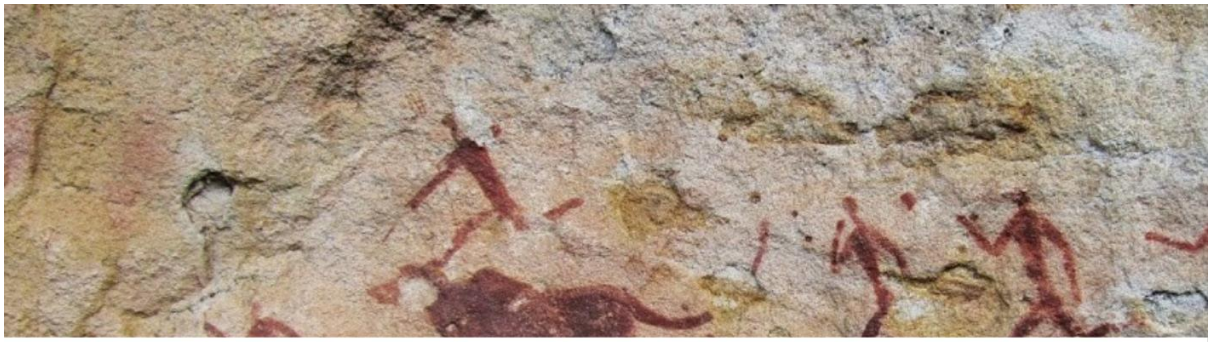


HERITAGE IMPACT ASSESSMUPGRADE OF FOUR BRIDGE STRUCTURES AND CONSTRUCTION OF A NEW BULK WATER PIPELINE WITHIN THE OLIEVENHOUTBOSCH EXT. 60 CITY OF TSHWANEENT FOR THE PROPOSED

ENVIROPRO

PREPARED BY TSIMBA ARCHAEOLOGICAL FOOTPRINTS

Roy Muroyi
MA. Heritage Management (Candidate)
MA. CDS (with specialisation in Archaeo- Interpretation)
Hon. Archaeology, Cultural Heritage &Museum Studies

TSIMBA

https://tsimba-arch.co.za

AUTHOR'S CREDENTIALS

The report was authored by Mr. Roy Muroyi (Archaeologist) Mr. Muroyi is a holder of an Honors Degree, Archaeology, Cultural Heritage and Museum Studies (Midlands State University) and a Masters Degree from the University of Witwatersrand. He is currently pursuing another Masters Degree in Heritage Management at the same institution. He attended further training as a Laboratory Specialist for Human anatomy and human skeletal analysis through the University of Cape-Town human biology department in-conjunction with Cape Archaeological Surveys. Mr Muroyi has over seven years of industry experience, after leaving the Department of National Museums and Monuments of Botswana where he worked as an Archaeological Impact assessments adjudicating officer Mr. Muroyi then moved to South Africa where has been involved in a range of Cultural Resources Management (CRM) companies before starting Tsimba Archaeological Footprints. He has so far exhumed over 500 historical burials as a professional archaeologist and carried out close to a 100 Heritage Impact Assessments.

COPYRIGHT

DECLARATION BY THE SPECIALIST

I, ____Roy Muroyi_____, declare that –

- 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 of the Specialist

DOCUMENT INFORMATION

DOCUMENT INFORMATION ITEM	DESCRIPTION
Proposed development and location	The proposed development is planned for the Upgrading of Four Bridge Structures and New Bulk Water Pipeline Within The Existing Settlement.
Purpose of the study	To carry out a Phase 1 Heritage Impact Assessment to determine the presence/absence of archaeological assess their archaeological significance in terms of the NHRA of 1999 and SHARA guidelines.
Topography	Rolling terrain
Municipalities	Tshwane Metropolitan Municipality.
Predominant land use of surrounding area	Housing
Applicant	City of Tshwane
Site Coordinates	*See Table 2*
EAP	EnviroPro (Pty) Ltd
Heritage Consultant	Tsimba Archaeological Footprints (Pty) Ltd 74Loveday Street, Johannesburg, CBD Gauteng, 2000 E-mail:info@tsimba-arch.co.za rmuroyi23@gmail.com Phone : (+27) 813 717 993 / (+27) 619 12 5118
Author (s)	Mr. Roy Muroyi (Archaeology and Heritage Specialist)

EXECUTIVE SUMMARY

Project Proposal: - The Applicant (City of Tshwane) proposes to upgrade and construct four (4) bridge structures and a new bulk water pipeline within the existing Olievenhoutbosch Ext 60 Settlement, Ward 77 of the City of Tshwane Metropolitan Municipality.

Land Ownership:- Portion 322 (a portion of portion 114) of the farm Olievenhoutbosch No. 389 JR was purchased by the city of Tshwane Metropolitan Municipality during 2014 for the establishment of a housing development which includes mixed uses.

Motivation: - The existing settlement is currently being formalized and this has necessitated the requirement to upgrade the infrastructure on site including the replacement of four (4) existing dilapidated bridges, a 1.34km new bulk water pipeline, 9km of internal roads and stormwater infrastructure. Three (3) of these structures are located on the Rietspruit River and one (1) structure is on a tributary of the Rietspruit River (referred to as the Olievenhoutbosch tributary in this report). The new bulk water pipeline has one (1) watercourse crossing on the Olievenhoutbosch tributary.

The EIA: - Enviropro (Pty) Ltd (hereafter referred to as "the EAP") have been as the independent Environmental Assessment Practitioner (EAP) to undertake the Basic Assessment for the proposed development. Environmental Impact Assessment (EIA) studies are widely known as a suitable approach for assessing the impacts of development projects on the environment (Glasson et al., 2012). Furthermore, all countries in the world including South Africa have some form of legal or administrative requirement for EIA (Morgan, 2012).

The HIA: - For a project of this scale, compliance with national and provincial heritage legislations is imperative. A heritage impact assessment (HIA) is prescribed as a part of predevelopment impact assessment in terms of the National Heritage Resources Act (NHRA) (No. 25, 1999), as this project is likely to have significant impacts on the natural and cultural environment. An HIA is required to mitigate on possible negative effects of physical works, e.g. possible accidental destruction or disturbance of heritage sites.

The scope of work for this Heritage Impact Assessment was to assess written materials and manuscripts about the broader cultural landscape to be affected by the proposed development. It also

included a field based archaeological survey of the proposed development footprint *(see Methodology section).*The proposed development area exceeds 300m in length; therefore it triggers section *38(1) (a) of the National Heritage Resources Act (NHRA- Act No. 25 of 1999)* :- Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as— (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length; (b) the construction of a bridge or similar structure exceeding 50 m in length. The objective of the report is to fulfil the requirements of SAHRA in the in terms of Section 38(1) of the NHRA.

A review of a range of cultural heritage information was undertaken as part of the heritage assessment process. This review included archival information, historical housing and planning documents, research documents and unpublished manuscripts speaking to the general cultural landscape of the proposed development area *(see Cultural Landscape Assessment section).* The National heritage databases, lists and registers, other documented information (including heritage impact assessment reports and a range of ethno-historic and archaeological sources at both local and regional levels) were also consulted for information regarding other heritage resources within the vicinity of the study area.

From this literature review, the following were noted: the proposed development site lies within a region that has no systematic research concerning the Early and Middle Stone Ages. The lower Thukela Basin has been undertaken, although dozens of open air scatters of stone artefacts dating to this period have been recorded there. Most Early Stone Age sites in this region can probably be connected with the hominin species known as Homo erectus. Simply modified stones, hand axes, scraping tools, and other bifacial artefacts had a wide variety of purposes, including butchering animal carcasses, scraping hides, and digging for plant foods. Most archaeological sites in this region from this period are the remains of open camps, often by the sides of water sources, although some are rock shelters, such as Montagu Cave in the Cape region.

- ***Reasoned Opinion: -***

It is the reasoned opinion of the author of this report that no visible material remains pertaining to heritage resources occur within the proposed development footprint. Subject to adherence of the recommendations and approval by SAHRA the proposed development may be allowed to continue under the following conditions;

- Should skeletal or archaeological remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted.
- Section 36 (6) of the National Heritage and Resources Act, 25 of 1999 also states that should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified archaeologist.

