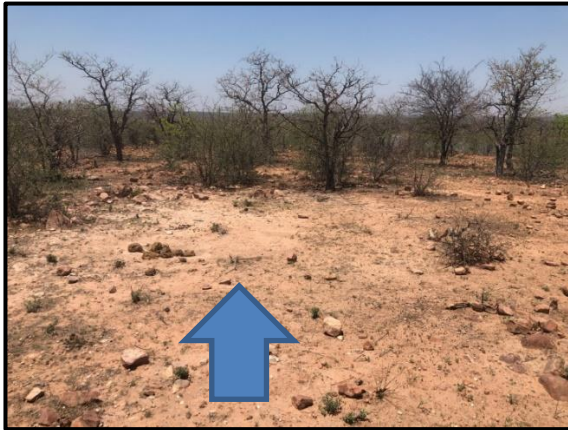


Figure 8-9. Small ashy patch at Waypoint 174



Figure 8-10. Lithics on Hornfels at Waypoint 174

Heritage Significance

This site is *in-situ* contributing to the significance of the site. The site is part of a cluster of small grey patches and of **Medium significance**.

Field Rating – GP A

8.1.3 2229AD 296

Another site marked by a grey ash patch measuring approximately 13 meter in diameter (Figure 8-11 & 8-12). Fewer artefacts are noted here although some undiagnostic ceramics were recorded here. Some bone fragments, ostrich eggshell fragments (Figure 8-14) and a few Stone Age lithics (Figure 8-15) were recorded. At 22° 20' 34.3573" S, 29° 19' 44.6593" E a tang for spear or arrow (Figure 8-16) were noted. At least one grain bin foundation (Figure 8-13) was recorded, the site was previously identified by Wits as a TK2 site.

HIA – VLNR Lodge

November 2020



Figure 8-11. Site 2229AD 296 viewed from the north.



Figure 8-12. Site 2229AD 296 viewed from the south.



Figure 8-13. Possible grain bin foundation.



Figure 8-14. Bone and ostrich egg shell fragments.



Figure 8-15. Stone Age flakes.



Figure 8-16. Undecorated ceramics and iron tang for spear or arrow.

Heritage Significance

This site is *in-situ* contributing to the significance of the site. The site is part of a cluster of small grey patches and of **Medium significance**.

Field Rating – GP A

8.1.4 Waypoint 177

This is yet another grey patch marking less than 6 meters in diameter with almost no surface artefacts.

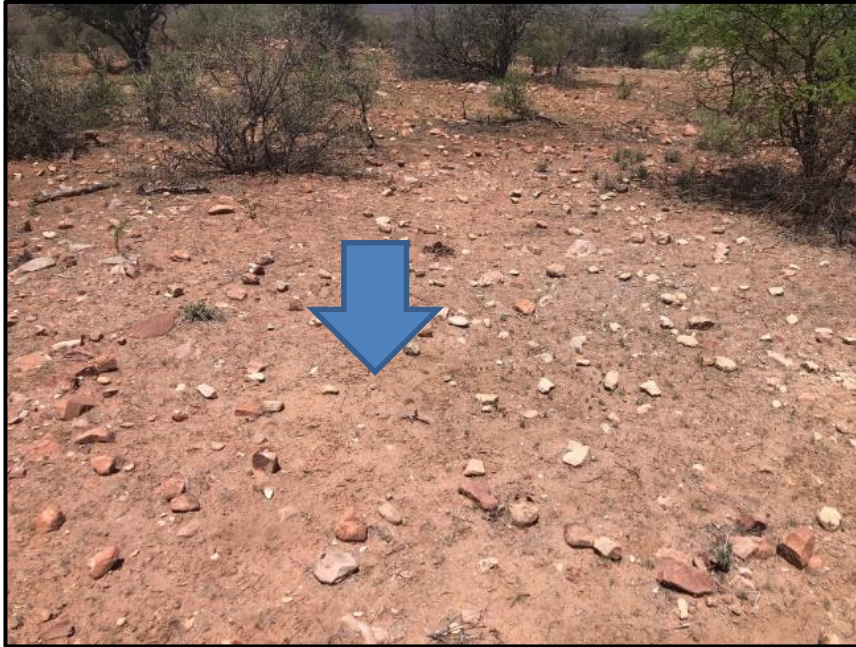


Figure 8-17. Grey patch at Waypoint 177 viewed from the south.

