HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED VODACOM MAST – NGA REMHOOGTE LODGE, NORTH WEST PROVINCE

Type of development:

Vodacom Mast

Client:

Tekplan Environmental Consultants

Client info:

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Developer:

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Project Reference:
HCAC Project number 2003
Report date:
January 2020

APPROVAL PAGE

Project Name	**Vodacom Mast – NGA Remhoogte Lodge**
Report Title	Heritage Impact Assessment Vodacom Mast – NGA Remhoogte Lodge
Authority Reference Number	SAHRA Case Number 14476
Report Status	Draft Report
Applicant Name	Vodacom

	Name	**Qualifications and Certifications**	**Date**
Archaeologist	Jaco van der Walt	MA Archaeology ASAPA #159	Jan 2020
Palaeontology	Prof Marion Bamford	B.Sc. Geology (Hons), Ph.D. Geology,	Jan 2020

DOCUMENT PROGRESS

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Amendments on Document

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 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	*Declaration of Independence*
(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
(I) 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 BA report
(q) Any other information requested by the competent authority	Section 11

Executive Summary

Tekplan Environmental was appointed by Vodacom to conduct an Environmental Authorisation (EA) Applications process for a proposed telecommunications mast located in the Remhoogte area on the Remainder of the farm Remhoogte 476 JQ in the Madibeng Local Municipality area, Bojanala Platinum District Municipality, North West Province. HCAC was appointed to conduct a Heritage Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. Two alternatives were assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the mast footprint. The project footprint is small measuring approximately 8m x 10m in extent. The mast will be a lattice mast measuring approximately 25 meters in height.

In terms of the built environment of the area (Section 34 of the NHRA Act 25 of 1999), no standing structures older than 60 years occur within the impact areas. However, the remains of the foundations of a demolished structure were noted 20 meters to the south of the preferred alternative. The ruin has been completely destroyed and is not indicated on historical maps of the area. The structures' potential to contribute to aesthetic, historic, scientific and social aspects are non-existent and it is therefore of no heritage significance. The feature will also not be directly impacted on.

Regarding the archaeological component of Section 35, isolated scatters of undecorated ceramics were recorded outside of the impact areas, washing down from an elevated area to the north of both the alternatives. These undecorated ceramics are washing down in the access road where sheet erosion is prevalent. No other features like middens or stone walls are found in association with the ceramics, these ceramic find spots are out of context and therefore of no heritage significance.

In terms of the palaeontological component an independent paleontological study was conducted by Prof Marion Bamford (2020) and concluded that, based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the Silverton Formation or the nearby soils of the Quaternary underlying the study area. There is very small chance that trace fossils may occur in the Silverton Formation and a Fossil Chance Find Protocol is recommended as part of the EMPr:

The proposed mast is located well outside of the boundaries of the Cradle of Humankind (CoH) World Heritage Site and several other telecommunication masts occur in the area. We are of the opinion that the project will have no impact on the larger CoHWHS and on a local scale no impact is foreseen on the cultural landscape. During the public participation process conducted for the project no heritage concerns were raised.

With the correct mitigation measures the impact of both alternatives on heritage resources is considered acceptable and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Archaeological monitoring of the site during earthworks;
- Implementation of a chance finds procedure (Archaeological and Palaeontological) as a condition of the EMPr.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	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: • 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	20/01/2020

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 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 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

LIST OF FIGURES

LIST OF TABLES

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:

Heritage Contracts and Archaeological Consulting CC (**HCAC)** has been contracted by Tekplan Environmental Consultants to conduct a heritage impact assessment of the proposed Remhoogte Vodacom Mast Development. The proposed development site is located in the Remhoogte area on the Remainder of the farm Remhoogte 476 JQ in the Madibeng Local Municipality area, Bojanala Platinum District Municipality, North West Province. (Figure 1 -3). The report forms part of the Basic Assessment (BA) and Environmental Management Programme Report (EMPr) for the development.

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, the foundations of a demolished structure and ceramic scatter were identified outside of the impact area. 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 EMPr, 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).

Table 2: Project Description

Size of farm and portions	The Remainder of the farm Remhoogte 476 JQ.
Magisterial District	Madibeng Local Municipality area, Bojanala Platinum District Municipality,
1: 50 000 map sheet number	2527DC
Central co-ordinate of the development	25°47'18.91"S 27°43'58.89"E

Table 3: Infrastructure and project activities

Type of development	Vodacom Telecommunications Mast
Project size	8m x 10 m impact area for a 25-meter lattice mast
Project Components	A container housing electronic equipment surrounded by a steel palisade fence