TABLE OF CONTENTS

FIGURES AND TABLES

ABBREVIATIONS

Acronyms	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GIS	Geographic Information System
GPS	Global Positioning System
HIA	Heritage Impact Assessment
LSA	Late Stone Age
LIA	Late Iron Age
MIA	Middle Iron Age
MSA	Middle Stone Age
SAHRA	South African Heritage Resources Agency

GLOSSARY

Achievement	❖ Something accomplished, esp. by valour, boldness, or superior ability
Aesthetic	❖ Relating to the sense of the beautiful or the science of aesthetics.
Community	❖ All the people of a specific locality or country
Culture	❖ The sum total of ways of living built up by a group of human beings, which is transmitted from one generation to another.
Cultural	❖ Of or relating to culture or cultivation.
Diversity	❖ The state or fact of being diverse; difference; unlikeness.
Geological (geology)	❖ The science which treats of the earth, the rocks of which it is composed, and the changes which it has undergone or is undergoing.
High	❖ Intensified; exceeding the common degree or measure; strong; intense, energetic
Importance	❖ The quality or fact of being important.
influence	❖ Power of producing effects by invisible or insensible means.
Potential	❖ Possible as opposed to actual.
Integrity	❖ The state of being whole, entire, or undiminished.
Religious	❖ Of, relating to, or concerned with religion.
Significant	❖ important; of consequence
Social	❖ Living, or disposed to live, in companionship with others or in a community, rather than in isolation.
Spiritual	❖ Of, relating to, or consisting of spirit or incorporeal being.
Valued	❖ Highly regarded or esteemed

1.0 INTRODUCTION

1.1 Project Background

Tsimba Archaeological Footprints (Pty) Ltd was requested by Enviropro (Pty) Ltd to conduct a Heritage Impact Assessment (HIA) for the proposed upgrade and construction of four (4) bridge structures and a new bulk water pipeline within the existing Olievenhoutbosch Ext 60 Settlement, Ward 77 of the City of Tshwane Metropolitan Municipality. Portion 322 (a portion of portion 114) of the farm Olievenhoutbosch No. 389 JR was purchased by the city of Tshwane Metropolitan Municipality during 2014 for the establishment of a housing development which includes mixed uses. According to historical research this area was a scene of series of colonial wars. By the end of the 19th century, the region was placed under British rule and the local people displaced. Today most of the general land is used for commercial, housing, agricultural activities and industrial activities. It is within this cultural landscape that the project area is located. Archaeologically, the area is associated with Late Iron Age Sotho Tswana communities and has yielded four ceramic sequences of the Urehwe tradition: Ntsuanatsatsi (1450-1650), Olifantspoort (AD 1500 -1700) and Uitkomst (AD 1700-1850) and Buispoort (1700-1840) (Huffman 2007: 443).

This HIA is designed to assist statutory authorities in identifying and preventing the approval of aggressive developments, understood as the development that destroys the cultural significance of heritage properties. The HIA structures an evaluation of the potential damage or benefits that may accrue to the significance of the cultural heritage assets.

The Environmental impact assessments (EIA) conducted by Enviropro (Pty) Ltd an analytic approach for evaluating the impacts of development, widely adopted as part of the land use planning system in many countries (Glasson and Therivel, 2013). Whenever relevant, EIA also include cultural heritage as a factor to be evaluated. Both EIA and HIA adopt a similar approach. In brief, first, the overall scope of the study is defined. Second, a baseline survey is carried out to provide a reference point against which impacts can be measured, including a desktop study and/or a field research.

1.2 Scope of the overall project (All information in this section was provided by the client)

The demolition of the old structures and construction of the four (4) new bridges and pipeline watercourse crossing will entail the infill and removal of more than 10m3 of material from within the Rietspruit River and Olievenhoutbosch tributary and the construction of more than 100m2 of infrastructure within the two

watercourses. The proposed upgrades will also result in the construction of more than 10m2 of infrastructure within the two watercourses and clearance of more than 300m2 of indigenous vegetation within a Critical Biodiversity Area as per the Gauteng C-Plan and the endangered Egoli Granite Grassland ecosystem type as per section 52 of the NEMBA. The supporting pillars will be placed outside of the river channel and banks and be anchored into the bedrock. Where possible, large spans will be allowed between the supporting piers to avoid blocking the river flow as much as possible and to accommodate the higher flow levels that would be experienced during a 1:100-year flood event. The existing structures will be used to cross the river during construction of the new bridges therefore there will be no need for any temporary structures. The new bridges will be constructed in phases. The four new bridge and bulk water pipeline watercourse crossing will consist of the following approximate dimensions:

Table 1: Project alternatives and specification (information provided by Eviropro)

Alternative	Specifications
Bridge 1	**(Seroto Street and Kgothatsa Street)** ❖ The new bridge will be a four (4) span continuous reinforced concrete voided deck supported on reinforced concrete abutments (two) and piers (two) on either side of the river. ❖ The bridge will be built to the following specifications: - It will be 49.7m in length and 10m wide, - It will have two (2) piers that will be placed outside of the macro channel, - The deck will accommodate two 3.5m lanes (dual lane) with a 1.5m sidewalk on one side of the bridge and a 1m shoulder on the other side of the bridge, - The deck will stand 6m above the river bed, - The bridge abutments will be spaced as follows: ▪ Abutment 1 – Pier 1 = 14.5m ▪ Pier 1 – Pier 2 = 19m ▪ Pier 2 – Abutment 2 = 14.5m
Bridge 2	**(Samrand Road and Borankana Street)** ❖ The new bridge will be a single (one) span reinforced concrete voided deck supported on two reinforced concrete abutments. ❖ The bridge will be built to the following specifications: - It will be 20.56m in length and 10m wide, - It will have two (2) abutments that will be placed outside of the stream channel, - The deck will accommodate two 3.5m lanes (dual lane) with a 1.5m sidewalk on one side of the bridge and a 1m shoulder on the other side of the bridge, - The deck will stand 3m above the river bed, - The bridge abutments will be spaced as follows: ▪ Abutment 1 – Abutment 2 = 20m
Bridge 3	**(Letsha Street and Setolotolo Street)** ❖ The new bridge will be a four (4) span continuous reinforced concrete voided deck supported on reinforced concrete abutments (two) and piers (two) on either side of the river. ❖ The bridge will be built to the following specifications:

	- It will be 49.7m in length and 10m wide, - It will have two (2) piers that will be placed outside of the stream channel, - The deck will accommodate two 3.5m lanes (dual lane) with a 1.5m sidewalk on one side of the bridge and a 1m shoulder on the other side of the bridge, - The deck will stand 4.8m above the river, - The bridge abutments will be spaced as per the following: ▪ Abutment 1 – Pier 1 = 14.5m ▪ Pier 1 – Pier 2 = 19m ▪ Pier 2 – Abutment 2 = 14.5m
Bridge 4	**(Samrand Avenue and Bathlaping Street)** ❖ The new dual carriageway will be a four (4) span continuous reinforced concrete voided deck supported on reinforced concrete abutments (two) and piers (two) on either side of the river. ❖ The bridge will be built to the following specifications: - It will be 49.7m in length and 23.8m wide, - It will have two (2) piers that will be placed outside of the stream channel, - The deck will accommodate four 3.7m lanes (dual lane) with a 1.5m sidewalk on either side of the bridge, a 4.34m raised median in between the westbound and eastbound carriageway and a 1m shoulder on the other side of the centered raised median, - The deck will stand 4m above the river bed - The bridge abutments will be spaced as follows: ▪ Abutment 1 – Pier 1 = 14.5m ▪ Pier 1 – Pier 2 = 19m ▪ Pier 2 – Abutment 2 = 14.5m
Pipeline crossing	❖ The total length of the pipeline is 1.34km and will tie into the existing reticulation. ❖ The pipe will be a 355mm diameter (Class 12) uPVC pipe. ❖ The pipe crossing under the bed of the watercourse will be: - 22m across the watercourse - At a depth of 1.85m - Encased in concrete

1.3 Scope of the Phase 1 HIA

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 within the broader cultural landscape;
- ❖ 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.

1.3 The aim of this HIA: - There are two interlinked aims for this HIA. The first is to identify and document cultural heritage sites, cultural resources, sites associated with oral histories (intangible heritage), graves, cultural landscapes, and any structures of historical significance (tangible heritage) that may be affected within the development footprint. The second aim of this HIA is to assess the archaeological significance of the findings and make recommendations based on the best archaeological practice of interpretation and preservation of archaeological findings

1.4 The findings: - The findings of this report have been informed by desktop data review and impact assessment reporting which include recommendations to guide heritage authorities in making decisions with regards to the proposed project. This study was conducted before any activities too place on the proposed development area. The impact assessment study also includes detailed recommendations on how to mitigate and manage negative impacts while enhancing positive effects on the project area.

