Vhubvo Archaeo-Heritage Consultants Cc
Registration No.:2010/090598/23
VAT No.: 4960270322

546 16th road, Building no 2
Constantia Park, Midrand
Tel: 011 312 2878
Cell: 082 535 6855
Fax: 011 312 7824
info@vhubvo.co.za

Office No. 25
Bindulavhuthu Complex
Thohoyandou CBD, 0950
P.O. Box 696; Sibasa; 0970
Tel/Fax: 015 9625 742

KIMOPAX (PTY) LTD

PHASE I ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT SPECIALIST REPORT FOR THE PROPOSED MINING RIGHT APPLICATION FOR VANADIUM, TITUNIUM AND IRON ORE ON PORTION (S) OF THE FARM (S) WILDEBEESTKUIL 7 JQ, AND PORTION OF FARM MAGAZYNSKRAAL 3 JQ, HAAKDOORN 6 JQ, SYFERKUIL 9 JQ AND MIDDELKUIL 8 JQ WITHIN MOSES KOTANE LOCAL MUNICIPALITY OF BOJANALA DISTRICT MUNICIPALITY IN THE NORTH WEST PROVINCE.

January, 2019

DMR REFERENCE NUMBER: NW 30/5/1/2/2/10147MR

©COPYRIGHT

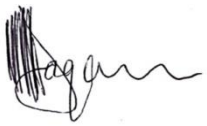
DECLARATION

ABILITY TO CONDUCT THE PROJECT

Munyadziwa Magoma is a professional archaeologist, having obtained his BA degree in Archaeology and Anthropology at University of South Africa (UNISA), an Honours degree at the University of Venda (UNIVEN), and a Master's degree at the University of Pretoria (UP). He is an accredited Cultural Resource Management (CRM) member of the Association for southern African Professional Archaeologists (ASAPA) and Amafa aKwaZulu-Natali. Munyadziwa is further affiliated to the South African Archaeological Society (SAAS), the Society of Africanist Archaeologists (SAfA), and the International Council of Archaeozoology (ICAZ). He has more than ten years' experience in heritage management, having worked for different CRM organisations and government heritage authorities. As a CRM specialist, Munyadziwa has completed well over five hundred Archaeological Impact Assessments (AIA) for developmental projects situated in all provinces of the Republic of South Africa. The AIAs projects he has been involved with are diverse, and include the establishment of major substation, upgrade and establishment of roads, establishment and extension of mines. In addition, he has also conducted Heritage Impact Assessments (HIAs) for the alteration to heritage buildings and the relocation of graves. His detailed CV is available on request.

AUTHOR AND CONTACT DETAILS:

Munyadziwa Magoma,



Cell: 082 535 6855
Tel: 011 312 2878
Fax: 086 566 8079
E-mail: munyadziwa@vhubvo.co.za

CLIENT CONTACT DETAILS:

- Kimopax

Charles Chigurah,
Tel: 011 312 9765
Fax: 011 312 9768
E-mail: CHARLES@kimopax.com

Acknowledgements

The author and the team of Vhubvo would like to acknowledge Kimopax official for their assistance in relation to the conduction of this project. In particular, community members, Mr Manyako and Mr. Tshabalala as well as the staffs of NASA are also thanked greatly.

EXECUTIVE SUMMARY

Vhubvo Archaeo-Heritage Consultant Cc has been commissioned by Kimopax to conduct the Cultural Heritage Impact Assessment (HIA) Study for the proposed mining right of Vanadium, Titanium and Iron Ore in terms of the Section 25 of the National Heritage Resource Act (Act 25 of 1999) within Moses Kotane Local Municipality of Bojanala District Municipality in the North West Province. The aim of the survey was to investigate the availability of archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structures of historical significance that may be affected by the proposed mining and related facilities, these will in turn assist the developer in ensuring proper conservation measure in line with relevant Acts. The findings of this study have been informed by desktop study and field survey. The desktop study was undertaken through SAHRIS for previous Cultural Heritage Impact Assessments conducted in the region of the proposed development, and also for researches that have been carried out in the wider area over the past years.

Receiving Environment

The proposed development is located within the jurisdiction of Moses Kotane Local Municipality in the North West Province. The area is currently used for various purposes related to farming. The land on which mining is proposed is thus transformed and no archaeological materials are expected. The locality map provided indicates the proposed study area.

Impact statement

The impact of the proposed mining on archaeological and cultural heritage remains is rated as being low. The probability of locating any important archaeological remains during development of the project is unlikely. However, there is always a possibility of encountering grave site(s) in the proposed area, though unlikely.