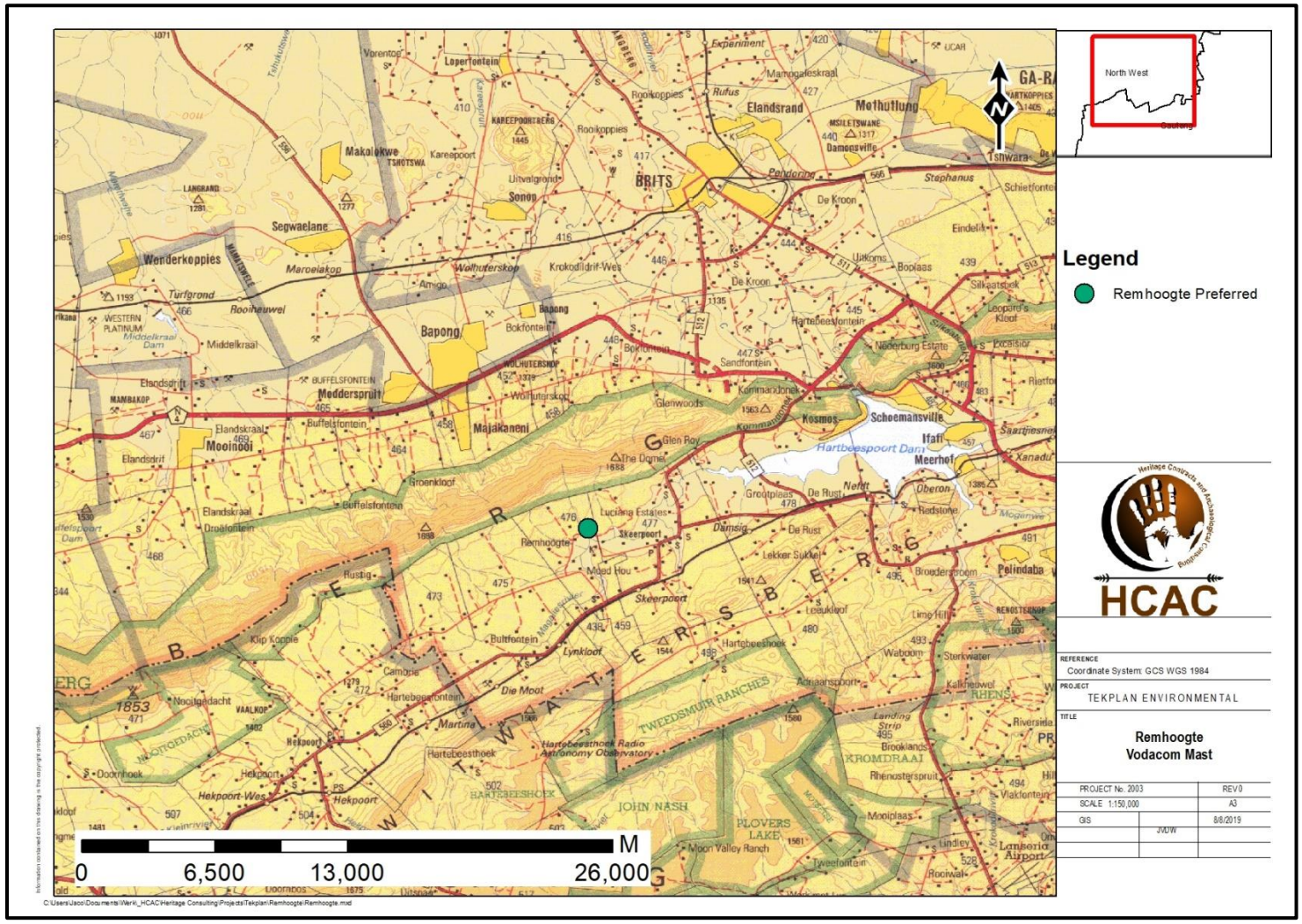

Figure 1. Provincial locality map (1: 250 000 topographical map).

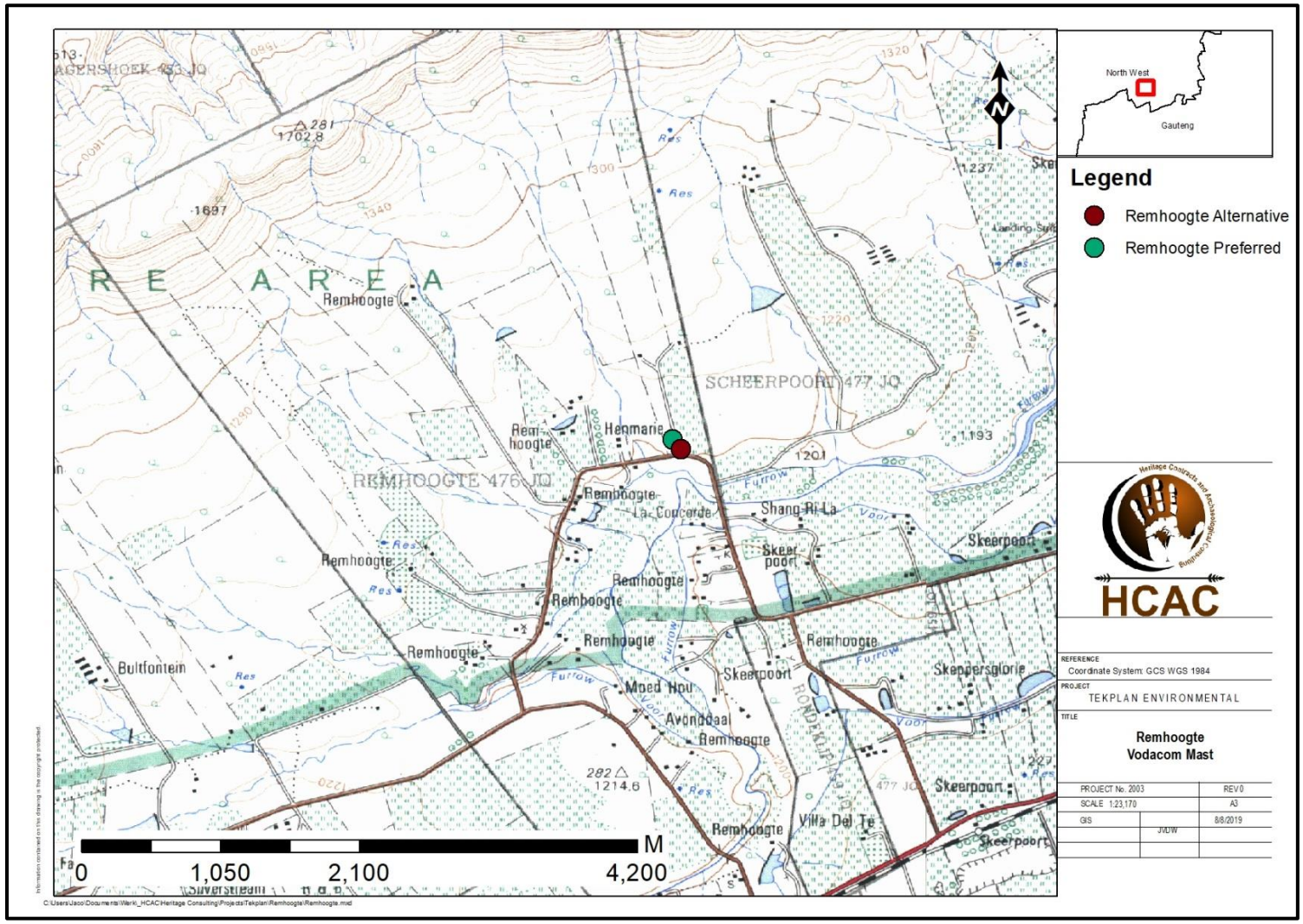

Figure 2: Regional locality map of the two alternatives (1:50 000 topographical map).

Figure 3. Satellite image of the two alternatives (Google Earth 2019).

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)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

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).

As the site is located outside and to the north of the boundaries of a World Heritage Site, the following additional legislation should also be noted:

- National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEM: PAA)
  The NEM: PPA provides for South Africa's system of protected areas. It establishes the mechanisms for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes. It makes further provisions for intergovernmental co-operation and public consultation in matters concerning protected areas to promote the continued existence, governance and functions of the National Parks.

- GN 1356: NEM: PAA Cultural Heritage Survey Guidelines and Assessment Tools for Protected Areas in South Africa promulgated on 8 December 2017:
  The guidelines enable managers of Protected Areas to work within the ambit of the national HRM system in a quest of continuous improvement and sustainable management of heritage resources. It establishes best practice standards to effectively:
  - Support the implementation of the NHRA in the identification and protection of places of CS in Protected Areas;
  - Provide the basic means of ensuring those who manage Protected areas:
    - Are aware of the heritage resources within their Protected Area;
    - Have knowledge of the CS of these identified heritage resources within the Protected Area;
    - Have the knowledge to conduct basic recording of heritage resources in the Protected Area; and
  - Fulfil the basic requirements of the NHRA and other applicable legislation.

- World Heritage Convention Act, 1999 (Act No. 49 of 1999) (WHCA)

The WHCA makes provision for the inclusion of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) Convention concerning the Protection of the World Cultural and Natural Heritage (i.e. World Heritage Convention [WHC]) of 1972, into South African law.