1.5 Legislative Frame works used

The South African Heritage Resources Agency (SAHRA) aims to conserve and control the management, research, alteration and destruction of cultural resources of South Africa and to prosecute if necessary. It is therefore crucially important to adhere to heritage resource legislation contained in the Government Gazette of the Republic of South Africa (Act No.25 of 1999), as many heritage sites are threatened daily by development. Conservation legislation requires an impact assessment report to be submitted for development authorisation that must include an HIA if triggered. The following legislative frameworks were used in compiling this HIA report;

- The Australia ICOMOS charter for places of cultural significance (the Burra Charter).
- The Principles for the analysis, conservation and structural restoration of architectural heritage (2003)
- The National Heritage and Resources Act of South Africa No.25 of 1999
- The Athens Charter, the Restoration of Historic Monuments (1931)
  The International Council on Monuments and Sites (1965)
- The World Heritage Convention(1972)
- The Washington Charter (1987)
- The International Charter for the Conservation and Restoration of Monuments and sites (the Venice charter 2006).
- The Organisation of World Heritage Cities (1993).

2.0 DESCRIPTION OF THE RECEIVING ENVIRONMENT

2.1 Location

Table 2: Site 1 Description

Site 1: Gilead Substation			
Coordinates	Alternative		
	Alternative: Bridge 1	25.909910°S 28.116756°E	25°54'35.67"S 28° 7'0.32"E
	Alternative: Bridge 2	25.910814°S 28.119525°E	25°54'38.93"S 28° 7'10.29"E
	Alternative: Bridge 3	25.913633°S 28.116428°E	25°54'49.08"S 28° 6'59.14"E
Ownership	City of Tshwane		
Land Use	Urban Housing		
Zoning	Urban Housing		
Description	Olievenhoutbosch Ext 60 – Proposed Upgrade of Four Bridge Structures and New Bulk Water Pipeline Within The Existing Settlement.		

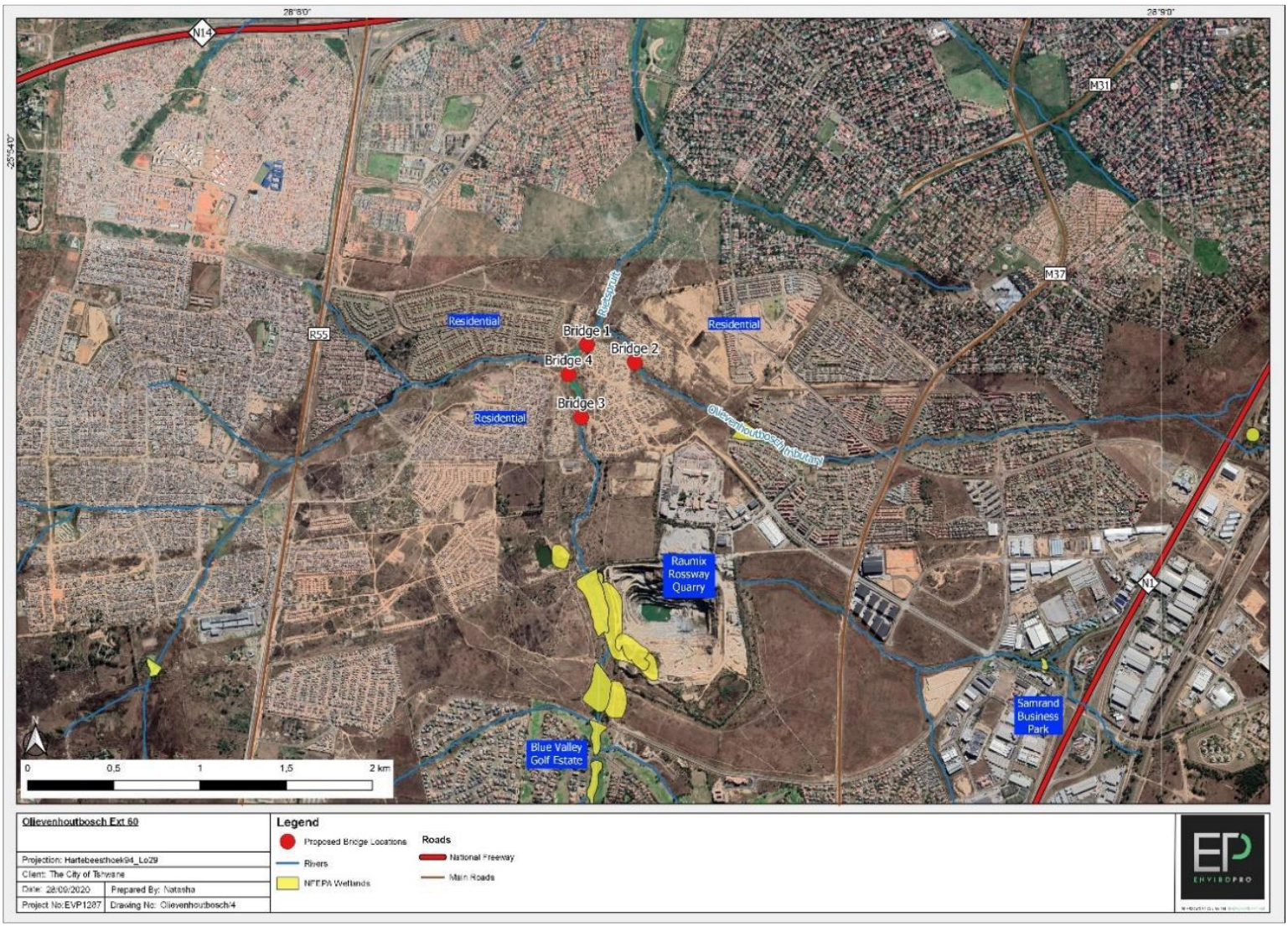


Figure 1: Aerial Photograph Showing an Overview of the Proposed Development and the Surrounding Topography and Land Use (EnviroPro).

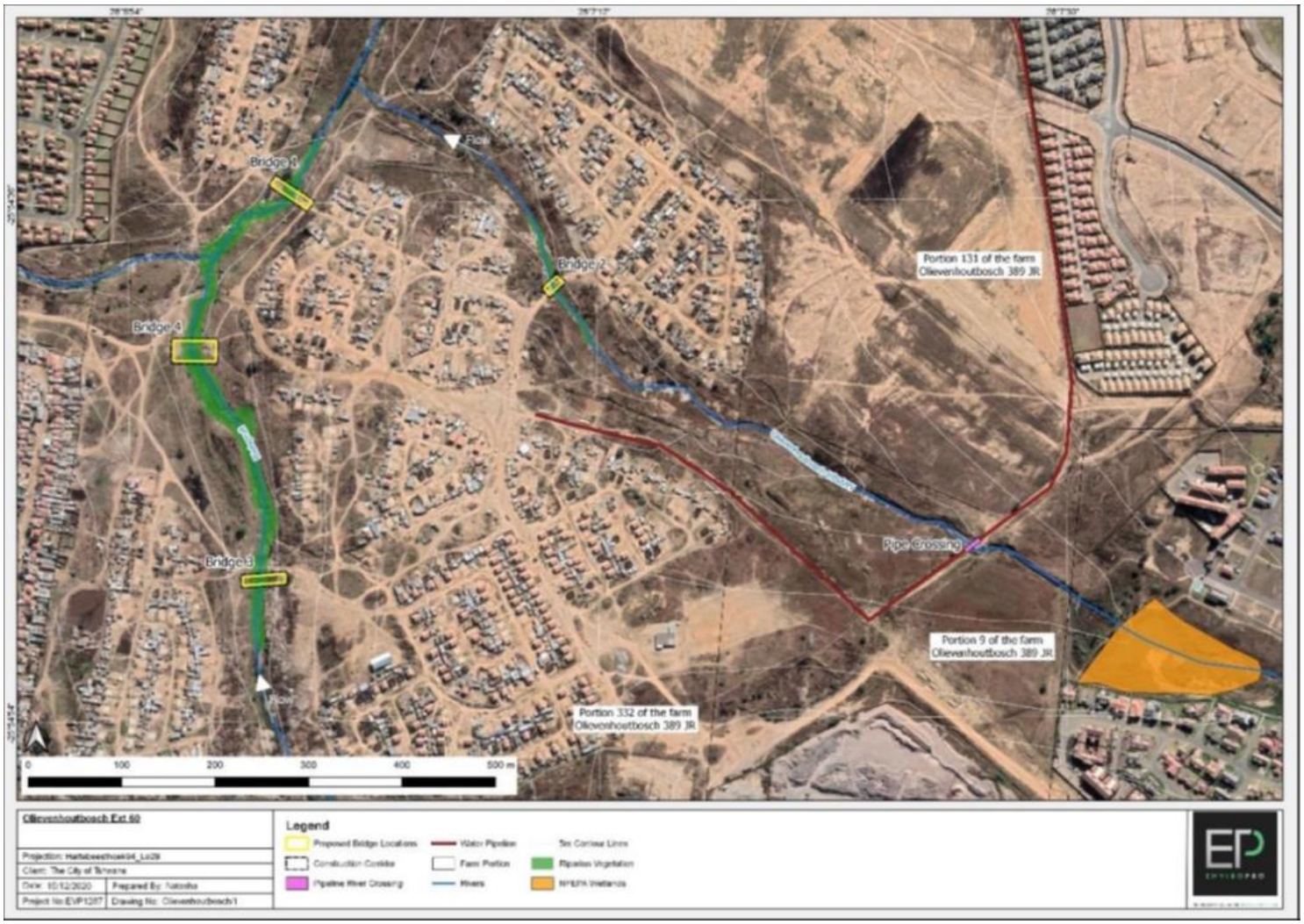


Figure 2: Aerial image showing the Location of the four bridge upgrades and new bulk water pipeline in Olievenhoutbosch Ext 60 (EnviroPro).