Heritage Significance

This site is *in-situ* contributing to the significance of the site. The site is part of a cluster of small grey patches and of **Medium significance**.

Field Rating – GP A

8.1.5 Waypoint 178

Stone enclosure with collapsed walls with an inside diameter of approximately 2.5 meter with a north facing entrance (Figure 8-18 & 8-20). An upper grinding stone was noted on the wall (Figure 8-19) with bone, shell and undecorated ceramics (Figure 8-21) on the inside of the enclosure.



Figure 8-18. Stone enclosure with entrance (blue arrow) facing north at Waypoint 178.



Figure 8-19. Upper grinding stone on wall at Waypoint 178.



Figure 8-20. Enclosure viewed from the west at Waypoint 178.



Figure 8-21. Undecorated ceramics inside enclosure at Waypoint 178.

Heritage Significance

This site is *in-situ* contributing to the significance of the site and is of **Medium significance**.

Field Rating – GP A

8.1.6 Site 2229AD 208 & 2229AD 209

This is the location of two Leokwe sites previously recorded by Wits. The sites are marked by vitrified dung deposits, ceramics and grain bin stands (Figure 8-22 to 8-26). An existing dirt road cuts through the sites and will also be used as access road to the lodge (Figure 8-27).

Heritage Significance

This site is *in-situ* with several features visible contributing to the significance of the site and is of **Medium significance**.

Field Rating – GP A

HIA – VLNR Lodge

November 2020



Figure 8-22. Site 2229AD 208 & site 2229AD 209 viewed from the north.



Figure 8-23: Grain bin stand at 2229AD 208

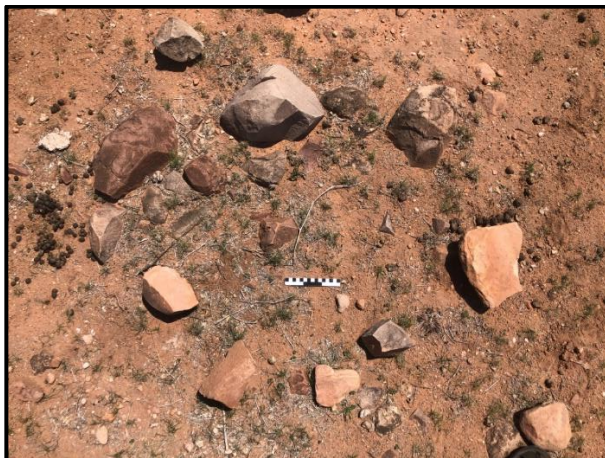


Figure 8-24: Grain bin stand at 2229AD 208.



Figure 8-25: Undecorated ceramics at 2229AD 209.



Figure 8-26: Vitrified dung at 2229AD 209

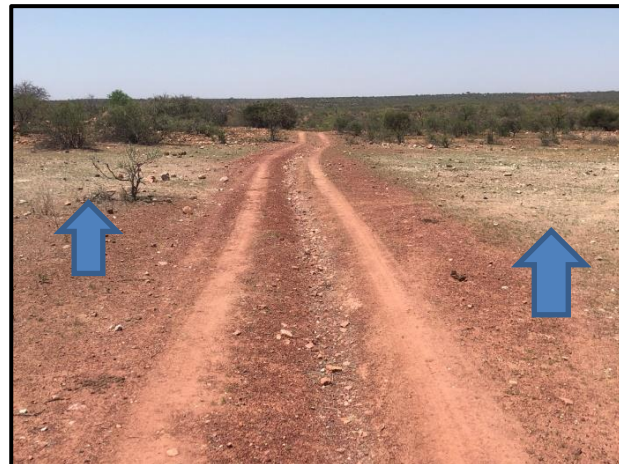


Figure 8-27: Existing access road cutting through vitrified dung deposits marking site 2229AD 208 on the right and site 2229AD 209 on the left.