- International Council on Monuments and Sites (ICOMOS): Charter for the Protection and Management of the Archaeological Heritage, 1990
  The Charter provides for the protection and proper management of archaeological heritage to enable archaeologists and other scholars an opportunity to study and interpret these resources on behalf of and for the benefit of present and future generations, through effective collaboration between professionals from several disciplines and local cultural groups.

  The Charter reflects the basic principles and guidelines for global validity as follows:
  - Article 2: Integrated Protection Policies;
  - Article 3: Legislation and Economy;
  - Article 4: Survey;
  - Article 5: Investigation;
  - Article 6: Maintenance and Conservation;
  - Article 7: Presentation, Information and Reconstruction; and
  - Article 8: Professional Qualifications.

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 Basic Assessment Report (BAR).

Please refer to section 6 for more detail.

3.4 Site Investigation

Conduct a field study 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 4: Site Investigation Details

	Site Investigation
Date	15 January 2020
Season	Summer – vegetation in the study area is low with good archaeological visibility. The impact area was sufficiently covered (Figure 4) to record the presence of heritage resources adequately.

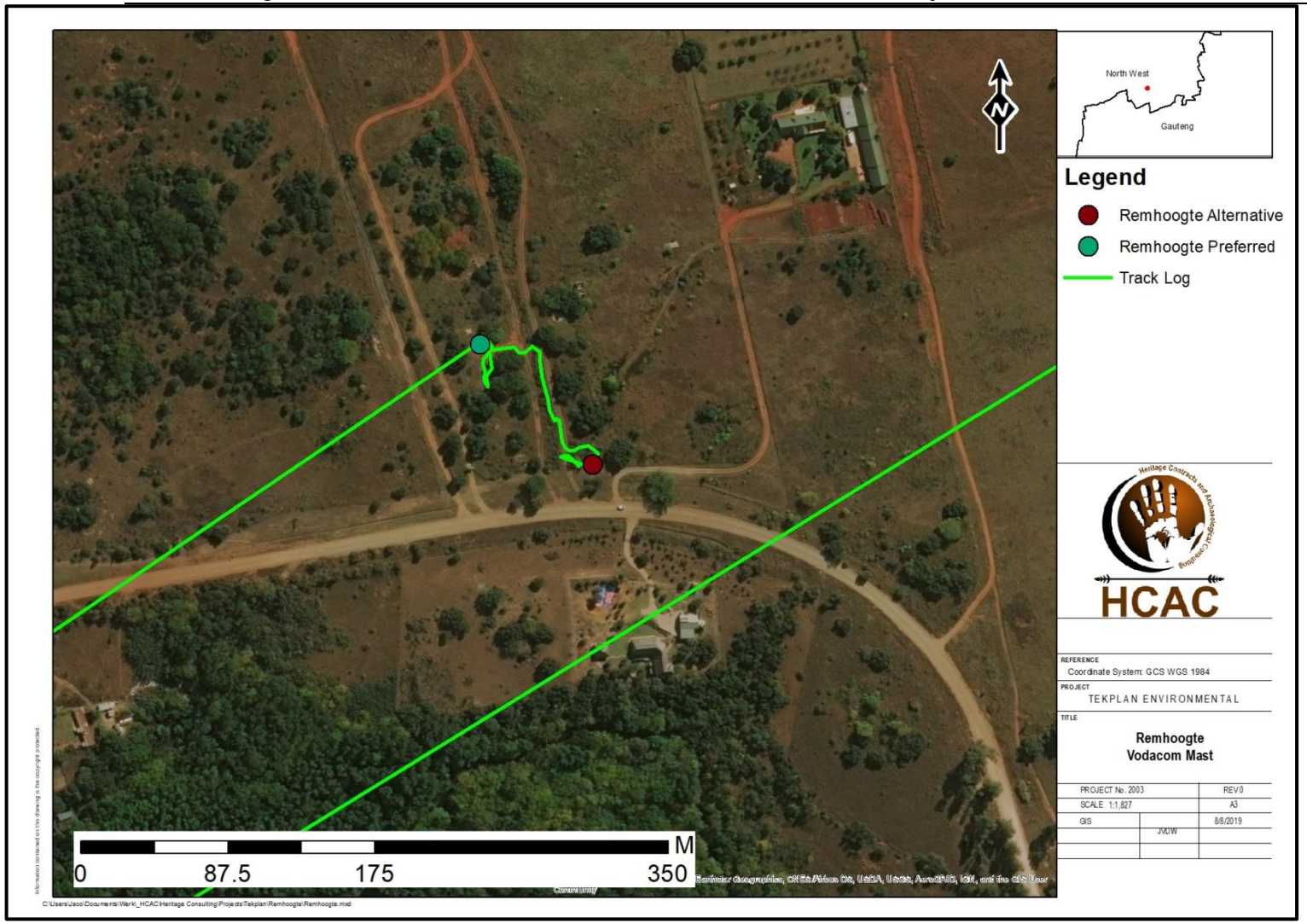

Figure 4: Track log of the survey in green with the preferred mast indicated by the green dot and the alternative indicated by the red dot.

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 criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
  - medium-term (5-15 years), assigned a score of 3;
  - long term (> 15 years), assigned a score of 4; or
  - permanent, assigned a score of 5;
  - The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
  - The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
  - The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
  - the **status**, which will be described as either positive, negative or neutral.
  - the degree to which the impact can be reversed.
  - the degree to which the impact may cause irreplaceable loss of resources.
  - the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:
S=(E+D+M) P
S = Significance weighting
E = Extent

D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

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, 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. 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 Local Municipality of Madibeng has a total population of 477 381. It is highly rural, with 57% of its population residing in rural areas (tribal or traditional areas), about 28% residing in urban areas and about 15% residing in farming areas. Black Africans are the majority, with an 89% share of the Madibeng Municipality's population. The most commonly spoken language is Setswana.

More than half of the population is male (53%), with 47% constituting females. At age 85 and older, there were more than twice as many women as men. People under 20 years of age made up over a quarter of the population (33,5%), and people aged 65 and older made up 5% of the population.

Madibeng prides itself on a number of economic activities which play a significant role in the growth of the province and country as a whole, and which include agriculture, mining, tourism and manufacturing. Mining is presently predominant with Madibeng being the world's third-largest chrome producer and includes the richest Platinum Group Metals Reserve (situated on the Merensky Reef). Manufacturing is also a dominant sector with a wide variety of industries situated in the various industrial areas. Tourism is one of the strong contenders, if well explored in the area. The possible establishment of the tourism belt is being researched for economic expansion. The advantage of rail and road infrastructure spanning in all lucrative destinations will begin to bear necessary fruit for the prosperity of the people of Madibeng.
The municipality is characterised by high levels of unemployment. In Madibeng, the unemployment rate for those aged 15 to 24 is 38,2%, which is almost 10% more than the overall unemployment rate.