2.2 Geo-spatial Context

Olievenhoutbosch forms part of the Urban Cores otherwise referred to as the underserviced township areas. Some of the towhships that fall into the same category under the City of Tshwane include Mabopane, Ekangala, Atteridgeville, Mamelodi, Ga- Rankuwa Hammanskraal, , Refilwe, Soshanguve, Temba and Zithobeni (Bigen Africa, 2011). Olievenhoutbosch also falls within Region four (4) of the city, linking up Centurion and Pretoria[1]. Though the project servitude is concentrated around the river, In and around the township Infrastructure includes a fully tarred road network and stormwater drainage, waterborne sanitation as well as individually metered water and electricity connections

[1] http://www.tshwane.gov.za/sites/regions/Pages/Region-4.aspx
City of Tshwane (2015)Welcome to City of Tshwane: Accessed 16/04/2021

3.0 METHODOLOGY

3.1 Literature review (see Cultural Landscape Section)

The methodology used in this HIA is based on a comprehensive understanding of the current or baseline situation; the type, distribution and significance of heritage resources as revealed through desk-based study and additional data acquisition, such as archaeological investigations, previous heritage impact assessments reports and intangible heritage. This is systematically integrated by the use of matrices with information on the nature and extent of the proposed engineering and other works to identify potential. The following tasks were also undertaken in relation to the cultural heritage and are described in this report:

The background information search of the proposed development area was conducted following the site maps from the client. Sources used in this study included:

- Published academic papers and HIA and PIA studies conducted in and around the region where the proposed infrastructure development will take place;
- Available archaeological literature on the broader study area was consulted;
- The SAHRIS website and the National Data Base were consulted to obtain background information on previous heritage surveys and assessments in the area; and other planning documents.
- Map Archives - Historical maps of the proposed area of development and its surrounds were assessed to aid information gathering of the proposed area of development and its surrounds

3.3 Archaeological Field Survey

The archaeological reconnaissance of the study area was conducted by Mr. Roy Muroyi (Principal Archaeologist – Tsimba) and Mr. Multhus Bhebe (Assistant Archaeologist - Tsimba) through an unsystematic pedestrian site survey. A systematic pedestrian survey was not possible due to the nature of the proposed development site which is limited to the river.

3.4 Data Consolidation and Report Writing

Data captured on the development area (during the field survey) by means of a desktop study and physical survey is used as a basis for this HIA. This data is also used to establish assessment for any possible current and future impacts within the development footprint. This includes the following:

- Assessment of the significance of the cultural resources in terms of their archaeological, built environment and landscape, historical, scientific, social, religious, aesthetic and tourism value;
- A description of possible impacts of the proposed development, especially during the construction phase, in accordance with the standards and conventions for the management of cultural environments;
- Proposal of suitable mitigation measures to minimize possible negative impacts on the cultural environment and resources that may result during construction;
- Review of applicable legislative requirements that is the NEMA (read together with the 2014 EIA Regulations) and the NHRA of 1999
- The consolidation of the data collected using the various sources as described above;
- Acknowledgement of impacts on heritage resources (such as unearthed graves) predicted to occur during construction; and
- Geological Information Systems mapping of known archaeological sites and maps in the region
- A discussion of the results of this study with conclusions and recommendations based on the available data and study findings.

4.0 LEGISLATIVE FRAMEWORK

This HIA is informed and conducted to fulfil the requirements of the National Heritage Resources Act (No 25 of 1999) *38(1) (a) of the National Heritage Resources Act (NHRA- Act No. 25 of 1999) (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—any development or other activity which will change the character of a site— (a) the construction of a road, wall, powerline, pipeline, canal or other similarform of linear development or barrier exceeding 300m in length.*

4.1 Supporting Legislations

The Human Tissue Act Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925 Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial

must be obtained from the relevant Provincial Member of the Executive Committee as well as the relevant Local Authorities

4.2 The Terms of Reference for this HIA study are:

Heritage impact assessments (hereinafter referred to as HIA) are applied to cultural heritage assets. This is a recent notion grounded in the requirements to perform environmental assessments at the project or more strategic levels. The practice of performing an impact analysis is not new, however. As Clark (2001, p. 22) observes, "Impact analysis is not a particularly special, unusual or complex process; it is simply a codification of the basic analysis undertaken by any competent conservation adviser". The HIA exists to:

- Review existing theories and models of cultural heritage resources interpretation and how to develop effective methods of archaeological interpretation for future generations to assist and assist SAHRA in their deliberations;
- Clarify the extent and ways in which current site context archaeological findings may affect the interpretation of cultural sites for present and future generations;
- Shed light on the potential challenges and opportunities brought about by the existence of archaeological sites and other conflicting views of the values of a site;
- Set out the ethical considerations on the interpretation and preservation of archaeological findings given the varied range of approaches available;
- Explain that the issue of archaeological preservation and conservation as relevant not only National Heritage or Provincial Heritage properties, but also for any significant cultural site;
- Focus on best practice of interpretation and preservation of archaeological findings.

4.3 Cultural Heritage Resources Management Policy Objectives

a. To preserve representative samples of the National archaeological resources for the scientific and educational benefit of present and future generations;
b. To ensure that development proponents consider archaeological resource values and concerns in the course of project planning; and
c. To ensure where decisions are made to develop land, the proponents adopt one of the following actions:
    - avoid archaeological sites wherever possible;

- implement measures which will mitigate project impacts on archaeological sites; or
- Compensate the local communities for unavoidable losses of significant archaeological value.

5.0 CULTURAL LANDSCAPE ASSESSMENT

5.1 Introduction

Recent heritage management research has shown that it is important to have a clear framework of criteria to in order to be able to interpret the cultural heritage significance of any particular landscape. This interpretation will be based on established practice from other works that have been carried out within the existing cultural landscape. It will be based on a wide range of criteria (archaeological background of the area, historical background of the area, the settlement pattern in the area and degree of apparent human influence, among others) and it will define the degree of significance of the existing cultural landscape.

The question of the value of cultural landscape receptors will need careful consideration. By its very nature the work is concerned with designated cultural landscapes of national value for their cultural heritage values but the cultural landscapes within designated areas do nevertheless vary in their character and quality. It may therefore be appropriate to make a fine grained assessment of the value of the cultural landscape character areas affected in the designated area. This will draw on statements about the special qualities contributing to the cultural heritage value of individual designated areas, on established criteria such as landscape quality and condition, scenic quality, historic/ heritage value, perceptual aspects and associations, and on other information such as the extent and setting of heritage assets including registered cultural heritage sites, burial grounds and archaeological sites.

5.2 Methodology

The methodology employed in carrying out the cultural landscape assessment of the proposal for this proposed development has been drawn from best practice guidelines and the Landscape Institute and the Institute of Environmental Management & Assessments “Guidelines for Landscape and Visual Impact Assessment” Second Edition (Spon Press 2002).The aim of these guidelines is to set high standards for the scope and contents of landscape and visual assessments and to establish certain principles that will help to achieve consistency, credibility and effectiveness in cultural landscape impact assessment. Guidance is contained in this publication on some approaches and techniques, which have been found to be effective and useful in practice by landscape professionals. However, the guidelines are not intended as a prescriptive set of rules, and have been adapted to the specific project.

Stage 1: Through a desktop and archival research process the heritage specialist is required to identify those landscape character types/areas of National, Provincial and Regional heritage

significance which may be affected by the proposed development. The specialist should also locate information relevant to assessing landscape value for example written historical statements of special qualities.

Stage 2: Initial identification of potential effects the proposed development will bring to the broader regional area and design options to mitigate potential effects;

Stage 3: Design the development taking account of identified potential mitigation measures to avoid negative effects.

Stage 4: Assessment of effects the proposed developments has on the broader cultural landscape and considers its residual effects;

Stage 5: Fitting the cultural landscape assessment into the whole HIA.

5.3 Archaeological background

The broader Gauteng area is known for its evidence of human settlement extending into hundreds of thousands of years of prehistory that include the Stone Age, Iron Age, Historical period and contemporary communities. The palaeontological human-evolution record is reach in palaeoanthropological relics that were found in Stekfontein and Maropeng areas that are popularly known as the Cradle of Mankind that is also a World Heritage Site[2].