Restrictions and Assumptions

As with any survey, archaeological materials may be under the surface and therefore unidentifiable to the surveyor until they are exposed once construction resume. As a result, should any archaeological/ or grave site be observed during construction stage, a heritage specialist monitoring the development must immediately be notified. In the meantime, no further disturbance may be made until such time as the heritage specialist has been able to make an assessment of the find in question. It is the responsibility of the contractor to protect the site from publicity (i.e., media) until all assessments are made.

Table 1: Possibility of archaeological/ heritage materials on sites.

Landscape type	Description	Occurrence still possible	Likely occurrence
Archaeology	Early, Middle and Late Stone Age; Iron Age.	Yes Yes	Rather unlikely Unlikely
Burial and Graves	Pre-colonial burials; Graves of victims of conflict; Graves older than 100 years; Graves older than 60 years; Graves younger than 60 years.	Yes	Chance find
Built Environment	Formal public spaces; Historical structures; Area associated with social identity/ displacement;	Yes	Unlikely
Historic Farmland	Historical farm yards; Historical farm workers villages; Irrigation furrows; Historical routes; Distinctive types of planting.	Yes	Unlikely
Landscape usage	Sites associated with living heritage e.g., initiation school sites; Sites of political conflict; Sites associated with a historic event/ person.	Yes	Unlikely
Historic rural Town	Historic mission settlements.	Yes	Unlikely

Survey Sensation

The visibility of all area proposed for mining and related activities was high, emancipating in the successful survey.

Survey Findings

The Phase I Archaeological and Cultural Heritage Impact Assessment for the proposed mining right of Vanadium, Titanium and Iron Ore has identified no significant impacts to archaeological or grave resources that will need to be mitigated prior construction. The structure which was noted on the area proposed for blasting is less than 60 years and not protected by the National Heritage Resource Act. Therefore, no archaeological or cultural heritage mitigation measures are required in order for the proposed mining right to commence.

Recommendations and Discussions

Despite that no archaeological objects were observed during the survey, and that the area is disturbed, the client is reminded that unavailability of archaeological material does not mean absentee, archaeological material might be hidden underground. It is thus the responsibility of the developer to notify contractors and workers about archaeological material (e.g., pottery, stone tools, remnants of stone-walling, graves, etc)

and fossils that may be located underground. Furthermore, the client is reminded to take precautions during construction.

Pre-mining education and awareness training

Prior to mining, workers should be given training on how to identify and protect archaeological remains that may be discovered during project. The pre-construction training should include some limited site recognition training for the types of archaeological sites that may occur in the construction areas. Below are some of the indicators of archaeological site that may be found during construction:

- Flaked stone tools, bone tools and loose pieces of flaked stone;
- Ash and charcoal;
- Bones and shell fragments;
- Artefacts (e.g., beads or hearths);
- Packed stones which might be uncounted underground, and might indicate a grave or collapse stone walling.

In the event that any of the above are unearthed, all construction within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or SAHRA officer should be contacted immediately. In the meantime, it is the responsibility of the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached. Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA.

Conclusions

A thorough background study and survey of the proposed development was conducted in line with SAHRA guidelines. As per the recommendations above, there are no heritage reasons why the proposed development could not be allowed to proceed. It is thus recommended that the proposed mining proceed without further archaeological and cultural heritage mitigation.

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

AIA	Archaeological Impact Assessment
EMP	Environmental Management Plan
HIA	Heritage Impact Assessment
LIA	Late Iron Age
MIA	Middle Iron Age
EIA	Early Iron Age
HMP	Heritage Management Plan
LSA	Late Stone Age
MSA	Middle Stone Age
ESA	Early Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Agency

GLOSSARY OF TERMS

The following terms used in this Archaeology are defined in the National Heritage Resources Act [NHRA], Act Nr. 25 of 1999, South African Heritage Resources Agency [SAHRA] Policies as well as the Australia ICOMOS Charter *(Burra Charter)*:

Archaeological Material: remains resulting from human activities, which are in a state of disuse and are in, or on, land and which are older than 100 years, including artifacts, human and hominid remains, and artificial features and structures.

Artefact: Any movable object that has been used, modified or manufactured by humans.

Conservation: All the processes of looking after a site/heritage place or landscape including maintenance, preservation, restoration, reconstruction and adaptation.

Cultural Heritage Resources: refers to physical cultural properties such as archaeological sites, palaeolontological sites, historic and prehistorical places, buildings, structures and material remains, cultural sites such as places of rituals, burial sites or graves and their associated materials, geological or natural features of cultural importance or scientific significance. This include intangible resources such religion practices, ritual ceremonies, oral histories, memories indigenous knowledge.