5 Description of the Physical Environment:

The proposed site earmarked for the Vodacom mast measures 8 x 10 meter. The proposed development site is located in the Remhoogte area on the Remainder of the farm Remhoogte 476 JQ, North West Province**.** The area earmarked for the proposed mast is generally flat and has been fallow for a number of years. Historical maps indicate that the surrounding area has been cultivated in the past (Figure 6,7, 8).

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.

7 Literature / Background Study:

7.1 Literature Review (SAHRIS)

The following reports were conducted in the vicinity of the study area and were consulted for this report:

Author	Year	Project	Findings
Van Schalkwyk, J.	1997	A Survey of Cultural Resources in The Proposed De Rust Development Area, Northwest Province	Stone Tools and Iron Age site.
Van Schalkwyk, J.	1998	A Survey of Cultural Resources for The Lomond/ Scheerpoort Powerline, Broederstroom Area, West of Pretoria	No sites
Van der Walt, J & Fourie, W.	2007	Archaeological Impact Assessment Remainder of Portion 25 of the farm Welgegund 491 JQ, Hartbeespoort, Gauteng Province	No sites
Kusel, U.	2007	Cultural Heritage Resources Impact Assessment of Portion 92 De Rust 478 JQ Madibeng North West Province	No sites
Birkholtz, P.	2008	Phase 1 Heritage Impact Assessment Proposed Development of Portion 53 of the Farm Remhoogte 476-JQ, Madibeng Municipality, North-West Province	No sites
Birkholtz, P.	2008	Phase 1 Heritage Impact Assessment Proposed Sondela Residential Development on Portions 14 & 25 Of the Farm Rietfontein 485-Jq, Madibeng Local Municipality & The Bojanala Platinum District Municipality's Area of Jurisdiction, North West Province	No sites
Van der Walt. J.	2016	Archaeological Impact Assessment – Kalkheuvel	Modern Dwellings
Van Vollenhoven, A.	2018	Letter for HIA exemption request: proposed rehabilitation of road P31/1 (R104), North West Province	No sites
Van der Walt, J.	2018	Heritage Impact Assessment Leeuwenkloof Vodacom Mast	No sites
Van der Walt, J.	2019	Heritage Impact Assessment Guinea Fowl Vodacom Mast	Stone Age sites

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

7.2 Background to the general area

The fossil Hominid sites of Sterkfontein, Swartkrans, Kromdraai, and Environs were named a UNESCO World Heritage site in 1999 (Figure 5). More commonly known as the Cradle of Humankind (hereafter CoH), the area is a geological outcropping of the Malmani Dolomites (see Herries et al., 2009; Dirks & Berger, 2013) that preserve the fossil remains of distant human ancestors, as well as those of a prolific array of fauna. The COH is approximately 50 minutes' drive outside of Johannesburg. The cave sites in the area range in age from as early as 4.5Ma (Waypoint 160, Bolts Farm, Gommery et al., 2008) to as recent as 70Ka (e.g. Plovers Lake; Thackeray and Watson, 1994; Herries et al., 2009). Further, there are a number of modern human archaeological sites that overlay the dolomites due to the high occurrence of raw materials such as chert, quartzite, and quarts in the area (see Mason, 1951). These surface deposits have largely been overlooked in comparison to the Plio-Pleistocene fossil deposits.

The CoH gains Outstanding Universal Value (OUV) due to its' abundance of hominin fossil (human ancestors) remains from three genera: *Australopithecus*, *Homo* and *Paranthropus*. Alongside the human ancestors we find stone tools ranging from the Oldowan through to the Later Stone Age, as well as bone tools. Other than the hominin material, there are innumerable faunal fossils including the giant baboon *Dinopithecus* (Gilbert, 2007) and the false sabre-toothed cat *Dinofelis* (Werdelin & Lewis, 2001). The CoH is located well to the south of the study area and will not be impacted on by the proposed mast.

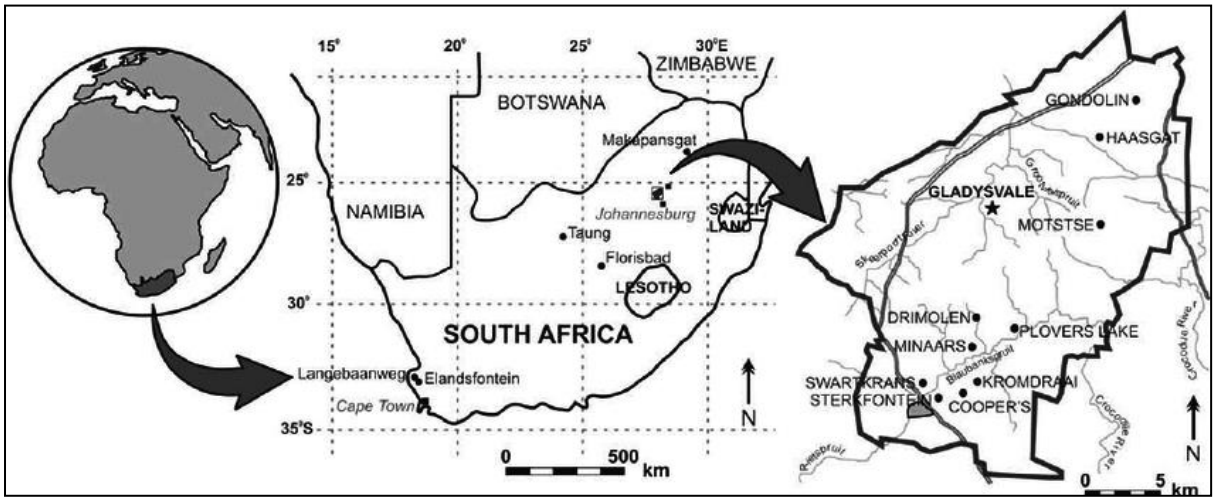

Figure 5. A map showing the Cradle of Humankind with the bulk of the fossil assemblages as per the UNESCO World Heritage listing of 1999 (image from Backwell et al., 2009).

7.2.1 Archaeology of the greater study area

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

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, the Middle Stone Age and the Earlier Stone Age. 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 ESA is represented in the area by the Wonderboom site on the southern slopes of the Magaliesberg north of Pretoria. This site is characterised by numerous cleavers, hand axes, cores and flakes (Mason, 1958). The nearby Jubilee shelter has been excavated and provides a record from the Late Pleistocene to the 7th Century AD (Turner, 1986), an extended cultural sequence with assemblages' characteristic of the Middle Stone Age, Early Later Stone Age and Later Stone Age including assemblages from the Oakhurst and Wilton industries (Wadley, 1986). The Jubilee shelter provides evidence of hunter–gatherer occupation during three phases of agro pastoralist contact, beginning in 225 AD and characterised by cooperative contact, prior to the hunter-gatherers being either assimilated or dispersed to other areas (Wadley, 1996).