While there are no well-known Stone Age sites located in the Gauteng area there is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools where recorded. LSA material is recorded along ridges to the south of the current study area (Huffman 2008). Petroglyphs occur at Redan as well as along the Vaal River (Berg 1999). Records indicate that stone tools dating to the Early and Middle Stone Age and especially the Later Stone Age occurred all over, for example in the Jukskei River area at Glenferness shelter, excavated by Professor. Revil Mason (1986). Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known sites at Broederstroom south of Hartebeespoort Dam dating to AD 470. Having only had cereals (sorghum, millet) that need summer rainfall, Early Iron Age (EIA) people did not move outside this rainfall zone, and neither did they occupy the central interior highveld area.

[2] https://www.maropeng.co.za/content/page/sterkfontein-caves
Craddle of Human Kind (2010) MAROPENG AND STERKFONTEIN CAVES :Official Visitor Centres for the Cradle of Humankind World Heritage Site

The occupation of the larger geographical area (including the study area) did not start much before the 1500s. By the 16th century things changed, with the climate becoming warmer and wetter, creating condition that allowed Late Iron Age (LIA) farmers to occupy areas previously unsuitable, for example the Witwatersrand in the region of Klipriviersberg and the Magaliesberg to the north (Horn 1996). A distinction between the Iron Age and the LSA is drawn on the basis and on the fact that the Iron Age communities occupied the foot-hills and valley lands introducing sedentary life, domesticated livestock, crop production and the use of iron (Maggs 1976, Huffman 1993, van Schalkwyk, 2005). Stonewalls are one of the major characteristic of the Iron Age people. Cattle dung, both vetrified and unvetrified, is also one of the Iron Age traits (see Huffman (1993).

Huffman also includes pits and burials, with some located inside the cattle kraals. This would have varied from cultures to cultures and traditions to traditions. For example, alongside the Urewe Tradition is the second group called the Kalundu Tradition whose EIA archaeological sites have been recorded in most of South Africa's northern and central regions. These are therefore some of the important Iron Age traditions in the EIA. Iron Age sites associated with the ancestors of the modern Sotho-Tswana and Ndebele speaking communities are wide spread in the region. In recent colonial history, the area played host to different competing local settler communities. The area was a scene of series of colonial wars. By the end of the 19th century, the region was placed under British rule and the local people displaced. Today most of the general land land is used for commercial, housing , mining, agricultural activities and industrial activities. It is within this cultural landscape that the project area is located. Archaeologically, the Gauteng is associated with Late Iron Age Sotho Tswana communities and has yielded four ceramic sequences of the Urehwe tradition: Ntsuanatsatsi (1450-1650), Olifantspoort (AD 1500 -1700) and Uitkomst (AD 1700-1850) and Buispoort (1700-1840) [Huffman 2007: 443).

This area was historically occupied by predominantly Sotho Tswana -speaking groups before Mzilikazi's Ndebele briefly dominated it during the Mfecane. Around the 1830s, the region also witnessed the massive movements associated with the Mfecane ('wandering hordes'). The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988). The area was partitioned into commercial settler farms during the colonial period. Melville Koppies is most well documented site in the project area. The site was excavated by Professor Mason from the Department of Archaeology of WITS in the 1980"s. Extensive Stone walled sites are also recorded at Klipriviers Berg Nature reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are

common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date to the 18th and 19th centuries and were built by people in the Fokeng cluster. In this area the Klipriviersberg walling probably ended around AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi. Prior to the Gauteng region being incorporated into the colonial administration of the Transvaal, the region experienced several episodes of white settler migration and settler settlements as well as the associated colonial wars such as the Anglo-Boer War, which ended in 1902.

5.5 Historical Background

Long Distance Trade:-The Late Iron Age Nguni communities engaged in the Indian Ocean Trade exporting ivory and importing consumables such as cloth and glass beads. The exporting point was Delagoa. This brought the Nguni speaking community in touch with the Indo-Asian and first Europeans (Portuguese). It was the arrival of the Dutch and the English traders that opened up Delagoa Bay to more trade did the Nguni engaged in extensive trade with the international traders (Huffman 2007). From the late 1700s, trade in supply of meat to passing ship had increased substantially to an extent that by 1800 meat trade is estimated to have surpassed ivory trade. At the same time population was booming following the increased food production that came with the introduction of maize that became the staple food. Naturally, there were signs that population groups had to compete for resources especially along the east coastal regions.

Mfecane:- The KwaZulu Natal coastal region has a special place in the history of the region and country at large. This relates to the most referenced Mfecane (wandering hordes) period of tremendous insecurity and military stress which eventually affected the entire Southern Africa including the modern day Gauteng area. Around the 1830s, the region also witnessed the massive movements associated with the Mfecane. The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988). In this context new African kingdoms emerged such as the Zulu Kingdom under Shaka in the second quarter of the 1800s AD. Military pressure from Zululand spilled onto the highveld by at least 1821. Various marauding groups of displaced Sotho-Tswana moved across the plateau in the 1820s. Mzilikazi raided the plateau extensively between 1825 and 1837. And throughout this time settled communities of Tswana people also attacked each other. As a result of this troubled period, Sotho-Tswana people concentrated into large towns for defensive purposes. Their settlements were built of stone because of the lack of trees in the project area.

These stone-walled villages were almost always located near cultivatable soil and a source of water. Such sites are known to occur near Kriel (e.g. Pelser, 2006). White settlers moved into the Gauteng area during the first half of the 19th century. Within Gauteng Province and our study area the settlers are dated to 1840s. Palestrant (1986) places the date for the Voortrekker's in the Witwatersrand to 1830 and a date of 1842 for one of the earliest established farms."The part of the Highveld which was eventually to become Johannesburg had at the time few established farms. One of the earliest was situated at Klipriviersdale and belonged to the Meyer's family who had settled there in 1842. Their nearest white neighbours were miles away – the Marais, beyond Heidelburg and the Erasmus and Strydoms families, near Olifantsfontein (Pistoris 2006).

European Settlement::- European settlers of Dutch descent – the Afrikaans communities established earliest colonial settlements after they Trekked from the then Cape Colony to avoid British Administration in the 1930s and 19840s. They fall within what was then called the Transvaal -direct translation for "across the Vaal River". During the Great Trek these Afrikaans communities, commonly referred to as the Boers (farmers), who left the British Administration of the Cape Colony (i.e. a former Dutch colony in 1795 and again in 1806) established several republics north and north- west of the British Colonies - these republics included the Boer Republics of the Orange Free State (1845) and the Transvaal across the Vaal River were the study area is located. The Transvaal which had different autonomous and separate states which were later united to form what became known as the Zuid Afrikaanse Republiek (South African Republic) the ZAR (Celliers, 2010). During the historical period the availability of natural resources also played a pivotal role in the choice of settlement of people, based not only from a subsistence point of view but also driven by commerce or commercial gains resulting from the exploitation of available natural resources such as gold discovered within the Witwatersrand particularly after the discovery of gold in 1884.

5.6 Olievenhoutbosch Brief Heritage Trail

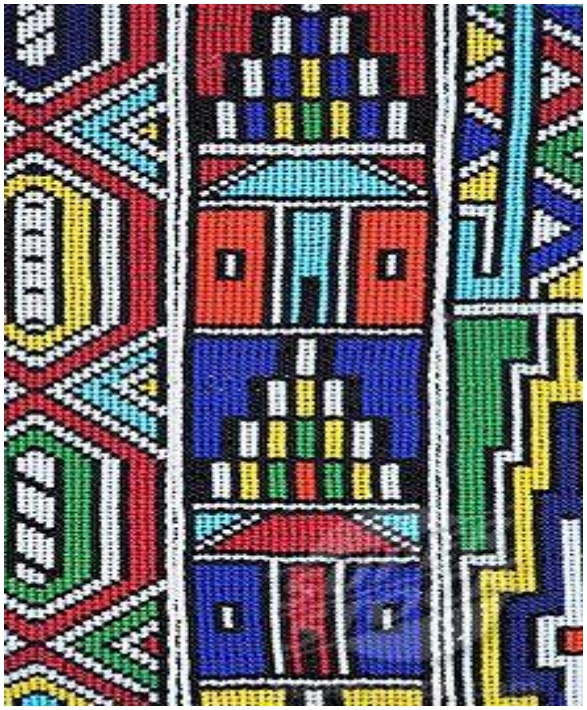
The area around Olievenhoutbosch was originally occupied and established by the Ndebelec before 1600. In the 1600s the area was governed by the Ndebele Khosi Musi who governed the area from his kraal and throne eMhlangeni, a place he named after his father Mhlanga, which is modern day Mohlakeng (Randfontein). The period from 1820 to 1832, known as the Mfecane or Difeqane, was characterized by great strife among the black communities in Southern Africa, and would result in the Afrikaner's occupying the land around 1840. It was in 1855 that Marthinus Pretorius, a leader of the

Voortekkers named the then town after his father Andries Pretorius. Choosing to settle on the banks of the Apies rivier ('Monkeys river') he named it the new capital of the South African Republic. These surroundings were also the incarceration sites of many African kings and chiefs including Pedi Kgosi Mampuru who had been incarcerated with the Ndebele Khosi Nyabela, who had provided him asylum in these areas[3]. Throughout the colonial history of South Africa the Olievenhoutbosch was used as farming lands and has changed ownership a number of times.