Cultural landscape: "the combined works of nature and man" and demonstrate "the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both internal and external".

Cultural Resources Management (CRM): the conservation of cultural heritage resources, management, and sustainable utilization and present for present and for the future generations

Cultural Significance: is the aesthetic, historical, scientific and social value for past, present and future generations.

Chance Finds: means Archaeological artefacts, features, structures or historical cultural remains such as human burials that are found accidentally in context previously not identified during cultural heritage scoping, screening and assessment studies. Such finds are usually found during earth moving activities such as water pipeline trench excavations.

Compatible use: means a use, which respects the cultural significance of a place. Such a use involves no, or minimal, impact on cultural significance.

Conservation means all the processes of looking after a place so as to retain its cultural significance.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

Grave: A place of interment (variably referred to as burial), including the contents, headstone or other marker of such a place, and any other structure on or associated with such place.

Heritage impact assessment (HIA): Refers to the process of identifying, predicting and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project, plan, programme or policy which requires authorisation of permission by law and which may significantly affect the cultural and natural heritage resources. The HIA includes recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Historic Material: remains resulting from human activities, which are younger than 100 years, but no longer in use, including artifacts, human remains and artificial features and structures.

Impact: the positive or negative effects on human well-being and / or on the environment.

***In situ* material:** means material culture and surrounding deposits in their original location and context, for instance archaeological remains that have not been disturbed.

Interested and affected parties Individuals: communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by the proposal or activity and/ or who are concerned with a proposal or activity and its consequences.

Interpretation: means all the ways of presenting the cultural significance of a place.

Late Iron Age: this period is associated with the development of complex societies and state systems in southern Africa.

Material culture means buildings, structure, features, tools and other artefacts that constitute the remains from past societies.

Mitigate: The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.

Place: means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

Protected area: means those protected areas contemplated in section 9 of the NEMPAA and the core area of a biosphere reserve and shall include their buffers.

Public participation process: A process of involving the public in order to identify issues and concerns, and obtain feedback on options and impacts associated with a proposed project, programme or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific matters.

Setting: means the area around a place, which may include the visual catchment.

Significance: can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgments and science-based criteria (i.e. biophysical, physical cultural, social and economic).

Site: a spatial cluster of artifact, structures, organic and environmental remains, as residues of past human activity.

1. Introduction

At the request of Kimopax, Vhubvo Archaeo-Heritage Consultant Cc conducted Phase I Archaeological and Cultural Heritage Impact Assessment for the proposed mining right of Vanadium, Titanium and Iron Ore within Moses Kotane Local Municipality of Bojanala Platinum District in North West Province. The survey was conducted in accordance with the SAHRA Minimum Standards for the Archaeology and Palaeontology. The minimum standards clearly specify the required contents of the report of this nature. The study aim to identify and document archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structure of historical significance that may be affected by the proposed construction, these will in turn assist the developer in ensuring proper conservation measure in line with the National Heritage Resource Act, 1999 (Act 25 of 1999).

2. Sites location and description

The Matai Mining Project is located in the Moses Kotane Local Municipality of Bojanala Platinum District Municipality in the North West Province. It lies about 10km south from the closest town of Northam, and is bordered by Pilanesberg Mines in the west (approx. 8km from the project) and Siyanda Resources Union Mine in the north (approx. 5km from the project). The farms that will be affected by the proposal are Wildebeestkuil 7 JQ, and certain portions of these farms Magazynskraal 3 JQ, Haakdoorn 6 JQ, Syferkuil 9 JQ and Middelkuil 8 JQ. The area is currently used for various purposes related to farming. The land on which the development is proposed is thus transformed and no archaeological materials are expected. A locality map of the proposed project area is included as Figure 1.