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. It can be divided into three distinct periods:

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

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. The Broederstroom Early Iron Age site is located to the south westeast of the study area and consist of around 250 years of occupation by iron and copper producers (Mason, 1981) and provided evidence on the role of cattle and the central cattle pattern in spatial arrangement of Early Iron Age sites (Huffman 1993). The copper smelting sites (Middle Iron Age) at Uitkomst and Ifafa from the 15th/16th Centuries were described by Mason (1962). The Late Iron Age in the area is characterised by extensive stone walled sites (Mason, 1986; Dreyer, 1995) of the Sotho-Tswana (Pistorius 1992). Rock engravings from the Magaliesberg include depictions of animals, shields, animal pens and settlements and are attributed to the Tswana people who occupied the area (Mason, 1986; Maggs, 1995).

7.2.2 Historical Information

The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's. (Bergh 1999: 10) It came about in response to heightened competition for land and trade and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. (Bergh: 14; 116-119) In 1825 as a result of the Mfecane Mzilikazi of the Matabeles conquered the area and displaced the Tswana tribes that used to live in the area. Mzilikazi established his kraal north of the Magaliesberg in the vicinity of the present day Hartbeespoort Dam. (Steyn et al, 1978).

Broederstroom was founded in 1903 with the opening of a trading post in the area. The history of this area is mainly nestled in farming and commercial activities and this is emphasized by important 19th and early 20th century farm and store buildings located in this area (Marais –Botes 2011).

7.2.3 Anglo-Boer War

The Anglo-Boer War, which took place between 1899 and 1902 in South Africa, was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and as a consequence, republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was; however, a clear statement of British war aims. (Du Preez 1977). No battles occurred in the study area but one battalion of British troops moved through Rustenburg between February and September 1900. This was the regiment of General Major R. S. S. Baden-Powell. The Boer war-hero General Jacobus Herculaas de la Rey (more commonly known as Koos de la Rey) also moved past Rustenburg on his route between Barberton and Lichtenburg. (Bergh 1999: 51). The Battle of Kalkheuvel Pass took place in the area on 3 June 1900. The battle can be described as forming part of the bigger onslaught on Pretoria. At Roodewal Genl French's forces were attached by Boer Forces, leaving numerous men wounded and dead on both sides (Copley 1993).

7.2.4 Cultural Landscape

The site under investigation is located south west of Hartbeespoort Dam in the North West Province. The area was mainly used for cultivation in the past and is currently used as a lodge and not cultivated (Figure 6-8).

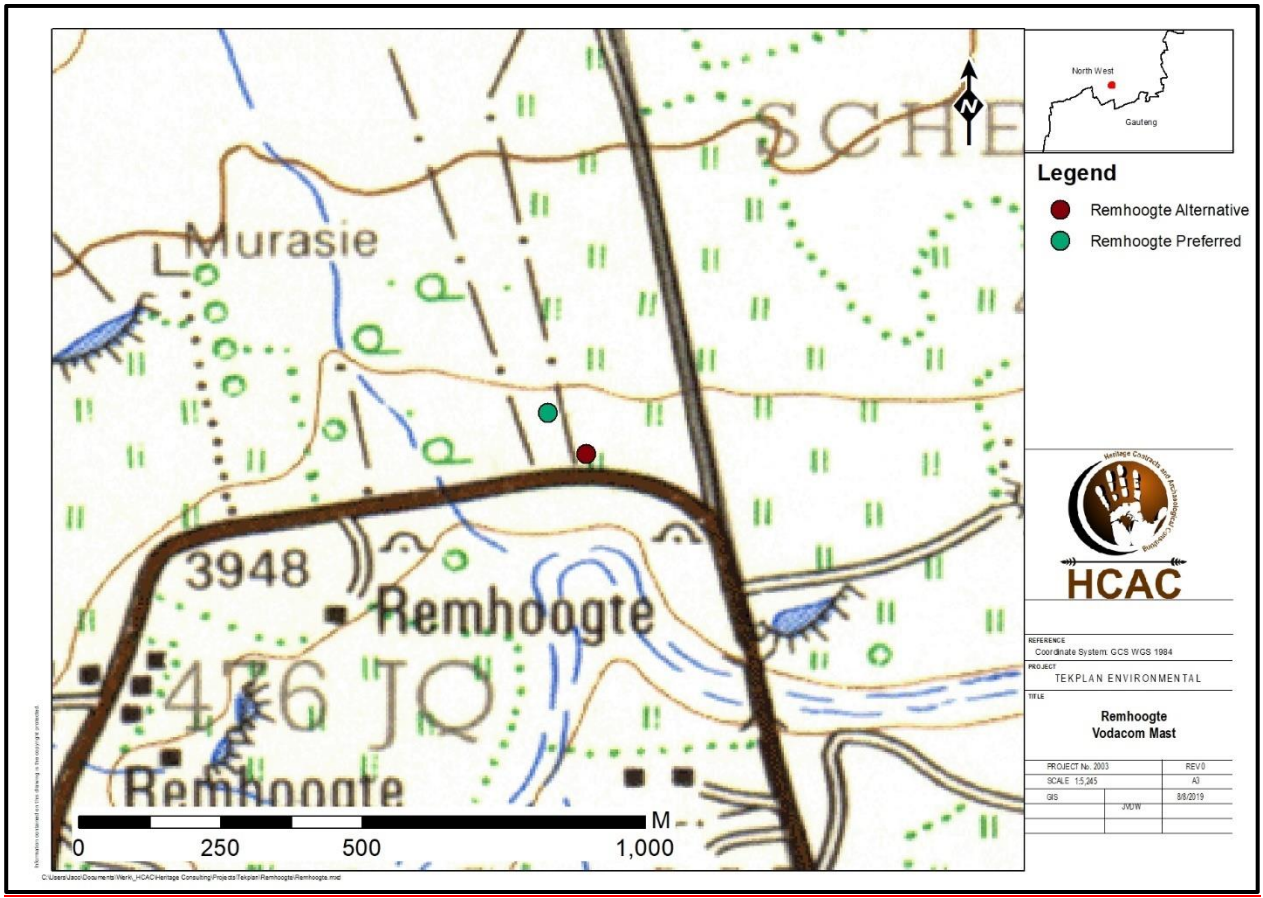

Figure 6. 1968 Topographical map of the site under investigation. The approximate alternatives are indicated with a red and green circle. No developments are visible in the study area, but the area is cultivated with a road indicated to the south (Topographical Map 1968).