After independence in 1992, Olievenhoutbosch was then established when Centurion was incorporated into Tshwane in 2000.Olievenhoutbosch is now a fast growing residential area and offers visitors interesting attractions. Some of the attractions are the famous koi fish-breeding farm and the Ndebele Cultural Centre[4].

[3] Amanda Esterhuysen(2007) The Archaeology of Mpumalanga. Univerity of Witwatersrand.
The Ndebele are a Nguni people, they originate from the present day KwaZulu-Natal. They first travelled with Abakwa Zelemu (AmaBhaca) to south kzn and later broke away and entered the Transval Their first known chief was Mafana. They proceeded to present day Mohlakeng (Mhlangeni) near Randfontein and continued to a place called Kwa-Mnyamana near Pretoria under the leadership of King Musi.

[4] https://showme.co.za/pretoria/tourism/townships-around-pretoria/
ShowMe (2008) Townships Around Pretoria : Accessed 16/04/2021
The Ndebele Cultural centre shows the Ndebele traditional way of life, i.e traditional ceremonies, Ndebele paintings, beadwork and Ndebele culture in general.



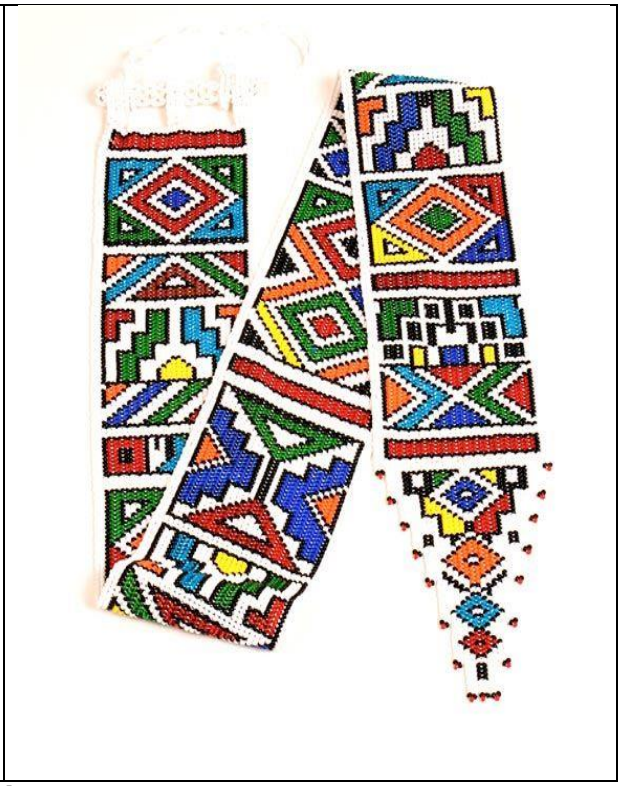


Figure 3: Images of different pieces of modified Ndebele Art[5]

5.7 Cultural Landscape Assessment of Significance

Significance is not absolute and can only be identified in relation to each individual development and its unique location. It is important that any assessment of significance adopts an informed and well-reasoned judgement, supported through a clear justification as to how the conclusions about significance for each effect have been derived. It should be emphasised that whilst this methodology is designed to be robust and transparent, professional judgement is ultimately applied to determine the level of significance applied to each effect.

The two principal criteria determining the significance of effects are the scale or magnitude of effect, and the cultural heritage sensitivity of the location or receptor. With regard to visual receptors, a **HIGH** significance of effect would be from **HIGH** sensitivity receptors such as Regional to National significance old buildings and heritage sites with a Local rating where they would receive a major change in the view. A low significance of effect would be from the least sensitive low significance old buildings and heritage sites with a Local rating would be affected for a smaller period of time as they would experience transient views. Where no change is identified the significance is assessed as

[5] https://za.pinterest.com/pin/503206958335068011/
Ndebele Bead work (2019) South Africa's Most Fashionable

neutral. These thresholds will be determined by combining sensitivity and magnitude, with reference to any general terminology accepted for the whole Heritage Impact Assessment.

5.8 Significance of Cultural Landscape Impacts

- *This project is given a Low adverse significance to the cultural landscape. This is due to the fact that the proposed development landscape has very minimal known cultural heritage significance. Given below is a table that shows the ICOMOS assessment of significance of cultural landscapes.*

Assessment of significance of the cultural landscape impacts ▪ Red cells represent significant adverse impacts ▪ Yellow cells represent significant beneficial impacts ▪ Blue cells represent impacts that are not significant			**Landscape receptor sensitivity**		
			High	**Medium**	**Low**
			Landscape with National heritage significance Status sites and cultural Landscapes with Provincial heritage Significance Status	**Regional or Local Significance Heritage sites valued characteristics reasonably tolerant of changes of the type proposed.**	**A relatively unimportant cultural landscape with few features of value or interest, potentially tolerant of substantial change of the type proposed.**
Magnitude of landscape impact	**Major adverse**	Significant adverse changes, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness for more than 2 years	High adverse significance	High/Medium adverse significance	Medium adverse significance
	Moderate adverse	Noticeable but not significant adverse changes for more than 2 years or significant adverse changes for more than 6 months but less than 2 years, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness.	High/Medium adverse significance	Medium adverse significance	Low adverse significance
	Slight adverse	Noticeable adverse changes for less than 2 years, significant adverse changes for less than 6 months, or barely discernible adverse changes for any length of time.	Medium adverse significance	Low adverse significance	Neutral
	Neutral	Any change would be negligible, unnoticeable or there are no predicted changes.	Neutral	Neutral	Neutral
	Slight benefit	Noticeable beneficial changes for less than 2 years, significant beneficial changes for less than 6 months, or barely discernible beneficial changes for any length of time.	Medium beneficial significance	Low beneficial significance	Neutral

Moderate benefit	Noticeable but not significant beneficial changes for more than 2 years or significant beneficial changes for more than 6 months but less than 2 years, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness.	High/Medium beneficial significance	Medium beneficial significance	Low beneficial significance
Major benefit	Significant beneficial changes, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness for more than 2 years	High beneficial significance	High/Medium beneficial significance	Medium beneficial significance

Figure 4: ICOMOS guideline for assessing significance of cultural landscape impacts

6.0 DISCUSSION OF THE FINDINGS

6.1 Assumptions and Limitations

- There is a possibility of direct impacts during the construction phase. The impacts would however be of very low significance. During this phase, the graves, and other heritage resources may be discovered. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.
- The preconstruction phase which usually involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase will less likely yield any archaeological artefacts.
- The methodology used in HIA is based on a comprehensive understanding of the current or baseline situation; the type, distribution and significance of heritage resources as revealed through desk-based study and additional data acquisition, such as archaeological investigations
- Iron Age settlements were expected on the stream banks as Iron Age communities are known to have settled along the river banks.
- The Public Participation Process will be conducted by the EAP.

6.2 Findings

Our visit to the site noted that no development activities associated with the proposed project had begun at the time, in accordance with National and Provincial heritage legislation, a summary table of the heritage resources assessed, and observed is given below;

HERITAGE RESOURCE TYPE	OBSERVATION
Cultural landscapes and Historic buildings	None were identified within the proposed
Living Heritage Shrines and Sites	None were identified within the proposed
Geological and Palaeontological sites of scientific or cultural	None were identified within the proposed
Archaeological sites	None were identified within the proposed
Graves and Burial grounds	None were identified within the proposed
Public Monuments and Memorials	None were identified within the proposed
Battlefields	None were identified within the proposed

The survey undertaken consisted of surface reconnaissance and systematic cultivated areas (open pit investigation) along the stream banks. We expected to come across archaeological artefacts such as potsherds and Iron Age fragment associated with the historic agro-pastoralist communities as Iron Age communities were known to settle close to the river bank. This survey was a non-destructive method of surface survey which was used in combination with other (non-destructive) prospection method, e.g. photography, fault line inspection, rock inspection and so on.