Summary of Project Location Details

Province:	North West
Local Municipality:	Moses Kotane
District Municipality:	Bojanala Platinum
Proposed development:	Mining

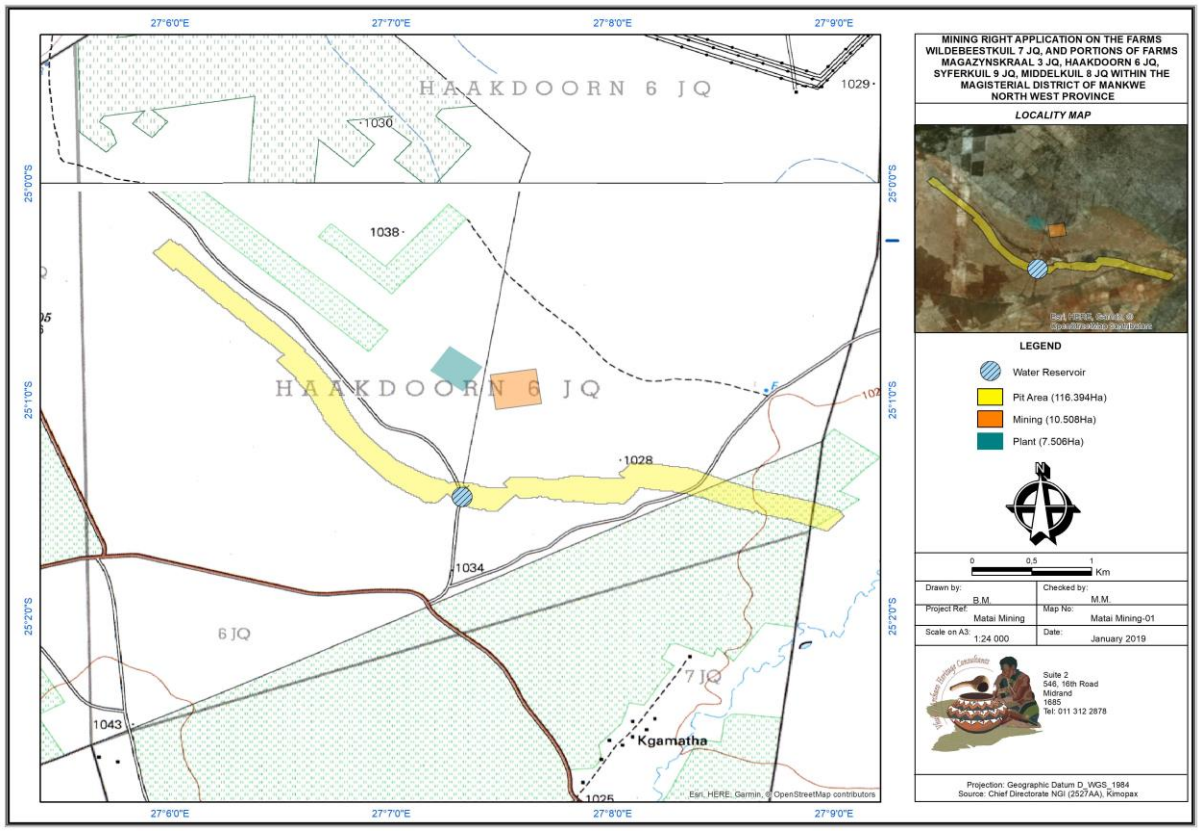


Figure 1: Topographical map of the area proposed for development.

Figure 2: An overview of the area proposed for blasting.

Figure 3: An overview of another section of the area proposed for blasting.

Figure 4: An overview of the area proposed for mining.

Figure 5: View of the north western section of the area proposed for mining

3. Nature of the proposed project

The proposed activities that Matai Mining is intending to undertake will include the excavation of an open cast mine. Datamine software was chosen to design the pit for the mine, to ensure that all waste within the ultimate pit can be accommodated throughout the life of Mine (LOM), a Waste Dump Design was completed. Apron Feeders will be utilised, as they deliver material at a uniform rate, which allows an optimal feeding to downstream equipment. Crushers will be used to reduce large rocks into smaller rocks, gravel, or rock dust. Conveyors will be used to transport material such as the ore and the overburden. It is assumed the water supply for the plant area will be obtained from the Municipal and other nearby water sources. The power supply will be supplied by Eskom. Gravel Surface roads will be constructed. For the purpose of administration, general buildings will be built.

4. Purpose of the Cultural Heritage Study

The purpose of this Archaeological and Cultural Heritage study was to entirely identify and document archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structure of historical significance that may be affected by the

proposed mining, these will in turn assist the developer in ensuring proper conservation measure in line with the National Heritage Resource Act, 1999 (Act 25 of 1999). Impact assessments highlight many issues facing sites in terms of their management, conservation, monitoring and maintenance, and the environment in and around the site. Therefore, this study involves the following:

- Identification and recording of heritage resources that maybe affected by the proposed mining;
- Providing recommendations on how best to appropriately safeguard identified heritage sites. Mitigation is an important aspect of any development on areas where heritage sites have been identified.