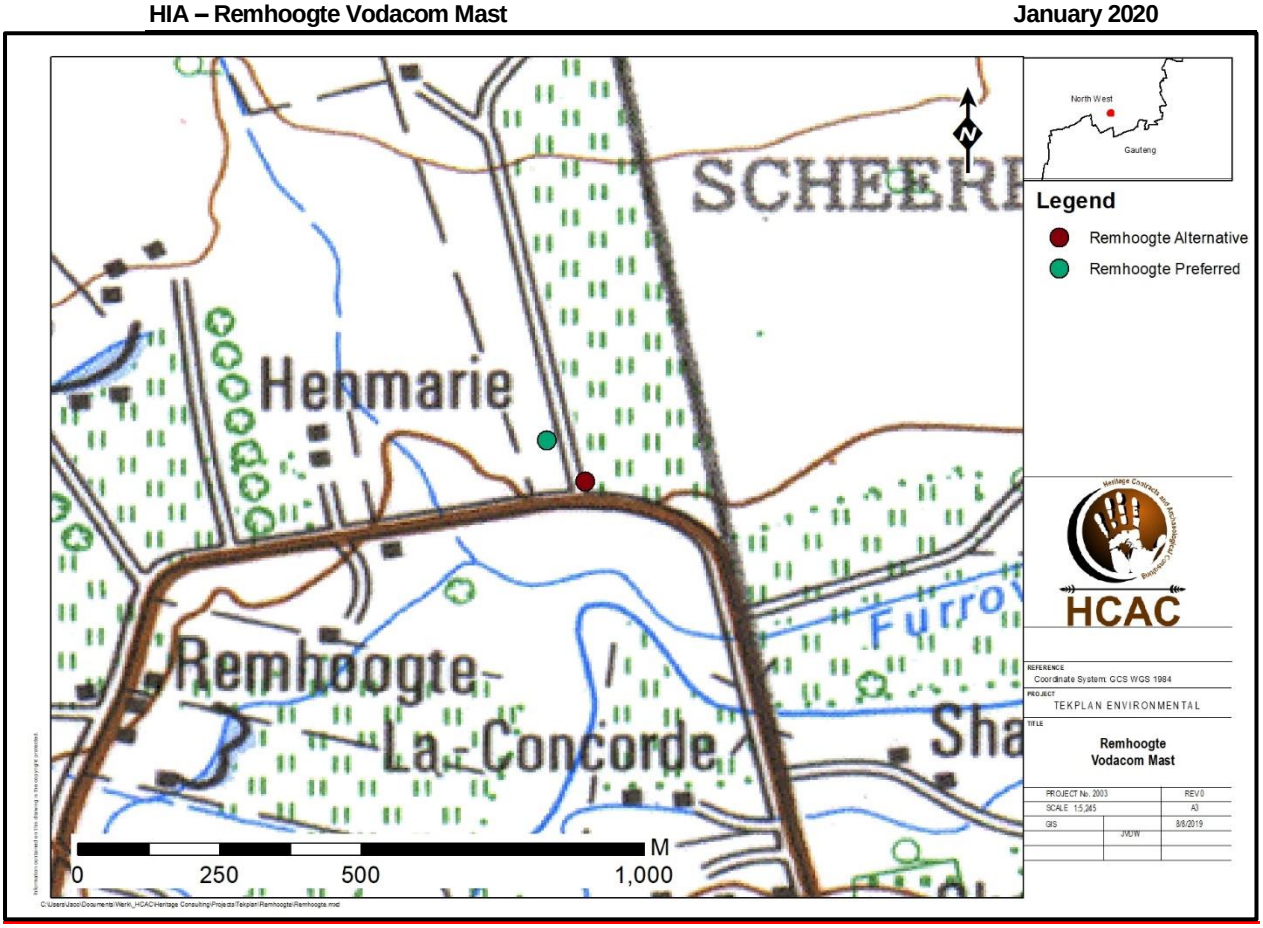

Figure 7. 1985 Topographical map of the site under investigation. The approximate study area is indicated with red and green circle. An access road is indicated close to both alternatives. The area to the east is cultivated cultivated. (Topographical Map 1985).

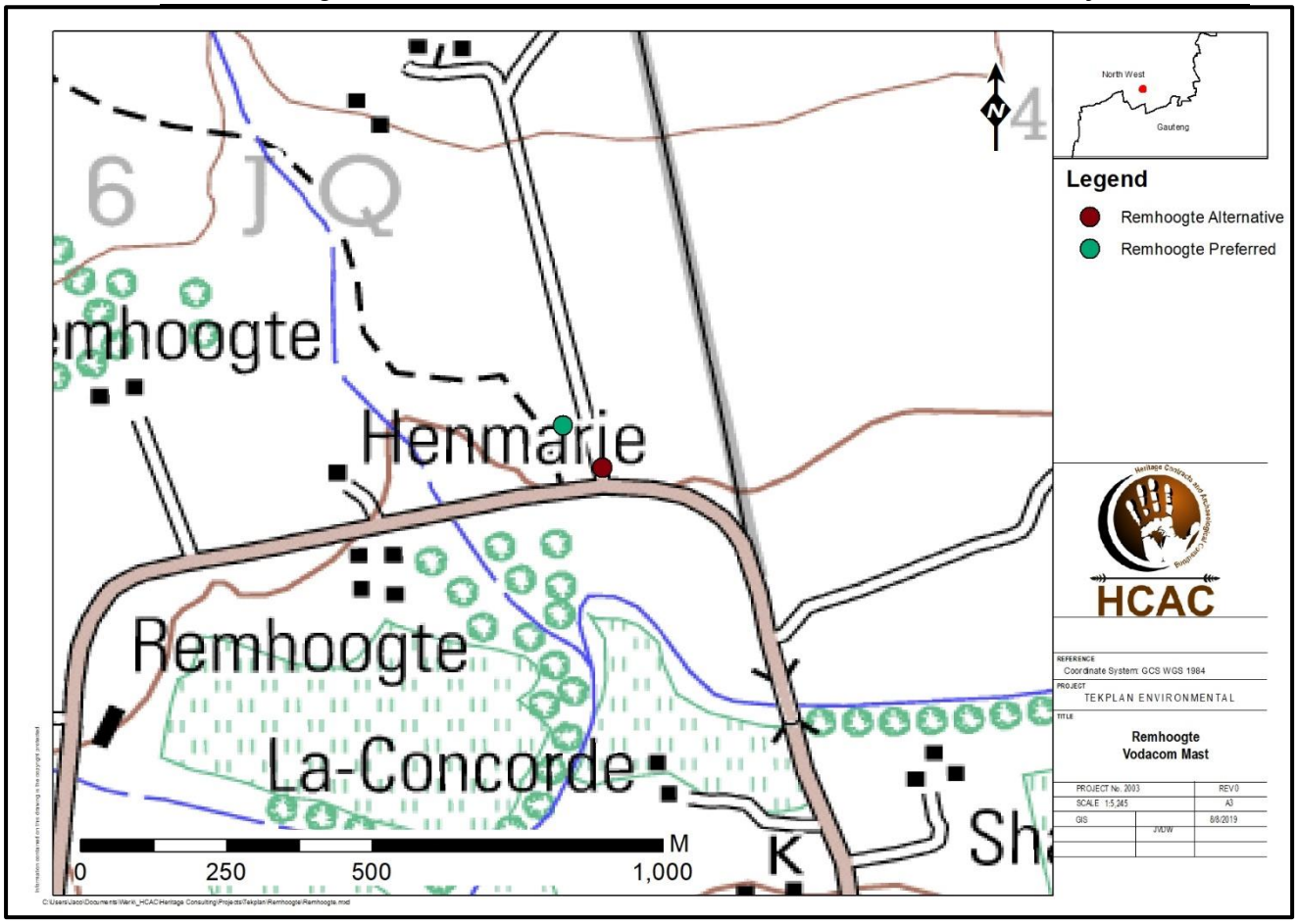

Figure 8.1996 Topographical map of the sites under investigation. The approximate study area is indicated with a red and green circle. An access road is indicated in close proximity to the proposed alternatives (Topographical Map 1996).