8.2 Palaeontology

Based on the SAHRA Paleontological Sensitivity map the area is of moderate to high significance. An independent Palaeontological study was conducted by Marion Bamford. Bamford (2020) and indicated that the proposed site lies on the potentially fossil-rich sediments of the Karoo Supergroup, Tuli Basin formations, namely the Bosbokpoort and Clarens Formations, so a site visit was conducted. Only trace fossils of invertebrate burrows and rhizoliths were found on rock fragments, i.e. not in situ, but this indicates their presence nearby. Clarens Formation red beds were found and they should be avoided for any development if possible. Although no body fossils or plant impressions were found, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no further palaeontological site visits are required unless bones or plants are found once excavations and drilling commence. Then a palaeontologist should be called to collect a representative sample.



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required

Colour	Sensitivity	Required Action
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 8-28. Paleontological sensitivity of the study area as indicated on the SAHRA Palaeontological sensitivity map.

8.3 Graves and Burial sites

No graves or burial sites were recorded during the survey although the recorded sites are known to contain unmarked burials.

9 Potential Impact

Although the project is located within the Mapungubwe World Heritage Site buffer zone, the proposed development will not impact on the OUV of the World Heritage site. Impacts to non-renewable heritage resources will be permanent and negative and expected to occur during the vegetation clearing and initial construction and would be of medium significance but can be mitigated to an acceptable level as outlined in Table 9.1 and Section 10 of this report. The influx of people to the area is not considered to add considerably to the impact as this is a big five reserve and people would not be allowed to walk around unsupervised collecting artefacts.

The layered cultural landscape of the Mapungubwe area has many facets and projects such as this one highlights the multiple components that form part of human history in the area. The site attests to occupation from the Stone Age through to Farming community settlement and the surrounding land use to a continuation of agricultural and associated activities in modern times. Through synergy and balancing the valuable contribution of our understanding of the heritage of the area as well as the scientific contribution of the study of recorded heritage sites and the importance of projects that create employment and economic prosperity in the area, projects such as these enhance the cultural landscape. The long-term impact on the cultural landscape can be mitigated to an acceptable level with the correct mitigation measures in place. Visual impacts to scenic routes and sense of place are also considered to be low as the proposed project is in line with the current land use.

Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of the development, impacts can be mitigated to an acceptable level. The VLNR has created a viable conservation buffer through the establishment of the reserve that contribute to the preservation of cultural resources in the area. The reserve, which now forms part of the MCLWHS buffer zone, has always added extra protection to cultural heritage sites around the core of the listed property and the construction of the Lodge will not have a high negative impact on this.

Table 9-1. Significance and proposed mitigation of heritage sites

LABEL	Significance	Mitigation
172	Medium	No direct impact. Preserve <i>in situ</i>
2229AD 295	Medium	No direct impact. Preserve <i>in situ</i>
174	Medium	No direct impact. Preserve <i>in situ</i>
2229AD 296	Medium	No direct impact. Preserve <i>in situ</i>
176	Medium	No direct impact. Preserve <i>in situ</i>
177	Medium	No direct impact. Preserve <i>in situ</i>
178	Medium	No direct impact. Preserve <i>in situ</i>
2229AD 208	Medium	No direct impact by the lodge therefore preserve <i>in situ</i> . As the impact to the Leokwe sites (Site 2229AD 208 & 2229AD 209) has already occurred the continued use of the existing access road subject to a Section 35 permit as well as a management plan is recommended. There is no design report for the road but the intact deposit can be sealed by paving the area and including the management of stormwater and erosion in the site management plan.
2229AD 209	Medium	The site is located on the periphery of the proposed impact area and it is recommended that the site should be preserved <i>in situ</i> . As the impact to the Leokwe sites (Site 2229AD 208 & 2229AD 209) has already occurred the continued use of the existing access road subject to a Section 35 permit as well as a management plan is recommended. There is no design report for the road but the intact deposit can be sealed by paving the area and including the management of stormwater and erosion in the site management plan.