5. Methodology and Approach

Background study introduction

The methodological approach is informed by the 2012 SAHRA Policy Guidelines for impact assessment. As part of this study, the following tasks were conducted: 1) literature review, 2), consultations with the developer and appointed consultants, 3), completion of a field survey and 4), analysis of the acquired data, leading to the production of this report.

Physical survey

The field survey lasted two days of the 12th and 13th of December 2018. An archaeologist from Vhubvo accompanied by Kimopax officials and community members conducted the survey.

Documentation

The general project area was documented. This documentation included taking photographs using cameras a 10.1 mega-pixel Sony Cybershort Digital Camera. Plotting of finds was done by a Garmin etrex Venture HC.

Restrictions and Assumptions

As with any survey, archaeological materials may be under the surface and therefore unidentifiable to the surveyor until they are exposed once construction resume. As a result, should any archaeological/ or grave site be observed during construction, a heritage specialist must immediately be notified.

It is assumed that the Social Impact Assessment and Public Participation Process might also result in the identification of sites, features and objects, including sites of intangible heritage

potential in the corridors and that these then will also have to be considered in the selection of the preferred corridor. In addition, it is also assumed that a Visual Impact Assessment will be done to determine the impact of development on any identified heritage sites.

6. Applicable Heritage Legislation

Several legislations provide the legal basis for the protection and preservation of both cultural and natural resources. These include the National Environment Management Act (No. 107 of 1998); Mineral Amendment Act (No 103 of 1993); Tourism Act (No. 72 of 1993); Cultural Institution Act (No. 119 of 1998), and the National Heritage Resources Act (Act 25 of 1999). Section 38 (1) of the National Heritage Resources Act requires that where relevant, an Impact Assessment is undertaken in case where a listed activity is triggered. Such activities include:

(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; and

(c) any development or other activity which will change the character of an area of land, or water -

(i) exceeding 5 000 m² in extent;

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRAor a Provincial Heritage Resources Authority;

(d) the re-zoning of a site exceeding 10 000 m2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a Provincial Heritage Resources Authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of theproposed development.

Section 3 of the National Heritage Resources Act (25 of 1999) lists a wide range of national resources protected under the act as they are deemed to be national estate. When conducting a Heritage Impact Assessment (HIA) the following heritage resources have to be identified:

(a) Places, buildings structures and equipment of cultural significance

(b) Places to which oral traditions are attached or which are associated with livingheritage

(c) Historical settlements and townscapes

(d) Landscapes and natural features of cultural significance

(e) Geological sites of scientific or cultural importance

(f) Archaeological and paleontological sites

(g) Graves and burial grounds including-

(i) ancestral graves

(ii) royal graves and graves of traditional leaders

(iii) graves of victims of conflict

(iv) graves of individuals designated by the Minister by notice in the Gazette

(v) historical graves and cemeteries; and

(vi) other human remains which are not covered by in terms of the Human Tissue Act,1983 (Act No. 65 of 1983)

(h) Sites of significance relating to the history of slavery in South Africa

(i) moveable objects, including -

(i) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites andrare geological specimens

(ii) objects to which oral traditions are attached or which are associated withliving heritage

(iii) ethnographic art and objects

(iv) military objects

(v) objects of decorative or fine art

(vi) objects of scientific or technological interest; and

(vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

Section 3 of the National Heritage Resources Act (No. 25 of 1999) also 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 the following:

(a) Its importance in the community, or pattern of South Africa's history

(b) Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage

(c) Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage

(d) Its importance in demonstrating the principal characteristics of a particular classof South Africa's natural or cultural places or objects

(e) Its importance in exhibiting particular aesthetic characteristics valued by acommunity or cultural group

(f) Its importance in demonstrating a high degree of creative or technicalachievement at particular period

(g) Its strong or special association with a particular community or cultural group forsocial, cultural or spiritual reasons

(h) Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and

(i) Sites of significance relating to the history of slavery in South Africa.

Other sections of the Act with a direct relevance to the AIA are the following:

Section 34(1) *No person may alter or demolish any structure or part of a structure, which isolder than 60 years without a permit issued by the relevant provincial heritage resources authority.*

Section 35(4) *No person may, without a permit issued by the responsible heritage resources authority:*

- *destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite*

Section 36 (3) *No person may, without a permit issued by SAHRA or a provincial heritage resources authority:*

- *destroy, damage, alter, exhume, remove from its original position orotherwise disturb any grave or burial ground older than 60 yearswhich is situated outside formal cemetery administered by a localauthority; or*
- *bring onto or use at a burial ground or grave any excavationequipment, or any equipment which assists in detection or recovery ofmetals.*

7. Degree of Significance

This category requires a broad, but detailed knowledge of the various disciplines that might be involved. It must be borne in mind that the significance of a site from an archaeological perspective does not necessarily depend on the size of the site but more on the uniqueness of the site within a region. The following table is used to grade heritage resources.