8 Findings of the Survey

It is important to note that the survey was concentrated around the proposed development footprint of the two alternatives for the mast and was surveyed over a period of one day. The preferred alternative is marked by dumping of bricks and vegetation that was cut in the area (Figure 9 &10) but is otherwise open with low vegetation (Figure 11). The alternative mast location is also impacted on by dumping of bricks, the construction of a power line and is located next to the access road (Figure 12 – 14).

Figure 9. Preferred site – general site conditions

Figure 10. Preferred site – general site conditions

Figure 11. Preferred site – general site conditions

Figure 12. Alternative site – general site conditions

Figure 13. Alternative site – general site conditions

Figure 14. Alternative site – general site conditions.

During the survey no heritage resources were noted within the proposed impact areas of the two alternatives. However, some cultural material was recorded outside of the impact areas at both alternatives and is discussed below.

Preferred alternative.

The remains of the foundations of a demolished ruin (25°47'17.19"S, 27°43'56.87"E) were noted approximately 20 meters to the south of the preferred alternative located under large trees (Figure 15 - 17). The ruin has been completely destroyed and is not indicated on historical maps. Glass fragments and loose bricks from the demolished structure is scattered over the area. The structures' potential to contribute to aesthetic, historic, scientific and social aspects are non-existent and it is therefore of no heritage significance. The feature will also not be directly impacted on (Figure 23) by the preferred alternative.

Alternative

The existing access road (Figure 18) located between the two alternatives is subjected to sheet erosion and within the road isolated and widely scattered undecorated ceramics were recorded (Figure 19 & 20). The ceramics are mostly from the same vessel and are very weathered probably from being washed down from higher up in the road. The artefacts are out of context and scattered too sparsely to be of significance apart from mentioning them in this report. The ceramic scatter is located outside of the impact areas (Figure 23).

An independent paleontological study was conducted by Prof Marion Bamford (2020). The study concluded that both options (preferred and alternate) for the mast site lie on the shales and sandstones of the Silverton Formation (Pretoria Group, Transvaal Supergroup). These are ancient deepwater sediments and most unlikely to preserve fossils but in the literature, it has been suggested that there are stromatolites present. These are trace fossils of algal colonies but because no organisms are preserved, they are of little interest to palaeontologists. Based on this information she recommended that no palaeontological site visit is required unless fossils are found by the responsible person and the palaeontologist notified (email, photographs) considers them to be of scientific interest (Bamford 2020).

Figure 15. Brick foundation

Figure 16. Brick foundation

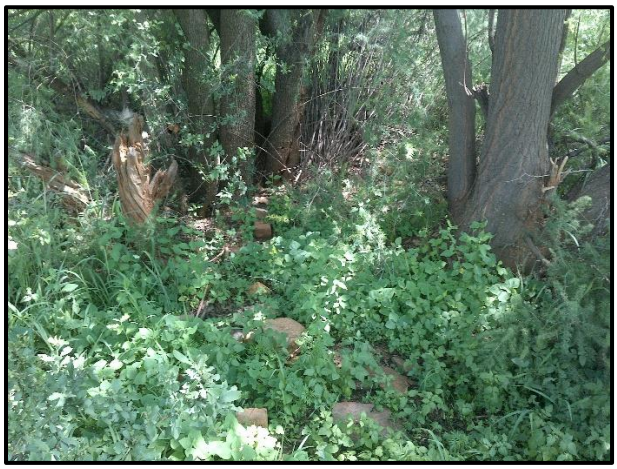

Figure 17. Dumped bricks

Figure 18. Access road

Figure 19. Undecorated ceramic scatters

Figure 20. Undecorated ceramic scatters

8.1 Cultural Landscapes, Intangible and Living Heritage.

The property on which the mast is proposed is located outside of the CoHWHS (Figure 21). The proposed mast will have a negligible impact on the surrounding cultural landscape. This is evident by similar masts (Figure 22) being present close to the proposed development area. Visual impacts to scenic routes and sense of place are also considered to be low due to the other developments in the area.