9.1 Impact Assessment – World Heritage Site (ICOMOS)

The proposed project will not impact on any of the heritage attributes of the Mapungubwe WH property. Although the development area is in proximity to cultural heritage sites of medium significance (Figure 9-1) the impacts on these sites can be mitigated to an acceptable level. Following the ICOMOS Impact Assessment rating for WHS the impact of the proposed development on the WH property with the implementation of the mitigation measures as recommended in this report is neutral/ slight (Table 9-2).

Table 9-2. ICOMOS System for assessing/ evaluating Impact.

VALUE OF HERITAGE ASSET	SCALE & SEVERITY OF CHANGE/IMPACT				
	Neutral	Slight	Moderate/ Large	Large/ Very Large	Very Large
For WH properties Very High – attributes which Convey OUV	SIGNIFICANCE OF EFFECT OR OVERALL IMPACT (EITHER ADVERSE OR BENEFICIAL)				
	Neutral	Slight	Moderate/ Large	Large/ Very Large	Very Large
FOR OTHER HERITAGE ASSETS OR ATTRIBUTES	SIGNIFICANCE OF IMPACT (EITHER ADVERSE OR BENEFICIAL)				
Very High	Neutral	Slight	Moderate/ Large	Large/ Very Large	Very Large
High	Neutral	Slight	Moderate/ Slight	Moderate/ Large	Large/ Very Large
Medium	Neutral	Neutral/Slight VLNR	Slight	Moderate	Moderate/ Large
Low	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Slight/ Moderate
Negligible	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight

HIA – VLNR Lodge

November 2020

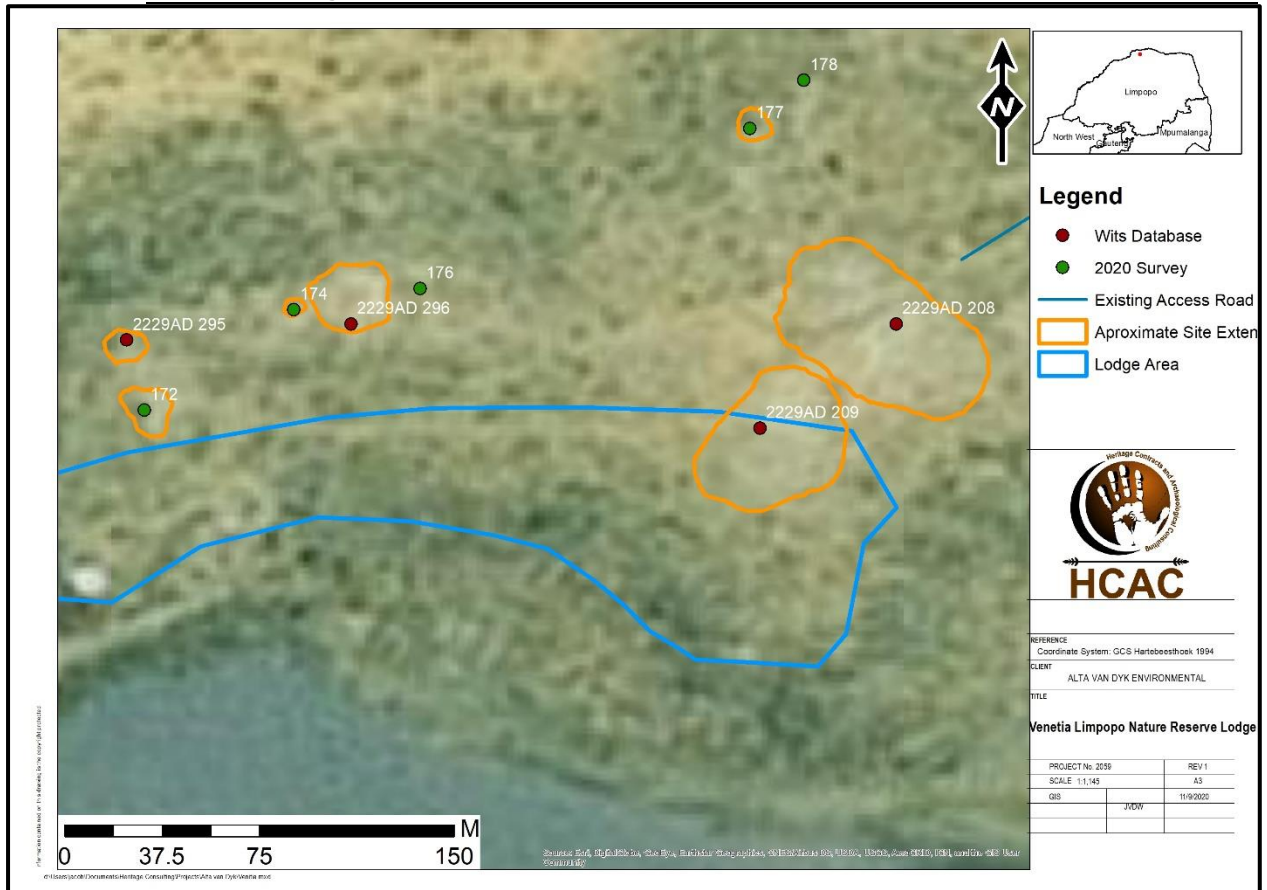


Figure 9-1. Recorded heritage features and extent of the sites in relation to the impact area.

9.2 Impact Assessment – Department of Environmental Affairs.

The significance of the identified impacts is determined by using the accepted methodology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998 as provided by the EAP.

Table 9-3. Impact Assessment

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		M	D	S	I	R	P	TOTAL	SP				M	D	S	I	R	P	TOTAL	SP
Cultural Heritage Impact Assessment																				
Archaeological Resources - Iron Age sites	Construction of the VLNR Lodge	4	5	3	5	5	3	66	M	Low	Negative	<ul style="list-style-type: none"> It is recommended that the recorded sites 172, 2229AD 295, 174, 2229AD 296, 176, 177, 178, 2229AD 208, 2229AD 209 should be retained in situ, if this is not possible the sites should be subjected to Phase 2 Mitigation; Rerouting of the existing access road and rehabilitation of the current access road is a mitigation option but will potentially impact on other sites and is therefore not the preferred option. A better alternative will be to use the existing road as the impact has already occurred and to minimise further impact to the site. This will be subjected to a Section 35 permit as well as a 	4	5	3	0	0	3	36	L

10 Conclusion and recommendations

The proposed VLNR lodge development is located to the south of the Limpopo floodplain on a small sandstone hill providing vistas of the surrounding landscape with Lizzulea dam to the south of the hill. Evidence of modern farming activities are visible on the hill in the form of a cement dam and earthworks possibly for laying of waterpipes but are not of heritage significance and not further mentioned in this report.

Several Iron Age sites are on record at the University of Johannesburg (Wits) database as well as the SAHRIS database (Figure 8-1) surrounding the study area. During the current assessment sites from these databases in proximity to the study area was revisited and a few additional sites and features were recorded (Figure 8-2), these include Iron Age find spots, Stone Age lithics and a stone walled enclosure. Iron Age/farming community sites dating to the Leokwe *facies* (1010 – 1160 AD) occur within but mostly adjacent to the study area with a TK2 Iron Age site (1200 – 1250 AD) also located outside of the development footprint. Small grey patches (possibly ash from middens) are found along the northern edge of the hill often with LSA lithics. Based on the current surface observations the relationship between the LSA material and middens is not clear. These sites are all well preserved with minimal impact to the Leokwe sites (2229AD 208 & 2229AD 209) from the existing access road.

The study area is indicated as very sensitive on the SAHRIS paleontological map and an independent study was conducted (Bamford 2020). During the field survey no body fossils were recorded, only isolated rock fragments with trace fossils;

The study area is located within the Mapungubwe World Heritage Site (WHS) buffer zone but will not negatively impact on the Outstanding Universal Value (OUV) of the site. The impact of the project on heritage resources can be mitigated to an acceptable level and it is recommended that the proposed project is approved on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- It is recommended that the recorded sites Waypoint 172, 2229AD 295, Waypoint 174, 2229AD 296, Waypoint 176, 177, 178, 2229AD 208 and 2229AD 209 should be retained *in situ*.
- Rerouting of the existing access road and rehabilitation of the current access road is a mitigation option but will potentially impact on other sites and is therefore not the preferred option. A better alternative will be to use the existing road as the impact has already occurred and to minimise further impact to the site. This will be subjected to a Section 35 permit as well as a management plan. There is no design report for the road but the intact deposit can be sealed by paving the area and including the management of stormwater and erosion in the site management plan.;
- Recorded heritage resources should be indicated on development maps and infrastructure should be located away from these areas.
- Implementation of a heritage site development plan for the project; and
- Implementation of a chance find procedure for the project (archaeology and palaeontology) as outlined below.

10.1. Chance Find Procedures - Heritage Resources

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

Chance find protocol and Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when excavations/drilling commence.
2. When excavations begin the rocks must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the construction activities will not be interrupted.
3. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figures 8-10). This information should be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further is required.

10.2. Reasoned Opinion

The impact of the proposed project on heritage resources can be mitigated to an acceptable level based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

10.3. Potential risk

Potential risks to the proposed project are the occurrence of unknown or unmarked graves of which surface indicators have been destroyed and subsurface archaeological deposits. These risks can be mitigated to an acceptable level with monitoring and the implementation of a chance find procedure as outlined in Section 10.1.

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12 Appendices:**Curriculum Vitae of Specialist**

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Name of University or Institution: University of Pretoria
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Degree obtained : BA Hons Archaeology
Year of graduation : 2002

Name of University or Institution : University of the Witwatersrand
Degree Obtained : MA (Archaeology)
Year of Graduation : 2012

Name of University or Institution : University of Johannesburg
Degree : PhD
Year : Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present: **Owner – HCAC (Heritage Contracts and Archaeological Consulting CC).**
2007 – 2010 : **CRM Archaeologist**, Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007: **CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004: **Technical Assistant**, Department of Anatomy University of Pretoria
2003: **Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002: **CRM Archaeologists**, For R & R Cultural Resource Consultants, Polokwane
2000: **Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:**Archaeological Impact Assessments (Phase 1)**

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chlookop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booyendal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159
Accreditation:
 - Field Director Iron Age Archaeology
 - Field Supervisor Colonial Period Archaeology, Stone Age
 Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
 - J van der Walt, A Meyer, WC Nienaber
 - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
 - WC Nienaber, M Hutten, S Gaigher, J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
 - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
 - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
 - J van der Walt, P Birkholtz, W. Fourie
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic
- J]nalysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.

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- J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008
- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep*)
 - J van der Walt and J.P Celliers
 - Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
 - Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
 - Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
 - Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
 - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

1. Prof Marlize Lombard Senior Lecturer, University of Johannesburg, South Africa
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University of the Witwatersrand
3. Alex Schoeman University of the Witwatersrand
E-mail: Alex.Schoeman@wits.ac.za