Table 1: Grading systems for identified heritage resources in terms of National Heritage Resources Act (Act 25 of 1999).

Level	Significance	Possible action
National (Grade I)	Site of National Value	Nominated to be declared by SAHRA
Provincial (Grade II)	Site of Provincial Value	Nominated to be declared by PHRA
Local Grade (IIIA)	Site of High Value Locally	Retained as heritage
Local Grade (IIIB)	Site of High Value Locally	Mitigated and part retained as heritage
General Protected Area A	Site of High to Medium	Mitigation necessary before destruction
General Protected Area B	Medium Value	Recording before destruction
General Protected Area C	Low Value	No action required before destruction

Significance rating of sites

(i) High (ii) Medium (iii) Low

These categories relate to the actual artefact or site in terms of its actual value as it is found today, and refers more specifically to the condition that the item is in. For example, an archaeological site may be the only one of its kind in the region, and will thus be considered to be of high regional significance, however; should there be heavy erosion of the greater part of the site, its significance rating would be medium to low. The following are guidelines for the nature of the mitigation that must take place as Phase 2 of the project.

High

- This is a 'do not touch' situation, alternative must be sought for the project, examples would be natural and cultural landscapes like the Mapungubwe Cultural Landscape World Heritage Site, or the house in which John Langalibalele resided.

- Certain sites, or features may be exceptionally important, but do not warrant leaving entirely alone. In such cases, detailed mapping of the site and all its features is imperative, as is the collection of diagnostic artefactual material on the surface of the site. Extensive excavations must be done to retrieve as much information as possible before destruction. Such excavations might cover more than half the site and would be mandatory; it would also be advisable to negotiate with the client to see what mutual agreement in writing could be reached, whereby part of the site is left for future research.

Medium

- Sites of medium significance require detailed mapping of all the features and the collection of diagnostic artefactual material from the surface of the site. A series of test trenches and test pits should be excavated to retrieve basic information before destruction.

Low

- These sites require minimum or no mitigation. Minimum mitigation recommended could be a collection of all surface materials and/ or detailed site mapping and documentation. No excavations would be considered to be necessary.

In all the above scenarios, permits will be required from the South African Heritage Resources Agency (SAHRA) or the appropriate PHRA as per the legislation (the National Heritage Resources Act, no. 25 of 1999). Destruction of any heritage site may only take place when the appropriate heritage authority has issued a permit. The following table is used to determine rating system on the receiving environment.

Table 2: Rating and evaluating criteria of impact assessment

NATURE
Including a brief description of the impact of the heritage parameter being assessed in the context of the project. This criterion includes a brief written statement of the heritage aspect being impacted upon by a particular action or activity.
TOPOGRAPHICAL EXTENT

This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on a heritage parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.

2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which heritage resources will be irreplaceably lost as a result of proposed activity		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resource	The impact will result insignificant loss of resources.
4	Complete loss of resource	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impact on the heritage parameter. Duration indicates the lifetime of a result of the proposed activity.		

1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in span shorter than the construction phase (0-1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0-2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2-10 years).
3	Long term	The impact and its effects will continue or last for entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10-50 years).
4	Permanent	The only class of the impact that will non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		

This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects.
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects
3	Medium Cumulative Impact	The impact would result in minor cumulative effects
4	High Cumulative Impact	The impact would result in significant cumulative effects.
MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).

3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapsed). Rehabilitation and remediation often impossible .If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.

8. History of the Area

Stone Age

The larger region of the North West Province has been inhabited by humans since Early Stone Age (ESA) times. Most of the tools dating to this period are mostly, found in the vicinity of channels. The original dating and evolutionary scheme for the development of tools during this early period is based on a study of the river terrace gravels. The oldest of these tools are known as choppers, roughly produced from large pebbles found in the river. Later, *Homo erectus* and early *Homo sapiens* people made tools shaped on both sides, called bifaces. Biface technology is known as the Acheulean tradition, from St Acheul in France, where bifaces were first identified in the mid-19th century. This type of tools is very well presented in the Magaliesberge and to the north in the more mountainous regions.

The Middle Stone Age (MSA) times spanning to some (C. 150 000 – 30 000 BP) saw people became more mobile, occupying areas formerly avoided. The MSA is a period that still remains somewhat murky, as much of the MSA lies beyond the limits of conventional radiocarbon dating. However, the concept of the MSA remains useful as a means of identifying a technological stage characterized by flakes and flake-blades with faceted.