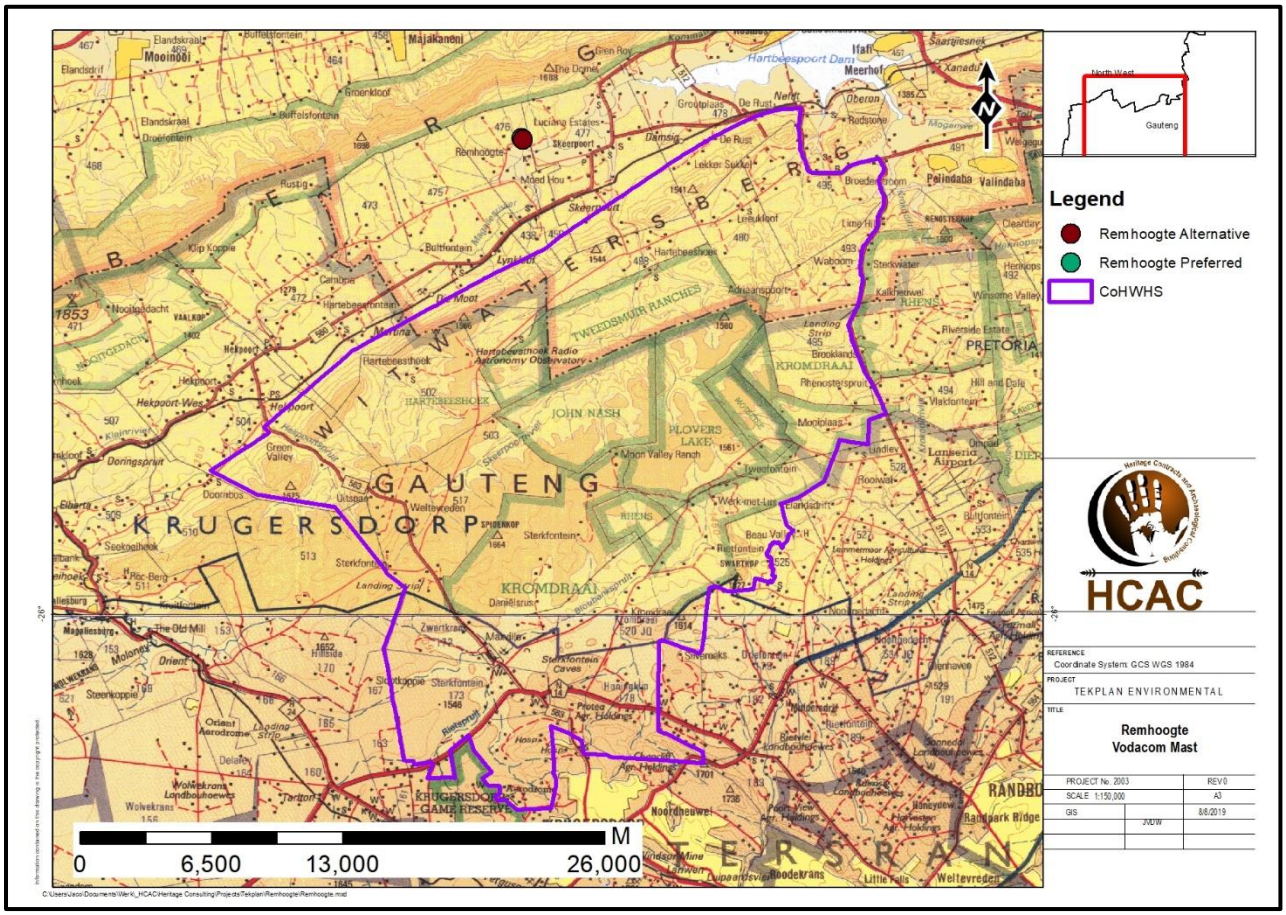

Figure 21. Location of project area in relation to the COH.

Figure 22. Similar developments in the greater study area.

9 Potential Impact

The chances of impacting unknown archaeological sites in the study area is considered to be negligible. Any direct impacts that did occur would be during the construction phase only and would be of very low significance. None of the recorded heritage features will be impacted directly (Figure 23) regardless of their significance. The demolished foundations of a structure is located approximately 20 meters to the south of the preferred mast and the ceramic scatter located within the existing road is approximately 47meters south east of the preferred mast and approximately 53 meters north west of the alternative.

9.1.1 Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.3 Operation Phase:

No impact is envisaged for the recorded heritage resources during this phase.

Table 5. Impact Assessment table.

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Not probable (2)	Not probable (2)
Significance	**16 (Low)**	**16 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded	No resources were recorded.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: Due to the lack of apparent significant heritage resources no further mitigation is required prior to construction. The remains of the brick foundations should be left *in situ* with a 15 meter buffer zone. Due to the presence of ceramics in the area it is recommended that archaeological monitoring occur of earth works in case subsurface cultural material occurs. A Chance Find Procedure should be implemented for the project should any sites be identified during the construction process.		
Cumulative impacts: Due to the lack of developments in the surrounding area and the very small impact area of the proposed mast the cumulative impacts of this development are considered to be acceptable.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted but this cannot be quantified.		

Figure 23. Identified heritage resources in relation to the proposed alternatives.

10 Conclusion and recommendations

Two alternatives for the Remhoogte Vodacom mast was assessed referred to as the preferred alternative and alternative. The impact area of the proposed mast is small, measuring 8 m x 10 m (80m²). The areas assessed are generally flat and marked by the dumping of bricks and vegetation that was cut in the area. The surrounding area was previously cultivated (Figure 6,7 and 8) and these activities would have impacted on surface indicators of heritage sites. In terms of the national estate as defined by the NHRA the following key findings apply:

- In terms of the built environment of the area (Section 34 of the NHRA Act 25 of 1999), no standing structures older than 60 years occur within the impact area. However, the foundations of a demolished ruin were noted approximately 20 meters to the south of the preferred alternative. The ruin has been completely destroyed and is not indicated on historical maps. The structures' potential to contribute to aesthetic, historic, scientific and social aspects are non-existent and it is therefore of no heritage significance. The feature will not be directly impacted on but a 15 meter buffer zone is recommended around the feature.
- Regarding the archaeological component of Section 35 undecorated ceramics were recorded in the existing access road. The existing road located between the two alternatives is subjected to sheet erosion and within the road isolated and widely scattered undecorated ceramics were recorded. The ceramics are mostly from the same vessel and are very weathered probably from being washed down from higher up in the road. The artefacts are out of context and scattered too sparsely to be of significance apart from mentioning them in this report and will not be directly impact on by the proposed mast footprint.
- In terms of the palaeontological component an independent paleontological study was conducted by Prof Marion Bamford (2020) and concluded that, based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the Silverton Formation or the nearby soils of the Quaternary. There is very small chance that trace fossils may occur in the Silverton Formation. It should be noted, however, that stromatolites are of little interest to palaeontologists.
- In terms of Section 36 of the Act no burial sites were recorded.
- No public monuments are located within or close to the study area and the proposed development will not impact negatively on significant cultural landscapes or viewscapes.
- During the public participation process conducted for the project no heritage concerns were raised.
- The proposed mast is located well outside of the boundaries of the Cradle of Humankind (CoH) World Heritage Site and several other telecommunication masts occur in the area. We are of the opinion that the project will have no impact on the larger CoHWHS and on a local scale no impact is foreseen on the cultural landscape.

Due to the lack of significant heritage resources in the impact areas the impact of the proposed project on heritage resources is considered low and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Archaeological monitoring of the site during earthworks to record and document sub-surface stratified cultural deposit;
- Implementation of a chance finds procedure (Archaeological and Palaeontological) as a condition of the EMPr.

10.1. Chance Find Procedures

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 therefor 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.

Monitoring Programme for Palaeontology – to commence once the excavations for foundations begin.

1. The following procedure is only required if fossils are seen on the surface and when excavations commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossil, MISS, stromatolites) should be put aside in a suitably protected place. This way the project 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 Figure 1.5). This information will 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 not 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 monitoring is required.

10.2. Reasoned Opinion

The impact of the proposed project on heritage resources can be mitigated to an acceptable level and no further pre-construction mitigation in terms of archaeological resources is required based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures (i.e. archaeological monitoring and recording) are implemented for the project.

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MAPS

Topographical Map. 1939. *South Africa. 1:50 000 Sheet. 2528CA Pretoria N. W. First Edition. Pretoria: Government Printer.*

Topographical Map. 1965. *South Africa. 1:50 000 Sheet. 2528CA Pretoria. Third Edition. Pretoria: Government Printer.*

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Topographical Map. 1995. *South Africa. 1:50 000 Sheet. 2528CA Pretoria. Sixth Edition. Pretoria: Government Printer.*

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Electronic Sources:

Google Earth. 2018. 25°42'42.18" S 28°*05'16.59" E elev 1309 m.* [Online]. [Cited 30 August 2018].

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12 Appendices:

Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

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Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution:		University of Pretoria
Degree obtained	**:**	BA Heritage Tourism & Archaeology
Year of graduation	**:**	2001
Name of University or Institution:		University of the Witwatersrand
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 Chloorkop 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 Booysendal 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 analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
  - 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
   E-mail: mlombard@uj.ac.za
2. Prof TN Huffman Department of Archaeology Tel: (011) 717 6040
   University of the Witwatersrand
3. Alex Schoeman University of the Witwatersrand
   E-mail:Alex.Schoeman@wits.ac.za