Figure 5: View of bridge number four (4)

Figure 6: View of bridge four from Orefile primary school direction

Figure 7: Overview landscape of the proposed bridge 4 site

Figure 8: View of bridge one (1). Note the water pipers that were either meant for a proposed development or removed from an old development

Figure 9: View of the pipeline route from bridge 1

Figure 10 : A view of part of the pipeline route

Figure 11: View of bridge two (2)

Figure 12: View of some of the power lines traversing across and along the proposed development site

Figure 13: A view of bridge number three (3)

Figure 14: Vegetation cover along bridge three (3)

6.3 General observations

- The overall study area is populated by shacks and government RDP houses.
- Sewerage pipes are no longer functional probably because of over population.
- The area's hygienic conditions are very poor.
- Most parts of the general study area do not have tarred roads.
- According to consulted oral sources the study area's grave yards is located in Forest hill a few kilometres away from the study area.

7.0 HERITAGE ASSESSMENT OF SIGNIFICANCE

Site significance classification standards prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purposes of this report.

- The main aim in assessing significance is to produce a succinct statement of significance, which summarises an item's heritage values. The statement is the basis for policies and management structures that will affect the item's future.

Table 3: SAHRA's Site Significance classification minimum standards

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

Site significance is calculated by combining the following concepts in the given 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:

Table 4: The significance weightings for each potential impact

ASPECT	DESCRIPTION	WEIGHT
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8

Table 5: Impact of Significance

IT PROVIDES AN INDICATION OF THE IMPORTANCE OF THE IMPACT IN TERMS OF BOTH TANGIBLE AND INTANGIBLE CHARACTERISTICS. (S) IS FORMULATED BY ADDING THE SUM OF NUMBERS ASSIGNED TO EXTENT (E), DURATION (D), AND INTENSITY (I) AND MULTIPLYING THE SUM BY THE PROBABILITY. S= (E+D+M) P		
<30	Low	Mitigation of impacts is easily achieved where this impact would not have a direct influence on the decision to develop in the area.
30-60	Medium	Mitigation of impact is

		both feasible and fairly easy. The impact could influence the decision to develop in the area unless it is effectively mitigated.
>60	High	Significant impacts where there is difficult. The impact must have an influence on the decision process to develop in the area.
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
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low(2)
Probability	Not Probable (2)	Not probable (2)
Significance	Low (16)	Low(16)
Status	Negative	Negative
Reversibility	Not irreversible	Not irreversible
Irreversible 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: Impacts are rated as <30 (Low) Mitigation of impacts is easily achieved where this impact would not have a direct influence on the decision to develop in the area. Due to the lack of apparent significant heritage resources no further mitigation is required prior to construction. A Chance Find Procedure should be implemented for the project should any sites be identified during the construction process.		

6.2 Conclusions

- *This report is an independent view and makes recommendations to Amafa Research Institute based on its findings. The authority will consider the recommendations and make a decision based on conservation principles.*

- ***Stone Age sites***

No Stone Age settlements, structures, features, assemblages or artefacts were recorded during the survey.

- ***Rock art sites***

Although several rock art sites are known in the general region, none were recorded near the survey area.

- ***Iron Age Settlements***

Though envisaged due to the site's close proximity to the stream, no Iron Age sites or features were recorded in the survey footprint.

6.3 Recommendations

The proposed development may proceed as there is no objection from a heritage perspective. It is the reasoned opinion of the author of this report that no visible material remains pertaining to heritage resources occur within the proposed development footprint. Subject to adherence of the recommendations and approval by Amafa Research Institute the proposed development may be allowed to continue under the following conditions;

- Should skeletal or archaeological remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted.
- Section 36 (6) of the National Heritage and Resources Act, 25 of 1999 also states that should culturally significant material be discovered during the course of the said development, all activities must be suspended pending further investigation by a qualified archaeologist.

8.0 REFERENCES

- AFRICA, BIGEN. "EXCELLENCE IN ROAD INFRASTRUCTURE." *IMIESA* (2011): 43.
- Clark, K., 2001. Planning for the past: heritage services in local planning authorities in England. Cultural trends, 11(43-44), pp.61-94.
- Glasson, J. et al. (2012), Introduction to Environmental Impact Assessment: Principles and Procedures, Process, Practice and Prospects, Oxon: Routledge.
- Glasson, J. and Therivel, R., 2013. Introduction to environmental impact assessment. Routledge.
- Morgan, R.K. (2012), "Environmental impact assessment: the state of the art", Impact Assessment and Project Appraisal, 30(1), pages 5-14
- Maggs, T.M.O'C. 1976. Iron Age Communities of the southern Highveld. Occasional Publications No. 2.Pietermaritzburg: Natal Museum.
- Mason, R.J. 1986. Origins of the Black People of Johannesburg and the southern western central Transvaal AD 350-1880. Occasional Paper No. 16. Johannesburg: Archaeological Research Unit, University of the Witwatersrand.
- Pelser, A. J. (2012). A Report on a Heritage Impact Assessment (AIA) for the Proposed Photo-Voltaic Solar Power Generation Plant on the farm Adams 328 near Hotazel in The Northern Cape. Unpublished Report Archaetnos cc AE01220P.
- Huffman, T.N. 1993. Broederstroom and the Central Cattle Pattern. South African Journal of Science 89:220-226.
- Van Schalkwyk, J. 2005. Heritage impact assessment for the Vaal River eastern sub-system augmentation project, Gauteng and Mpumalanga. Unpublished report 2005KH58. Pretoria: National Cultural History Museum.
- Pistorius, J.C.C. 2004. A heritage impact assessment (HIA) study for the proposed new Optimun Colliery on the farm Schoonoord 164IS in the Mpumalanga Province of South Africa. Unpublished report: Pretoria.

APPENDIX A: DEFINITION OF TERMS ADOPTED IN THIS HIA

- **The terminology adopted in this document is mainly influenced by the NHRA of South Africa (1999) and the Burra Charter (1979).**

Adaptation: Changes made to a place so that it can have different but reconcilable uses.

Artefact: Cultural object (made by humans).

Buffer Zone: Means an area surrounding a cultural heritage which has restrictions placed on its use or where collaborative projects and programs are undertaken to afford additional protection to the site.

Co-management: Managing in such a way as to take into account the needs and desires of stakeholders, neighbours and partners, and incorporating these into decision making through, amongst others, the promulgation of a local board.

Conservation: In relation to heritage resources, includes protection, maintenance, preservation and sustainable use of places or objects so as to safeguard their cultural significance as defined. These processes include, but are not necessarily restricted to preservation, restoration, reconstruction and adaptation.

Contextual Paradigm: A scientific approach which places importance on the total context as catalyst for cultural change and which specifically studies the symbolic role of the individual and immediate historical context.

Cultural Resource: Any place or object of cultural significance

Cultural Significance: Means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance of a place or object for past, present and future generations.

Feature: A coincidental find of movable cultural objects.

Grading: The South African heritage resource management system is based on a grading system, which provides for assigning the appropriate level of management responsibility to a heritage resource.

Heritage Resources Management: The utilization of management techniques to protect and develop cultural resources so that these become long term cultural heritage which are of value to the general public.

Heritage Resources Management Paradigm:A scientific approach based on the Contextual paradigm, but placing the emphasis on the cultural importance of archaeological (and historical) sites for the community.

Heritage Site Management: The control of the elements that make up the physical and social environment of a site, its physical condition, land use, human visitors, interpretation etc. Management may be aimed at preservation or, if necessary at minimizing damage or destruction or at presentation of the site to the public.

Historic: Means significant in history, belonging to the past; of what is important or famous in the past.

Historical: Means belonging to the past, or relating to the study of history.

Maintenance: Means the continuous protective care of the fabric, contents and setting of a place. It does not involve physical alteration.

Object: Artefact (cultural object)

Paradigm: Theories, laws, models, analogies, metaphors and the epistimatological and methodological values used by researchers to solve a scientific problem.

Preservation: Refers to protecting and maintaining the fabric of a place in its existing state and retarding deterioration or change, and may include stabilization where necessary. Preservation is appropriate where the existing state of the fabric itself constitutes evidence of specific cultural significance, or where insufficient evidence is available to allow other conservation processes to be carried out.

Protection: With reference to cultural heritage resources this includes the conservation, maintenance, preservation and sustainable utilization of places or objects in order to maintain the cultural significance thereof.

Place : Means a geographically defined area. It may include elements, objects, spaces and views. Place may have tangible and intangible dimensions.

Reconstruction: To bring a place or object as close as possible to a specific known state by using old and new materials.

Rehabilitation: The repairing and/ or changing of a structure without necessarily taking the historical correctness thereof into account.

Restoration: To bring a place or object back as close as possible to a known state, without using any new materials.

Site: A large place with extensive structures and related cultural objects. It can also be a large assemblage of cultural artefacts, found on a single location.

Sustainable: Means the use of such resource in a way and at a rate that would not lead to its long-term decline, would not decrease its historical integrity or cultural significance and would ensure its continued use to meet the needs and aspirations of present and future generations of people.

APPENDIX B: DEFINITION OF VALUES

Value	Definition

Historic Value	Important in the community or pattern of history or has an association with the life or work of a person, group or organization of importance in history.
Scientific Value	Potential to yield information that will contribute to an understanding of natural or cultural history or is important in demonstrating a high degree of creative or technical achievement of a particular period
Aesthetic Value	Important in exhibiting particular aesthetic characteristics valued by a community or cultural group.
Social Value	Have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
Rarity	Does it possess uncommon, rare or endangered aspects of natural or cultural heritage
Representivity	Important in demonstrating the principal characteristics of a particular class of natural or cultural places or object or a range of landscapes or environments characteristic of its class or of human activities (including way of life, philosophy, custom, process, land-use function, design or technique) in the environment of the nation, province region or locality.

APPENDIX C: RESOURCE LIKELY TO OCCUR WITHIN THESE CONTEXTS AND LIKELY SOURCES OF HERITAGE IMPACTS/ISSUES

HERITAGE CONTEXT	HERITAGE RESOURCES	SOURCES OF HERITAGE

		IMPACTS/ISSUES
A. PALAEONTOLOGICAL LANDSCAPE CONTEXT	Fossil remains. Such resources are typically found in specific geographical areas, e.g. the Karoo and are embedded in ancient rock and limestone/calcrete formations.	Road cuttings Quarry excavation
B. ARCHAEOLOGICAL LANDSCAPE CONTEXT NOTE: Archaeology is the study of human material and remains (by definition) and is not restricted in any formal way as being below the ground surface.	Archaeological remains dating to the following periods: ▪ ESA ▪ MSA ▪ LSA ▪ LSA - Herder ▪ Historical ▪ Maritime history	▪ Subsurface excavations including ground leveling, landscaping, foundation preparation. ▪ In the case of maritime resources, development including land reclamation, harbor/marina/water front developments, marine mining, engineering and salvaging.
	Types of sites that could occur include: ▪ Shell middens	
	▪ Historical dumps	
	▪ Structural remains	
C. HISTORICAL BUILT URBAN LANDSCAPE CONTEXT	• Historical townscapes/streetscapes. • Historical structures; i.e. older than 60 years • Formal public spaces. • Formally declared urban conservation areas. • Places associated with social identity/displacement.	A range of physical and land use changes within this context could result in the following heritage impacts/issues: • Loss of historical fabric or layering related to demolition or alteration work. • Loss of urban morphology related to changes in patterns of subdivision and incompatibility of the scale, massing and form of new development. • Loss of social fabric related to processes of gentrification and urban renewal.

APPENDIX D: CURRICULUM VITAE OF AUTHOUR

ROY MUROYI

ARCHAEOLOGY & HERITAGE SPECIALIST

AREAS OF SPECIALITY

- Iron Age archaeology
- Colonial archaeology
- Industrial Archaeology
- Grave relocations
- Human Skeletal remains analysis

WORK EXPERIENCE (SEVEN YEARS)

- **Tsimba Archaeological Footprints (Pty) Ltd | Current Director**
  - Heritage Impact Assessment compilation
  - Archaeological excavations
  - Human Skeletal analysis
  - Compliance with National Heritage & Environmental law
  - Geological Information systems work

- **G& A Heritage Consultants | 2018 | Field Technician**
- **Cape Archaeological Survey|2017|Field Technician**
- **Vhubvo ArchaHeritageConsultantsArchaeologist|2017**
- **NGT Holdings |Archaeologist |2016**
- **Time Line Consulting Botswana |Field Technician**
- **National Museums & Monuments of Botswana Salvage Archaeology| 2013**

CAREER OVERVIEW

I am a flexible, creative, hard-working and professionally minded archaeologist with realistic methods, who always aims to produce only the best results. I have been involved in grave relocation projects, experience in compiling Heritage Impact Assessments, and Conservation Management Plans Eco-Tourism Impact Assessments . I have also gained experience in Community Engangement for major developmental projects.

ACADEMIC ACHIEVEMENTS

MA. Heritage Studies (Candidate) -University of Witwatersrand

MA. CDS (with specialization in African Archaeology)- University of Witwaterand

BA.Hon. Archaeology, Cultural Heritage and Museum Studies- Midlands State University

Certificate in Applied anatomy and biological anthropology training program -University of Cape Town

CONTACT INFO

Personal Phone: + (27) 081 3 717 993
+ (27) 061 9125118
Email: info@tsimba-arch.co.za
rmuroyi23@gmail.com
Address: 714 Legae Building
219 Bree, Street Johannesburg, CBD
Facebook: Roy Muroyi

CHARACTER REFERENCES

Dr. Phenyo.C. Thebe
Archaeologist and Senior Lecturer
University of Botswana

SELECTED CRM PROJECTS UNDERTAKEN

GRAVE RELOCATION

- The Black river historical burials exhumation project: - I exhumed over 500 historical burials during a historical burial site grave relocation project at the Black River Cemetery in Athlone , Cape Town.2500 historical burials were repatriated on the entire site.

HERITAGE IMPACT ASSESSMENTS

- HIA of the proposed construction of the Mpumalanga Sizakala Centre (Mpumalanga), KZN
- Heritage Impact assessment for the proposed construtcion of Empangweni Sports Facility in Inkosilangalibalele, KZN
- HIA for the proposed construction of a new Local Road 3296 (Mathunzaneni),
- HIA for the proposed Construction of new Local Road 3392 (UGOMBA), KZN
- HIA for the proposed upgrade of local road 3494 (Donsamehlo) to gravel, KZN
- Heritage Impact Assessment study (and alteration permits with PHRAG) for the proposed Hillcrest primary school ,Kensington Gauteng province, South Africa
- Heritage Impact Assessment report for the proposed Roodepoort train station upgrade
- Conservation Management Plan for the Irish DOD Garrison-author
- Heritage Impact Assessment report for the proposed Modimolle bulk water supply and storage reservoir, Modimolle, Limpopo province
- Heritage Impact Assessment study (and alteration permits with PHRA-G) for the proposed Thubelihle junior secondary school upgrade BID, Soweto, Gauteng province, South Africaauthor
- Archaeological and Cultural heritage phase I EIA specialist report for the proposed construction of 400kv powerline from Foskor substation (Phalaborwa) substation to Spencer substation (near Giyani) and Spencer MTS upgrading located within the jurisdiction of Greater Letaba, Maruleng, Greater Tzaneen, and Ba-Phalaborwa local municipality of Mopani district municipality of Limpopo province
- Eco-Tourism Impact Assessment specialist report for the proposed construction of 400kv powerline from Foskor substation (Phalaborwa) substation to Spencer substation (near Giyani) and Spencer MTS upgrading located within the jurisdiction of Greater Letaba, Maruleng, Greater Tzaneen, and Ba-Phalaborwa local municipality of Mopani district municipality of Limpopo province
- Environmental Impact Assessment for the Kgapamadi ward in Gantsi: 54 beds hotel at plot 8641 – Ghanzi
- Archaeological Impact Assessment for Botswana Defence forces camp in Kazungula-co-author
- Archaeological Impact Assessment for Gantsi District filling station
- Phase I Heritage Impact Assessment for The proposed Psychiatric rehabilitation clinic on portion 26899 of the farm Sterkloop 688 Is within Polokwane local municipality of Capricon District municipality Limpopo province
- Heritage Impact Assessment for The proposed bulk water pipeline from Sefofotse to Maphalle within Greater Letaba municipal area of Mopani district in the Limpopo province
- Heritage Impact Assessment forming part of the Environmental Impact Assessment for the selection for the proposed location of waste disposal for the Medupi power station FGD retrofit project near Lephalale, Limpopo province, South Africa

- Cultural Heritage Management Plan (CHMP) for the construction of a residential township in relation to the noted graves on remainder of the Farm Fouriestrust 2525 District in the Mangaung Metropolitan Municipality of Free State Province-co-author
- A phase 1 Archaeological Impact Assessment for the proposed mining operations on farm Laezonia 317jq, Centurion Municipality, Gauteng Province
- The 24 Degrees Latitude, an exhibition project of the Southern Region of Botswana's Iron Age Archaeology for the Kgosi Bathoen II Museum
- Cultural Resources Management Plan for the farm airstrip of the President of the Republic of Botswana His excellence Lt General Seretse Khama I an Khama II on behalf of the Botswana Defence Forces
- The Great Gaborone trail; tracing the old buildings of Gaborone
- The David Livingstone trail, from Botswana to Livingston Zambia
- The 100 Monuments project; Resuscitating the 100 National monuments suggested by the President of the Republic of Botswana His excellence Lt General Seretse Khama I an Khama