Open sites were still preferred near watercourses. These people were adept at exploiting the huge herds of animals that passed through the area, on their seasonal migration. As a result, tools belonging to this period also mostly occur in the open or in erosion dongas. Similar to the ESA material, artefacts from these surface collections are viewed not to be in a primary context and have little or no significance. Late Stone Age (LSA) people had even more advanced technology than the MSA people and therefore succeeded in occupying even more diverse habitats. Also, for the first time we now get evidence of people's activities derived from material other than stone tools. Ostrich eggshell beads, ground bone arrowheads, small bored stones and wood fragments with incised markings are traditionally linked with the LSA. LSA people preferred, though not exclusively, to occupy rock shelters and caves and it is this type of sealed context that make it possible for us to learn much more about them than is the case with earlier periods. Probably as a result of this absence of sites that were occupied on a long term basis, even fewer sites containing rock art are known from the region.

Iron Age

Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known site at Silver Leaves south east of Tzaneen dating to AD 270. One of the better known sites, Broederstroom, is located on the southern side of the Hartebeestpoort Dam. Here archaeological excavations have revealed that early farmer people were living here by AD 470, growing a range of different crops and that they were smelting iron. 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. Because of their specific technology and economy, Iron Age people preferred to settle on the alluvial soils near rivers for agricultural purposes, but also for firewood and water.

The occupation of the larger geographical area (including the study area) did not start much before the 1500s. To understand all of this, we have to take a look at the broader picture. Towards the end of the first millennium AD, Early Iron Age communities underwent a drastic change, brought on by increasing trade on the East African coast. This led to the rise of powerful ruling elites, for example at Mapungubwe. The abandonment of Mapungubwe (c. AD 1270) and other contemporaneous settlements show that widespread drought conditions led to the decline and eventual disintegration of this state Huffman (2005).

This period of consistently high rainfall started in about AD 1780. At the same time, maize was introduced from Maputo and grown extensively. Given good rains, maize crops yield far more than sorghum and millets. This increase in food production probably led to increased populations in coastal area as well as the central highveld interior by the beginning of the 19th century. This wet period came to a sudden end sometime between 1800 and 1820 by a major drought lasting 3 to 5 years. The drought must have caused an agricultural collapse on a large, subcontinent scale. This was also a period of great military tension. Armed Qriqua and Korana raiders on horseback were active in the Northern Cape and Orange Free State by about 1790. The Xhosa were raiding across the Orange River about 1805. 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. The Boers trekked into this area in the 1830s. Due to their specific settlement requirements, Late Iron Age people preferred to settle on the steep slope of a mountain, possibly for protection, or for cultural considerations such as grazing for their enormous cattle herds. Because of the lack of trees they built their settlements in stone.

Historical era

The local municipality in which the proposed project is proposed at was named in the memory of an activist who was born in the area. Moses M. Kotane was a General Secretary of the Communist Party of South Africa and Treasurer General of the African National Congress, born at Tamposstad in the Rustenburg district of the western Transvaal in 1905. Kotane came from a devoutly Christian peasant family of Tswana origin. Largely self-taught, he received only a few years of formal schooling, but became an insatiable reader. Later as a young worker he enrolled

in the Communist-run night school in Ferreirastown, Johannesburg, where he became known for his ability to master the most abstruse political writings.

In 1929 Kotane joined the Communist Party of South Africa (CPSA), and soon became both the vice-chairman of the trade union federation and a member of the party's political bureau. As one of the CPSA's most promising African recruits in a period when the party was promoting the goal of a Native Republic, Kotane was offered an opportunity to go to the Soviet Union, and for a year in the early 1930s he studied at the Lenin School in Moscow (South African History Online).

9. Survey Findings

The Phase I Archaeological and Cultural Heritage Impact Assessment for the proposed mining right of Vanadium, Titanium and Iron Ore has identified no significant impacts to archaeological or grave resources that will need to be mitigated prior construction. The structure which was noted (see Fig. 6) is less than 60 years and not protected by the National Heritage Resource Act. Therefore, no archaeological or cultural heritage remains were documented during the study.

9.1 Impact Assessment

Below is the impact rating. This rating is for archaeological and cultural heritage sites known to exist in the proposed area, and includes Stone and Iron Age, as well as Historical era materials. Note that these impacts are assessed as per Table 3 above:

Table 3: Anticipated impact rating.

Description	**Ratings**
Impact	N/A
Nature	Negative
Topographical Extent	The impact will only affect site
Duration	Long term
Magnitude	Low
Probability	Possible
Reversibility	N/A

Irreplaceable Loss	The impact will not result in the loss of any resources.

Figure 6: An overview of the structure noted on the area proposed for blasting.

10. Recommendations and Discussions

Despite that no archaeological objects were observed during the survey, and that the area is disturbed due to entertainment activities, the client is reminded that unavailability of archaeological material does not mean absentee, archaeological material might be hidden underground. It is thus the responsibility of the developer to notify contractors and workers about archaeological material (e.g., pottery, stone tools, remnants of stone-walling, graves, etc) and fossils that may be located underground. Furthermore, the client is reminded to take precautions during construction.

The exact locations (and co-ordinates) of related activities such as access roads are not yet available. This limitation makes it difficult to determine what the final impact of the proposed development would be like. Henceforth, I, as an independent archaeologist due recommend the following:

A heritage practitioner should complete a "walk down" once the access roads had been finalized. The walk down must happen prior to the start of any mining and construction activities. This walk down will document all sites, features and objects, in order to propose adjustments to the routes and thereby to avoid as many impacts to heritage as possible.

Pre-construction education and awareness training

Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the project. The pre-construction training should include some limited site recognition training for the types of archaeological sites that may occur in the construction areas. Below are some of the indicators of archaeological site that may be found during construction:

- Flaked stone tools, bone tools and loose pieces of flaked stone;
- Ash and charcoal;
- Bones and shell fragments;
- Artefacts (e.g., beads or hearths);
- Packed stones which might be uncounted underground, and might indicate a grave or collapse stone walling.

In the event that any of the above are unearthed, all construction within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or SAHRA officer should be contacted immediately. In the meantime, it is the responsibility of the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached. Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA.

11. Conclusions

A thorough background study and survey of the proposed development was conducted in line with SAHRA guidelines. As per the recommendations above, there are no major heritage reasons why the proposed development could not be allowed to proceed. Thus, it is recommended that the proposed development proceed without further archaeological and cultural heritage mitigation.

References

Cloete, P.G. 2000. The Anglo-Boer War: a chronology. Pretoria: JP van der Walt.

Coertze, RD. 1971. Die familie-, erf- en opvolgreg van die Bafokeng van Rustenburg. Pretoria: Sabra.

Coetzee, N.A. 1997. Die Geskiedenis van Rustenburg, ongeveer vanaf 1840 tot 1940. Pretoria: N.A.Coetzee.

De Jong, R.C. 2010. Revised heritage impact assessment report: installation of fibre optic cabling in the southern road reserve of the N 4 Bakwena Platinum Toll Road between the N 1 Toll Road and the Skilpadhek border post, Gauteng and North-west Provinces. Unpublished report, Cultmatrix cc, Pretoria.

Hall, S., Anderson, M. Boeyens, J & Coetzee, F. 2008. Towards an outline of the oral geography, historical identity and political economy of the Late Precolonial Tswana in the Rustenburg region. In Swanepoel, N. Esterhuysen, A. & Bonner, P. (eds.) 2008. Five Hundred Years Rediscovered: Southern African Precedents and Prospects. Johannesburg: Wits University Press. Pp 55-85.

Stoffberg, D.P. 1988. Argeologiese opgrawings van die Schoemansdalse Voortrekkerskans (distrik Louis Trichardt). Pretoria: Etnologiese diens, SA Leërhoofkwartier.

Van der Ryst, M.M. and Meyer, A. 1999. Die Ystertydperk. Bergh, J.S. (red.). Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies. Pretoria: J.L. van Schaik.

https://www.sahistory.org.za/people/moses-m-kotane

APPENDIX 1: SITE SIGNIFICANCE

The following guidelines for determining site *significance* were developed by SAHRA in 2003. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

(a) Historic value

- Is it important in the community, or pattern of history?
- Does it have strong or special association with the life or work of a person, group or organization of importance in history?
- Does it have significance relating to the history of slavery?

(b) Aesthetic value

- Is it important in exhibiting particular aesthetic characteristics valued by a community or cultural group?

(c) Scientific value

- Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage?
- Is it important in demonstrating a high degree of creative or technical achievement at a particular period?

(d) Social value

- Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons?

(e) Rarity

- Does it possess uncommon, rare or endangered aspects of natural or cultural heritage?

(f) Representivity

- Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects?
- What is the importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class?
- Is it important in demonstrating the principal characteristics of human activities

(including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality?