Phase 1 Cultural Heritage Impact Assessment:

THE PROPOSED DEVELOPMENT OF THE STEAMBOAT GRAPHITE PROJECT ON PORTIONS OF THE FARMS STEAMBOAT 305-MR AND INKOM 306-MR, BLOUBERG LOCAL MUNICIPALITY, CAPRICORN DISTRICT MUNICIPALITY, LIMPOPO PROVINCE

Prepared for:
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Prepared by:
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- Heritage Consultant: ASAPA Registration No.: 164 - Principal Investigator: Iron Age, Colonial Period, Industrial Heritage.
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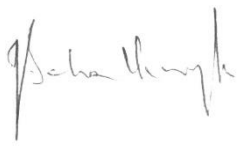
Report No: 2021/JvS/010

- Status: Final
- Date: April 2021
- Revision No: -
- Date: -

Submission of the report:
It remains the responsibility of the client to submit the report to the South African Heritage Resources Agency (SAHRA) or relevant Provincial Heritage Resources Agency (PHRA) by means of the online SAHRIS System.

Specialist competency:

Johan A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 40 years. Originally based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape Province, Northern Cape Province, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 70 papers, most in scientifically accredited journals. During this period, he has done more than 2000 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, roads, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.



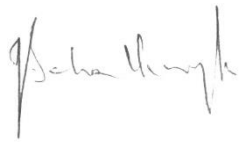
J A van Schalkwyk
Heritage Consultant
April 2021

SPECIALIST DECLARATION

I, J A van Schalkwyk, as the appointed independent specialist, in terms of the 2014 EIA Regulations (as amended), hereby declare that I:

- I act as the independent specialist in this application;
- I 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;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 (as amended) and any specific environmental management Act;
- 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 have no vested interest in the proposed activity proceeding;
- 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;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study 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



J A van Schalkwyk
April 2021

EXECUTIVE SUMMARY

Phase 1 Cultural Heritage Impact Assessment:
THE PROPOSED DEVELOPMENT OF THE STEAMBOAT GRAPHITE MINE ON PORTIONS OF THE FARMS STEAMBOAT 305-MR AND INKOM 306-MR, BLOUBERG LOCAL MUNICIPALITY, CAPRICORN DISTRICT MUNICIPALITY, LIMPOPO PROVINCE

Diphororo Development (Pty) Ltd was appointed to conduct the environmental impact assessment (EIA) for the proposed Steamboat Project. The project name, Steamboat Project, is related to the farm name "Steamboat". Cuchron holds a valid Prospecting Right No LP/5/1/1/2/10321PR for Graphite over the farm's Steamboat 306MR and Inkom 305MR, covering an area of 1,453 hectares, situated along the Mogalakwena River in the Province of Limpopo.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *Diphororo Development (Pty) Ltd* to conduct a cultural heritage assessment to determine if the establishment of the mining operations would have an impact on any sites, features or objects of cultural heritage significance.

This report describes the methodology used, the limitations encountered, the heritage features that were identified and the recommendations and mitigation measures proposed relevant to this. The HIA consisted of a desktop study (archival sources, database survey, maps and aerial imagery) and a physical survey that included the interviewing of relevant people. It should be noted that the implementation of the mitigation measures is subject to SAHRA/PHRA's approval.

The cultural landscape qualities of the region essentially consist of a rural setup. In this the human occupation is made up of a pre-colonial element consisting of limited Stone Age occupation and an extensive Late Iron Age occupation. This was followed by a much later colonial farmer component. Population increase over time led to the establishment of a large number of rural villages.

Limitations encountered

During the site visit, the high and dense vegetation that covered the project area limited ground visibility very much, even to the point of making the determination of buffer zones around identified sites impossible.

Identified sites

During the survey the following sites, features or objects of cultural significance were identified:

- 7.1.1: Stone Age artefacts, mostly dating to the Middle Stone Age occur in low numbers scattered in parts of the study area. The density of artefacts is less than 1/20m^2 overall. The tools are mostly made from quartzite. The tools are very poorly made and also shows a lot of weathering.

- 7.3.1: What seems to be a single grave, marked by a packed circle of stone and a small, different type of stone as headstone. It seems to be very old and no other signs of habitation could be detected.

- 7.3.2: A series of trenched and deep pits confined to a section where the open pit is planned. It is as yet impossible to attribute a definite date to this excavations. Some of the trenches are also much overgrown with trees and shrubs, indicating that they are quite old. According to local community members, they have been playing here since they were very young, implying that the mining took place prior to that, making possibly older than 60 years. However, it is also stated that

there were some exploration being done here in the late 1980s by Mintek and the South African Development Trust (Badenhorst 2019:126), although the extent of this exploration is not indicated.

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed mining activities is based on the present understanding of the project:

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.1.1	Chance find stone tools	Section 35	Generally protected 4B: Medium significance	Low (10) Low (4)
Mitigation: (5) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report. This is also applicable where the identified feature is located in such a position that the proposed development is unlikely to impact on the site.				

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.1	Burial site	Section 36	Generally protected 4A: High significance	Low (8) Low (8)
Mitigation: (1) Avoidance/Preserve: (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and the site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall) of 20m.				

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.2	Old mining features	Section 34	Generally protected 4B: Medium significance	Medium (56) Low (16)
Mitigation: (2) Archaeological investigation: Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist. This option should be implemented when it is impossible to avoid impacting on an identified site or feature.				

Legal requirements

- The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that sites, features or objects of heritage significance occur in the project area, therefore permits are required from SAHRA or the PHRA.

- If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

Reasoned opinion as to whether the proposed activity should be authorised:

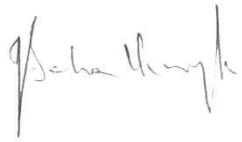
- From a heritage point of view, it is recommended that the proposed activities be allowed to continue on acceptance of the proposed mitigation measures and the conditions proposed below.

Conditions for inclusion in the environmental authorisation:

- The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that the project area has a moderate sensitivity of fossil remains to be found and therefore a desktop palaeontological assessment is required.

- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. The appropriate steps to take are indicated in Section 9 of the report, as well as in the **Management**

Plan: Burial Grounds and Graves, with reference to general heritage sites, in the Addendum, Section 12.4.



J A van Schalkwyk
Heritage Consultant
April 2021

TECHNICAL SUMMARY

Project description	
Description	Development of a graphite mine and ancillary facilities
Project name	Cuchron Graphite Mine & Steamboat Beneficiation Plant

Applicant
Steamboat Graphite & Cuchron

Environmental assessors
Ms L Dickson
Diphororo Development (Pty) Ltd

Property details						
Province	Limpopo					
Magisterial district	Bochum					
District municipality	Blouberg					
Topo-cadastral map	2228DD					
Farm name	Steamboat 306MR & Inkom 305MR					
Closest town	Alldays					
Coordinates	Centre point (approximate)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	S 22,83365	E 28,76563	2		
	.kml files[1]					

Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq m	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 sq m	No
Any other development category, public open space, squares, parks, recreation grounds	No

Land use	
Previous land use	Farming/Mining
Current land use	Farming

[1] Left click on the icon to open the file in Google Earth, if installed on the computer. Alternatively, right click on the icon. In dialog box, select "Save Embedded File to Disk" and save to folder of choice.

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Bioturbation: The burrowing by small mammals, insects and termites that disturb archaeological deposits.

Cumulative impacts: "Cumulative Impact", in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Debitage: Stone chips discarded during the manufacture of stone tools.

Factory site: A specialised archaeological site where a specific set of technological activities has taken place – usually used to describe a place where stone tools were made.

Historic Period: Since the arrival of the white settlers - c. AD 1830 - in this part of the country.

Holocene: The most recent time period, which commenced c. 10 000 years ago.

Iron Age (also referred to as **Early Farming Communities**)**:** Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. As they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Later Iron Age	AD 1300 - AD 1830

Midden: The accumulated debris resulting from human occupation of a site.

Mitigation, means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

National Estate: The collective heritage assets of the Nation.

Pleistocene: Geological time period of 3 000 000 to 20 000 years ago.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 500 000 - 250 000 Before Present
Middle Stone Age	250 000 - 40 000 - 25 000 BP
Later Stone Age	40-25 000 - until c. AD 200

Tradition: As used in archaeology, it is a seriated sequence of artefact assemblages, particularly ceramics.

ACRONYMS and ABBREVIATIONS

AD	Anno Domini (the year 0)
ASAPA	Association of Southern African Professional Archaeologists

BC	Before the Birth of Christ (the year 0)
BCE	Before the Common Era (the year 0)
BP	Before Present (calculated from 1950 when radio-carbon dating was established)
CE	Common Era (the year 0)
CRM	Cultural Resources Management
CS-G	Chief Surveyor-General
EAP	Environmental Assessment Practitioner
EIA	Early Iron Age
ESA	Early Stone Age
HIA	Heritage Impact Assessment
I & AP's	Interested and Affected Parties
ICOMOS	International Council on Monuments and Sites
LIA	Late Iron Age
LSA	Later Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
WUL	Water Use Licence

COMPLIANCE WITH APPENDIX 6 OF THE 2014 EIA REGULATIONS (AS AMENDED)

Requirements of Appendix 6 – GN R982	**Addressed in the Specialist Report**
1. (1) A specialist report prepared in terms of these Regulations must contain-	
a) details of-	
i. the specialist who prepared the report; and	Front page
ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Page i Addendum Section 6
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
(cA) an indication of the quality and age of base data used for the specialist report;	Section 4
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 7
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 4
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 4
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 7; Figure 19
g) an identification of any areas to be avoided, including buffers;	Section 8
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figure 19 Section 7
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 7
k) any mitigation measures for inclusion in the EMPr;	Section 8 & 10
l) any conditions for inclusion in the environmental authorisation;	Section 10
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 9
n) a reasoned opinion-	
i. whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and	Section 10
ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 8, 10
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	-
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	-
q) any other information requested by the competent authority.	-
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	-

Phase 1 Cultural Heritage Impact Assessment:
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1. INTRODUCTION

1.1 Background

Diphororo Development (Pty) Ltd was appointed to conduct the environmental impact assessment (EIA) for the proposed Steamboat Project. The project name, Steamboat Project, is related to the farm name "Steamboat". Cuchron holds a valid Prospecting Right No LP/5/1/1/2/10321PR for Graphite over the farm's Steamboat 306MR and Inkom 305MR, covering an area of 1,453 hectares, situated along the Mogalakwena River in the Province of Limpopo.

Steamboat Graphite will establish a Beneficiation Plant in proximity to the mine, to beneficiate and process the graphite for a broader market.

A Mining Right Application has been submitted by Cuchron for the mine development, and acceptance was received on 12 November 2020.

Two Environmental Authorisation Applications has been submitted:

Cuchron has applied for Environmental Authorisation for the Mine Development and Associated Infrastructure;
Steamboat Graphite has applied for the Environmental Authorisation for the Beneficiation Plant and associated infrastructure.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. However, according to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *Diphororo Development (Pty) Ltd* to conduct a cultural heritage assessment to determine if the establishment of the mining operations would have an impact on any sites, features or objects of cultural heritage significance.

This report forms part of the Environmental Impact Assessment (EIA) as required by the EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and is intended for submission to the South African Heritage Resources Agency (SAHRA).

1.2 Terms and references

The aim of a full HIA investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective.

The result of this investigation is a heritage impact assessment report indicating the presence/ absence of heritage resources and how to manage them in the context of the proposed development.

Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, on condition of successful implementation of proposed mitigation measures.

1.2.1 *Scope of work*

The aim of this study is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where the establishment of the mine, associated Infrastructure and the beneficiation plant is to take place. This included:

- Conducting a desk-top investigation of the project area;
- A visit to the proposed project area.

The project area includes the following properties:

- A section of the farm Steamboat 306MR;
- A section of the farm Inkom 305MR.

The objectives were to:

- Identify possible archaeological, cultural and historic sites within the proposed development areas.
- Identify any potential 'fatal flaws' related to the proposed development.
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources.
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.
- Provide guideline measures to manage any impacts that might occur during the construction phase as well as the implementation phase.

1.2.2 *Assumptions and Limitations*

The investigation has been influenced by the following factors:

- It is assumed that the description of the proposed project, provided by the client, is accurate;
- It is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is sufficient and that it does not have to be repeated as part of the HIA;
- It is assumed that the information contained in existing databases, reports and publications is correct;
- The unpredictability of buried archaeological remains;
- The vegetation cover encountered during a site visit can have serious limitations on ground visibility, obscuring features (artefacts, structures) that might be an indication of human settlement;
- No subsurface investigation (i.e. excavations or sampling) were undertaken, since a permit from SAHRA is required for such activities.

2. LEGISLATIVE FRAMEWORK

2.1 Background

Heritage Impact Assessments are governed by national legislation and standards and International Best Practise. These include:

- South African Legislation
    - National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA);
    - Mineral and Petroleum Resources Development Act, 2002 (Act No. 22 of 2002) (MPRDA);
    - National Environmental Management Act 1998 (Act No. 107 of 1998) (NEMA); and
    - National Water Act, 1998 (Act No. 36 of 1998) (NWA).
- Standards and Regulations
    - South African Heritage Resources Agency (SAHRA) Minimum Standards;
    - Association of Southern African Professional Archaeologists (ASAPA) Constitution and Code of Ethics;
    - Anthropological Association of Southern Africa Constitution and Code of Ethics.
- International Best Practise and Guidelines
    - ICOMOS Standards (Guidance on Heritage Impact Assessments for Cultural World Heritage Properties); and
    - The UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage (1972).

2.2 Heritage Impact Assessment Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, Section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority.

The National Heritage Resources Act (Act No. 25 of 1999, Section 38) provides guidelines for Cultural Resources Management and prospective developments:

"38 (1) 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 50m in length;

(c) any development or other activity which will change the character of a site:

(i) exceeding 5 000 m^2 in extent; or

(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 SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m^2 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 the proposed development."

And:

"38 (3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

(a) The identification and mapping of all heritage resources in the area affected;

(b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;

(c) an assessment of the impact of the development on such heritage resources;

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

3. HERITAGE RESOURCES

3.1 The National Estate

The National Heritage Resources Act (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, including-
    - ancestral graves;
    - royal graves and graves of traditional leaders;
    - graves of victims of conflict;
    - graves of individuals designated by the Minister by notice in the Gazette;
    - historical graves and cemeteries; and
    - other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery in South Africa;
- movable objects, including-
    - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
    - objects to which oral traditions are attached or which are associated with living heritage;
    - ethnographic art and objects;
    - military objects;
    - objects of decorative or fine art;
    - objects of scientific or technological interest; and
    - 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(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

3.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that ''cultural significance'' means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature's uniqueness, condition of preservation and research potential.

According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of

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

A matrix (see Section 2 of Addendum) was developed whereby the above criteria were applied for the determination of the significance of each identified site. This allowed some form of control over the application of similar values for similar identified sites.

4. PROJECT DESCRIPTION

4.1 Site location

The projects are located on the farm's Steamboat 306MR and Inkom 305MR, which is situated approximately 36km south-west of Alldays and 54km north-west of Vivo in the Blouberg Local Municipality, Capricorn District of Limpopo Province (Fig. 1). For more information, see the Technical Summary on p. V above.

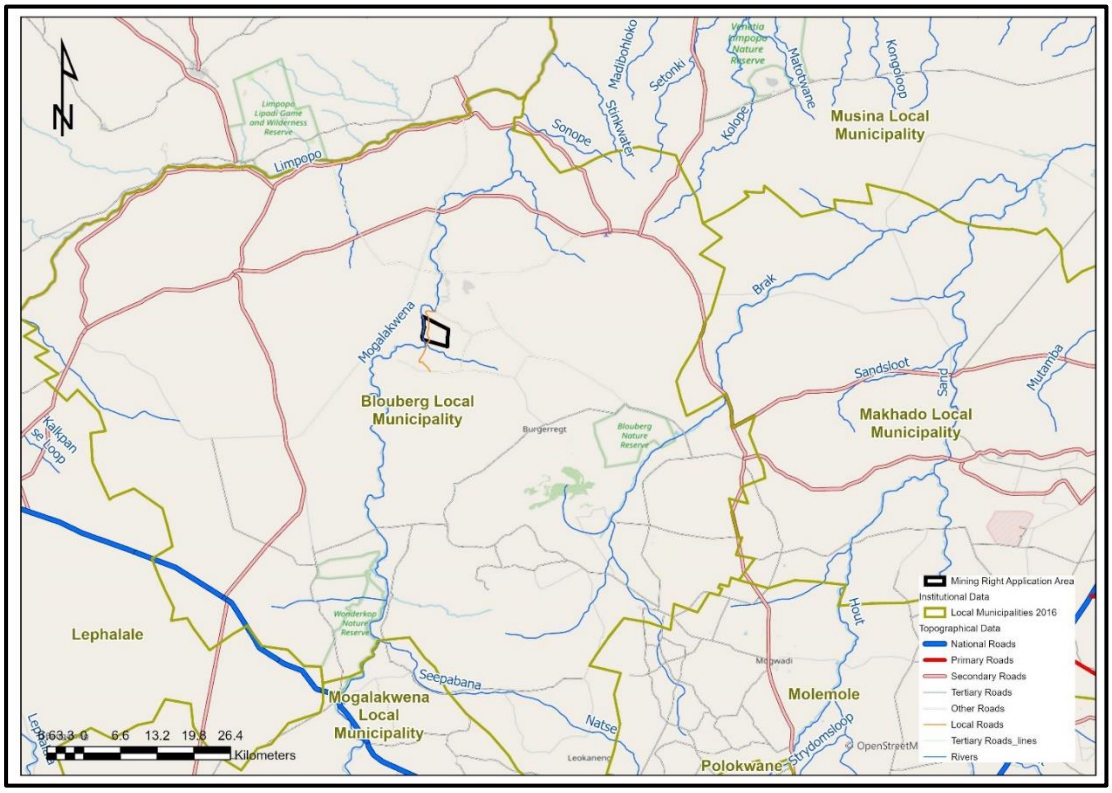


Figure 1. Location of the project area in regional context
(Map supplied by *Diphororo*)

4.2 Development proposal

The information presented below, was taken *ad verbum* from the document Diphororo Development, 2021. *Project Description and Alternatives*, supplied to the consultant on 21 February 2021:

- Steamboat Graphite will establish a Beneficiation Plant in proximity to the mine, to beneficiate and process the graphite for a broader market.
- A Mining Right Application has been submitted by Cuchron for the mine development, and acceptance was received on 12 November 2020.

Two Environmental Authorisation Applications has been submitted:

- Cuchron has applied for Environmental Authorisation for the Mine Development and Associated Infrastructure;
- Steamboat Graphite has applied for the Environmental Authorisation for the Beneficiation Plant and associated infrastructure.

Approval has been received from DMR to follow a joint and consolidated approach to the Environmental Impact Assessment Process, and produce combined reports for the two applications as envisaged in terms of Regulation 11(4) of the EIA regulations 2014 (as amended).

The total extent of the properties is 1453.5761ha. The projects will require the following footprints:

- Mining Open Pit and Associated infrastructure: 14ha (1% of properties)
- Beneficiation Plant and Associated infrastructure: 13ha (1% of properties)

The combined size of the two projects is 27ha in total.

Open Pit Mining: No site location alternatives have been considered as mining can only be undertaken in areas where economically mineable resources occur. This area was established through extensive prospecting and geological modelling.

Mining Workshops and Offices: Two alternative positions are being considered for the placement of the mine workshops and offices. These alternatives will be further evaluated during the EIA phase. Selection of the two alternatives were based on:

- Access to the Open pit;
- Underlying mineral resources;
- Access to services (road, water and electricity);
- Preliminary environmental factors such as topography, hydrology, sensitivity of the sites.

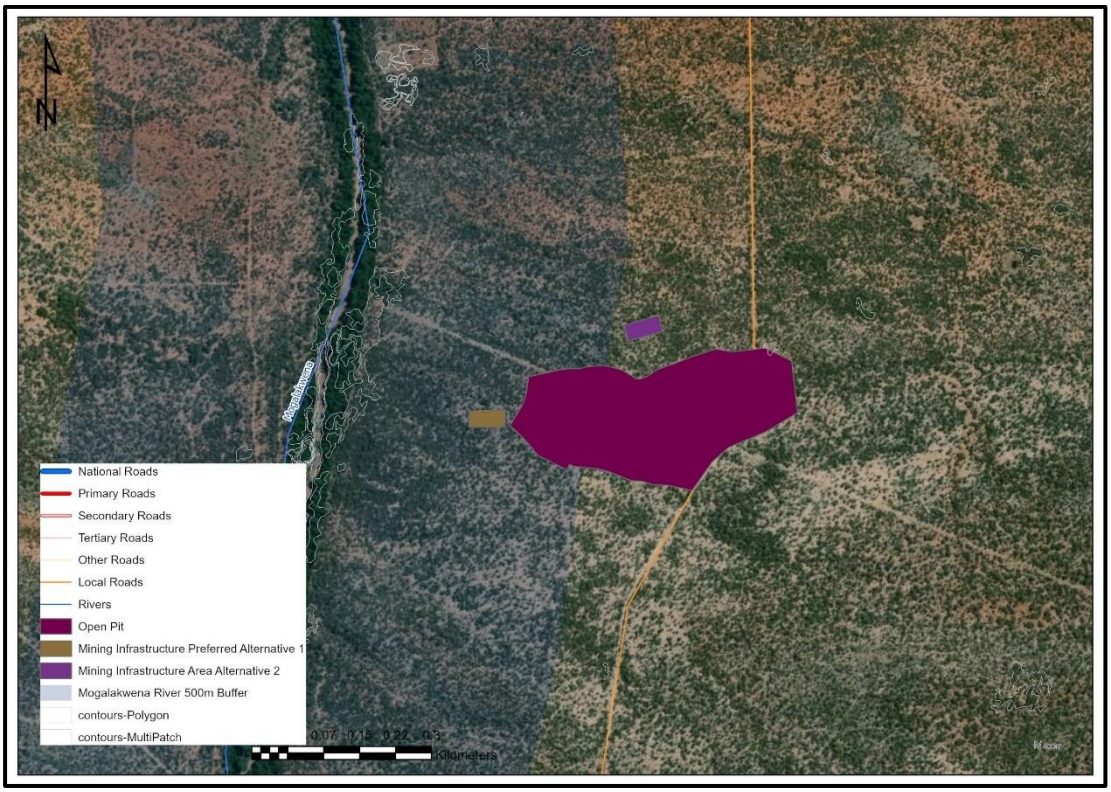


Figure 2: Mine Infrastructure site location alternatives
(Map supplied by *Diphororo*)

Mining Methodology

Mining method selection is one of the most critical activities of mining engineering. The factors that have a major impact on the mining method selection include:

Physical and mechanical characteristics of the deposit such as ground conditions of the mineral deposit, nature of overlying strata and parting between seams, type and strength of roof and floor rocks, deposit thickness, general shape, the orientation of deposit, plunge, depth of mineral below the surface, quality and strength of mineral, etc. The basic components that define the ground conditions are rock material shear strength, natural fractures and discontinuities, orientation, length, spacing and location of major geologic structures, in situ stress, hydrologic conditions, etc..

Technical factors such as mine recovery, the flexibility of methods, machinery, and mining rate; and Productivity factors such as annual productivity, equipment, efficiency, and environmental considerations.

The selected mining method for this project is an open-pit truck and shovel operation. This mining method has been employed extensively in numerous similar deposits globally. The selection of this mining method is based on the following four key criteria:

- Production targets - required graphite and waste tonnes to be excavated;
- The geometry of the graphite deposit;
- Anticipated in-pit mining conditions; and
- Flexibility of mining multiple benches within the defined open pit operation.

Underground mining is not considered feasible due to the shallow nature of the resource, which is only conducive to open-pit mining operations. These types of operations lead to optimal resource extraction, which results in lower operating costs.

Site and Infrastructure Location

Two site location alternatives were considered for both the Beneficiation Plant and its associated infrastructure, and the discard stockpile. These alternatives will be further evaluated during the EIA phase. Selection of the two alternatives was based on:

- Vicinity to primary product source (Open pit);
- Underlying mineral resources;
- Required capacity and footprint extent;
- Preliminary environmental factors such as topography, hydrology, the sensitivity of the sites.

Figure 3: Beneficiation Plant & Infrastructure and Discard Stockpile Site Location Alternatives
(Map supplied by *Diphororo*)

Product Transport

Two alternative routes for Product Transport will be considered, one route follows a northern direction from the site and then turns east towards Polokwane utilising existing roads, the second alternative follows a southern direction from the site and then turns east towards Polokwane.

These alternatives will be further evaluated during the EIA phase. Selection of the two alternatives was based on:

- The distance of the product transport route
- Quality of the existing roads
- Environmental and Social constraints

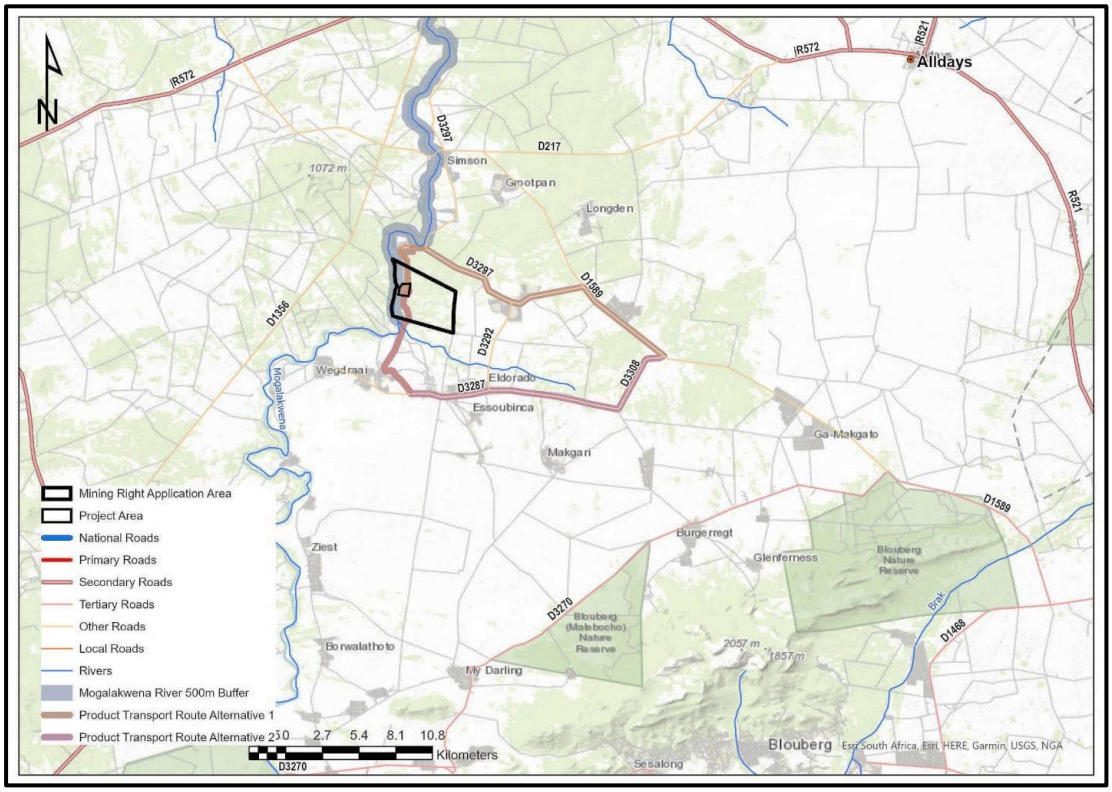


Figure 4: Product Transport Alternatives
(Map supplied by *Diphororo*)

Figure 5. The layout of the project area, showing the different alternatives

5. STUDY APPROACH AND METHODOLOGY

5.1 Extent of the Study

This survey and impact assessment cover all facets of cultural heritage located in the project area as presented in Section 4 above and illustrated in Figures 1 & 2.

5.2 Methodology

5.2.1 Pre-feasibility assessment

5.2.1.1 Survey of the literature
A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources were consulted – see list of references in Section 11.

- Information on events, sites and features in the larger region were obtained from these sources.

5.2.1.2 Survey of heritage impact assessments (HIAs)
A survey of HIAs done for projects in the region by various heritage consultants was conducted with the aim of determining the heritage potential of the area – see list of references in Section 11.

- Information on sites and features in the larger region were obtained from these sources.

5.2.1.3 Data bases
The *Heritage Atlas Database,* various SAHRA databases, the *Environmental Potential Atlas*, the *Chief Surveyor General* and the *National Archives of South Africa* were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed prospecting activities.

5.2.1.4 Other sources
Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information regarding built structures and features were obtained from these sources.

The results of the above investigation are summarised in Table 1 and Figure 6 below – see list of references in Section 11 – and can be summarised as follows:

- Stone Age tools, dating to the MSA and LSA occur as low-density scatters on some outcrops across the larger region;
- Sites containing Late Stone Age rock paintings occur to the south and north of the project area;
- Sites dating to the Early Iron Age occurs to the south of the project area;
- Sites dating to the dating the Late Iron Age occur to the south, east and west of the project area;
- Sites containing rock art relating to the Late Iron Age, early historic period occr to the south of the project area;
- Sites relating to early battlefields occur to the south-east of the project area;
- Historic structures, inclusive of settlements, buildings, monuments and bridges occur sporadically in the region;
- Formal and informal burial sites occur sporadically throughout the region.

Based on the above assessment, the probability of cultural heritage sites, features and objects occurring in the project area is deemed to be **possible**.

Table 1: Pre-Feasibility Assessment

Category	Period	Probability	Reference
Landscapes			
Natural/Cultural		None	Aerial photographs; Historic maps
Early hominin	Pliocene – Lower Pleistocene		
	Early hominin	None	-
Stone Age	Lower Pleistocene – Holocene		
	Early Stone Age	Low	Heritage Atlas Database
	Middle Stone Age	Low	Heritage Atlas Database
	Later Stone Age	Low	Heritage Atlas Database
	Rock Art	Low	Eastwood. & van Schalkwyk (2002)
Iron age	Holocene		
	Early Iron Age	Low	Van Schalkwyk (1998, 2004)
	Middle Iron Age	None	-
	Late Iron Age	Medium	Malan & Brink (1951); Van Schalkwyk (1994)
Colonial period	Holocene		
	Contact period/Early historic	Low	Joubert & Van Schalkwyk (1999); Roberts (1916); Sonntag (n.d); Van Schalkwyk & Moifatswane (1991); Van Schalkwyk & Smith (2004)
	Recent history	Medium	Van Schalkwyk (1995)
	Industrial heritage	Low	Heritage Atlas Database

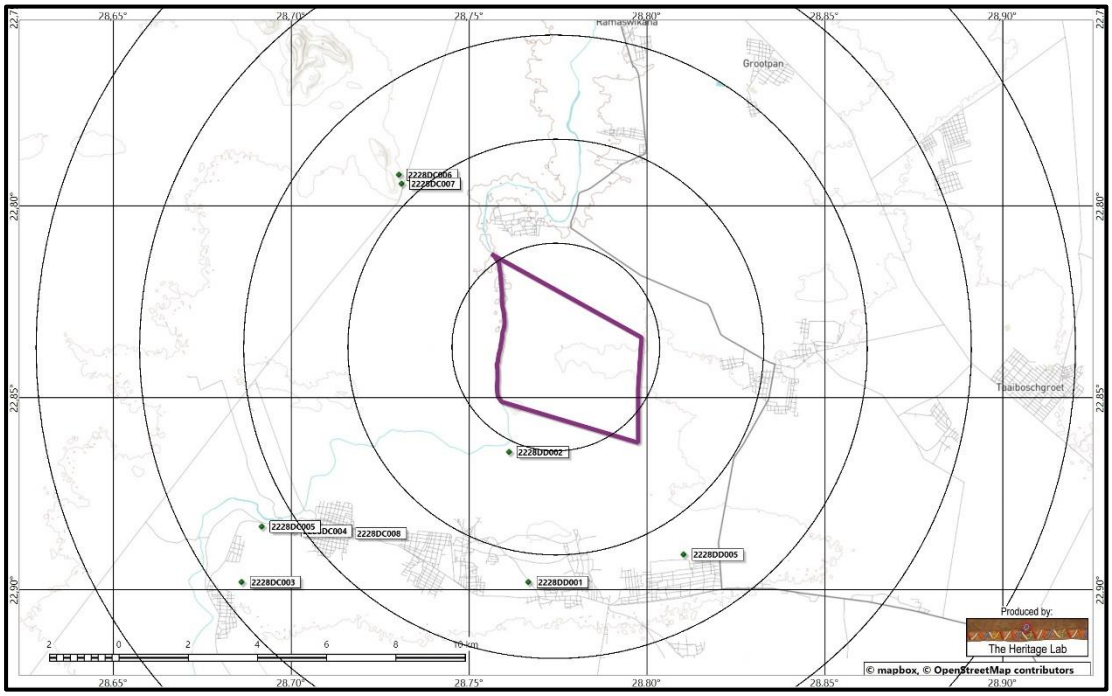


Figure 6. Location of known heritage sites and features in relation to the project area
(Circles spaced at a distance of 3km: heritage sites = coded green dots)

5.2.2 *Field survey*

The field survey was done according to generally accepted archaeological practices, and was aimed at locating all possible sites, objects and structures. The area that had to be investigated was identified by the *Diphororo Development (Pty) Ltd* by means of maps and .k*ml* files indicating the mining area. This was loaded onto a Samsung digital device and used in Google Earth during the field survey to access the area.

The project area was visited on 15 March 2021. During the site visit, archaeological visibility was limited due to the dense scrubland vegetation encountered (Fig. 8). Because of the thornveld bushes encountered this made walking structured transects very difficult (Fig. 7).

A number of local community members were interviewed during the site visit. Two of them, Mr Elias Rathuduwe and Mr Masilo Lawrence Leboho, accompanied the specialist during the survey. In addition, Mr Lucky Ngale of *Diphororo Consulting* also attended the field survey.

- Consultation with the local people confirmed that they did not know of the existence of any graves or built structures in the project area, indicating that nobody has ever lived on or close to the project area. According to them the area has always only been used for the grazing of cattle.

5.2.3 *Documentation*

All sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual localities are determined by means of the *Global Positioning System* (GPS) and plotted on a map. This information is added to the description in order to facilitate the identification of each locality. Map datum used: Hartebeeshoek 94 (WGS84).

The track log and identified sites were recorded by means of a Garmin Oregon 550 handheld GPS device. Photographic recording was done by means of a Canon EOS 550D digital camera. Geo-rectifying of the aerial photographs and historic maps was done by means of a professional software package: ExpertGPS.

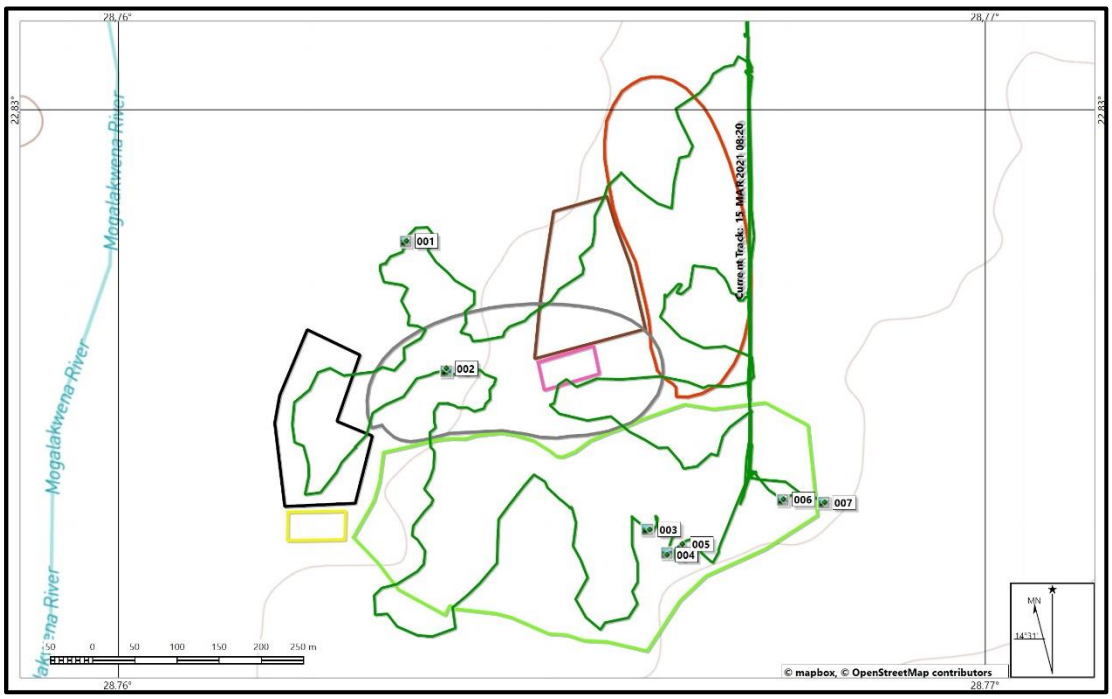


Figure 7. Map indicating the track log of the field survey
(Tracklog = dark green line)

6. DESCRIPTION OF THE AFFECTED ENVIRONMENT

6.1 Natural Environment

The geology of the region is made up of garnetiferous leucogneiss, abundant enclaves of metaquartzite, amphibolite, calc-silicate rocks, metapelite of the Malala Drift Group. The original vegetation is classified as Limpopo Sweet Bushveld, a savanna biome forming part of the Central Bushveld Bioregion (Muncina & Rutherford 2006). However, overgrazing by cattle and long-lasting periods of drought has turned this largely into a scrubland type of vegetation in the project region (Fig. 8).

The topography of the region is classified as slightly undulating plains, becoming somewhat broken in the vicinity of the Mokgalakwena River. The Mokgalakwena River, a non-perennial river, passes of few hundred metres to the west of the project area, flowing from south to north.

Scrubland vegetation

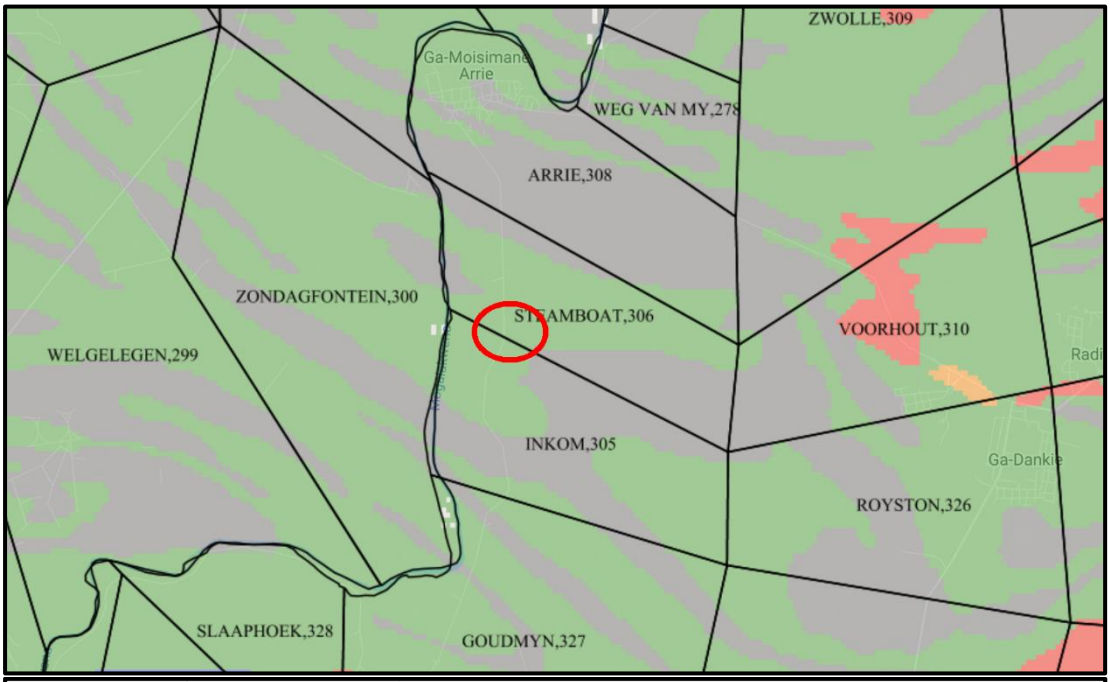
Scrubland vegetation

Overgrown mining trenches

Community members being interviewed

Figure 8. Views over the project area

The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that the project area (Fig. 9) has a moderate sensitivity of fossil remains to be found and therefore a desktop palaeontological assessment is required.



Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 9. The Palaeontological sensitivity of the project area

6.2 Cultural Landscape

The aim of this section is to present an overview of the history of the larger region in order to eventually determine the significance of heritage sites identified in the project area, within the context of their historic, aesthetic, scientific and social value, rarity and representivity.

- The cultural landscape qualities of the region essentially consist of a rural setup. In this the human occupation is made up of a pre-colonial element consisting of limited Stone Age occupation and an extensive Late Iron Age occupation. This was followed by a much later colonial farmer component. Population increase over time led to the establishment of a large number of rural villages.

Over many millennia, in fact dating as far back as Early Stone Age times (from *circa* 500 000 years ago), people have been living in the larger region of the Blouberg. These Early Stone Age people had little impact on the environment and their presence can only be deduced from the few stone tools occasionally found.

Human occupation of the area expanded, however, and during Middle Stone Age times (150 000 to 30 000 years ago), many more people were living in the area. One example of several very interesting Middle Stone Age sites that have been identified is the so-called Pietersburg industry with its large number of associated stone artefacts. These sites are mostly located below the mountain near current and old water courses.

During the Late Stone Age (30 000 to 2 000 ago), these hunter/gatherer people produced a rich heritage of rock paintings, giving expression to their complex religious system and world view. It might be significant that the rock art was not produced in Blouberg itself, but in large numbers in Makgabeng, a small highland area south of Blouberg. One of the reasons may be the shortage of suitable rock shelters in Blouberg itself. Late Stone Age people preferred staying in shelters, although a number of open sites have also been located on the plains below the mountain.

About 1 200 years ago, and possibly even earlier, the Blouberg area was also occupied by new groups of people, identified by archaeologists as Early Iron Age people. They did not replace the Stone Age people, but coexisted in an interdependent relationship with them. Though relatively few in number (only about six sites dating to this era have been identified as yet), these Early Iron Age communities had a vibrant way of life. They lived in settled villages and were mixed agriculturalists and pastoralists, but also hunter-gatherers. They produced pottery and worked iron (deduced from iron slag and other evidence), to produce tools, weapons and ornaments. The occurrence of cowrie shells at their former living sites indicates that they had trade contacts with the east coast.

Between 900 and 1 000 years ago, Bantu-speaking peoples moved out of the equatorial basin into central Africa. Perhaps as a consequence of this migration, two Late Iron Age groups moved into southern Africa between 700 and 800 years ago, replacing and absorbing the Early Iron Age people. The ceramic styles of these two groups link them to the Sotho-Tswana and Nguni languages, respectively. The Sotho-Tswana-speaking group, known to archaeologists as the Moloko people, also settled in the Blouberg area from 600 years ago onwards and sites with their distinctive pottery have been found in a number of places. Their way of life and economy were very similar to those of the Early Iron Age people.

An increase in population density, associated with the arrival of new settlers between 1650 to 1850, changed the demography and power base in the area. The Hananwa arrived at Blouberg as part of the last phase of Late Iron Age occupation. They originally separated from the Hurutshe, a Tswana-speaking people and, after trekking through Botswana and North-West Province, eventually settled at Blouberg in the Northern Province not later than in the first decades of the 19th century.

Oral history and archaeological evidence indicate that, by the time the Hananwa arrived at Blouberg, communities speaking Venda, Ndebele, Tswana and Sotho had already settled there. However, soon after settling at Blouberg, the Hananwa succeeded - under chief Matsiokwane (who died in 1879) - in attaining a position of dominance, either by displacement or by assimilation of the earlier communities.

This was a period of strife and uncertainty and brought about a change in the settlement pattern, as people clustered together for protection. Not only were sites bigger, but, while the plains surrounding Blouberg and Makgabeng average about 900m above sea level, sites from this period are generally found on the steep slopes of Blouberg at least at 1 100 to 1 150m above sea level. These sites - still crossed by climbers on their way to the krantzes - also differ from the earlier sites in that stone terraces were built to create their characteristic flat surfaces for settlement. In most cases the pottery differs markedly from site to site, indicating the diverse origins of the people who inhabited them. Only a few sites show correlations with pottery still being produced in the area. Quantities of glass trade beads, especially of a blue hexagonal type, have been found at these sites.

By plotting these sites on a map, one can deduce much about the political and social structure of the Hananwa society. The Hananwa capital was situated on the plateau high on Blouberg, right where climbers now look down at what is called by them, Malaboch's Kraal. When groups were subjected by the Hananwa, they became vassals, pledging obedience and support to the Hananwa chief. They were granted a place to stay, fields to plough and grazing areas for their cattle. These vassals were arranged, at a much lower level, around Blouberg. In this position, they not only symbolically acknowledged the superior position of the Hananwa chief, but also formed a first line of defense to protect the capital.

The Hananwa first had contact with white people from the 1840s onwards, when farmers, prospectors, missionaries and various administrators settled in the area. Cloth, glass beads, metal and guns were traded

for ivory, skins and cereals. The profit this held for the white settlers can be deduced from their willingness to take part in the conflicts that existed within and amongst the different black communities. The Voortrekkers who settled at the hamlet of Schoemansdal (1849-1867) east of Blouberg were very much involved in this. Contact with white people was extended by Hananwa men entering the field of migrant labour, first going to the diamond fields of Kimberley and later to the Witwatersrand gold fields.

During this time a dispute regarding the succession to the chieftainship split the Hananwa in two. Rakgotiane (half-brother to the chief) ruled over a small section of the Hananwa. After his death his son Ramatho claimed the chieftaincy for himself. Ramatho went to look for help from the Voortrekkers, who had recently settled at Schoemansdal. However, their combined forces were defeated and Ramatho was killed. His son, Maloko, eventually made peace with the main Hananwa faction and settled on the south-eastern edge of Blouberg. He was succeeded by his son, Kibi.

From 1868 onwards, the Berlin Mission Society had a number of mission stations in the Blouberg area, the principal one being on the farm Leipzig. They established the first schools and hospitals in the area. They also played an important role in political matters on a number of occasions, taking the side of the Hananwa against the government of the day. By documenting much of the life of the Hananwa in early colonial times, they contributed to our knowledge of the people and the place.

The position of dominance held by the Hananwa in the area led the government of the newly established Zuid-Afrikaanse Republiek to perceive them as a threat. Mainly because of this perception, but also for reasons such as the nonpayment of taxes and the Hananwa's refusal to move to a new 'location', the ZAR government declared war on the Hananwa and their chief, Kgalushi Leboho, in 1894. From the beginning of May to the end of July, the *burghers*, under the command of General Piet Joubert, laid siege to the Hananwa in an attempt to force them to surrender.

This strategy demanded the erection of a number of fortifications with the ultimate aim of surrounding the tribal capital and cutting it off from water and food supplies. Many of these structures still stand on Blouberg. In some of them, Martini-Henry cartridge cases and other objects of war can still be found. The tribe members who nowadays act as guides to climbers new to the area proudly recount this tale of the last resistance against the white man in South Africa, and of the secret cave in which the whole tribe could and did hide.

After a three-month siege of his capital by the ZAR forces, starvation and shortage of water forced Chief Leboho and his people to leave their mountain refuge and surrender to General Joubert and his troops. General Joubert took Chief Leboho and some of his men captive and sent them to jail in Pretoria. Six years later, in 1900, they were set free when the British occupied Pretoria. The chief returned to Blouberg, once again choosing to live in isolation on top of the mountain, where he reigned until his death in 1939.

Chief Kibi, the leader of the smaller section of the Hananwa, saw the war as an opportunity to expand his power over the main section of the Hananwa and therefore supported the ZAR forces. After the war, as a reward for their assistance, Kibi's people were given a temporary location (reserve) between Blouberg and Soutpan. It was only in the 1950s that this section of the Hananwa received their own tribal land, directly north of Blouberg.

The policy of the ZAR towards black people, as set out in Act No 4 of 1885, was one of non-interference. Only if a group of people was perceived to be a direct threat to the security of the state would action be taken against them, as was the case at Blouberg in 1894.

After the South African War and the British takeover of South Africa (1899 - 1902), a change in policy took place. At a local level, formal administration came to the Hananwa in 1903 when offices for the Native Commissioner and a police station were built on the farm Beauley, on the southern side of the mountain. (These ruins can be seen near where the alternative parking area to Frans Kraal has been set aside for climbers by the tribe in 1997). From then on the concept of 'state' as an institutional order of political management became a reality for the people of Blouberg. The Hananwa, and for that matter all the black

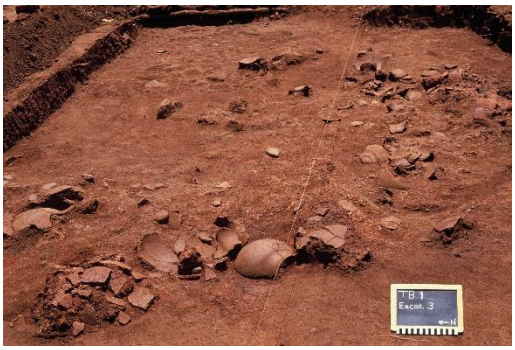
people of South Africa, now entered a period of administration that tried to create a life for them in homelands separate from the larger South African society.

The people of Blouberg very much followed a policy of passive resistance. A government plan to build a road up Blouberg to make access to the tribal capital easier, thereby breaking their isolation, fortunately didn't realize. In order to survive, people had to migrate to towns and farms to find work. Some of them, however, drew upon old customs to generate income by producing pottery, basketry and wooden utensils. Because of this, crafts that have been practiced for centuries are still alive at Blouberg. By the late 1980s and early 1990s there was widespread protest against the government as the system of apartheid began to disintegrate and the homelands were officially reincorporated into South Africa in 1994.

Below is presented a pictorial overview of the rich cultural heritage encountered in the larger region (Fig. 10). It should be noted that none of these sites are located in the project area.

MSA surface material

San rock art



Early Iron Age settlements

Late Iron Age settlements

Venda-type terraced sites

Contemporary homesteads

Mission stations

1894 ZAR fortification

Figure 10. Photo gallery
(Please note that none of the sites presented above occur within the boundaries of the project area)

6.3 Site specific review

Although landscapes with cultural significance are not explicitly described in the NHRA, they are protected under the broad definition of the National Estate (Section 3): Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate.

The examination of historical maps and aerial photographs help us to reconstruct how the cultural landscape has changed over time as is show how humans have used the land.

One of the earliest maps of the region was that done by Thomas Baines (1877) who trekked through the area during the early 1870s prospecting for gold while hunting. His map shows the lack of information that existed at that point in time, indicating only approximations of the various rivers, mountains and the spread of malaria in the region. A few years later in 1889, Fred and Carl Jeppe, who worked in the Surveyor General's Office in Pretoria, produced a map of the Transvaal. In the larger region of the project area, information was still limited, although a few farms and the location of mission stations are indicated (Fig. 11). Ten years later (1899) they have added a lot of cadastral information, indicating that the area had been surveyed and divided into farms. The presence of mining rights are also indicated for some farms, e.g. by Oceana Co. and T. Cons Co. (Fig. 12). The above mapping information by the Jeppe's is somewhat confusing as the Deeds of Transfer for both farms indicate that they were first surveyed only in 1905 (Fig. 13).

Later maps and aerial photographs indicate an area that was still empty of any development. The aerial photograph dating to 1956 (Fig. 14) shows a faint track crossing the area and a detail view of the project area (Fig. 15) shows it passing on the eastern boundary of the open pit area. No other features or excavations can be seen. On the later aerial photograph, dating to 1970 (Fig. 16), the road has become more formalised and the boundary fence between the two farms have been cleared of vegetation. It is only on the 2004 version of the aerial photograph that a number of parallel trenches can be seen in the open pit area (Fig. 17). The Google Earth image dating to 2021 (Fig. 18) shows an area that is still empty of any development.

One small area played, for a short while, a somewhat controversial role in the later history of the region. During 1894, when the ZAR waged a battle against the Hananwa of *Kgoši* Kgalushi, some of the burgers raided the area and found a large herd of cattle being kept at the hill known as Serala, on the southwestern corner of the farm Inkom. They proceeded to drive off all the cattle they could find. However, Genl. Piet Joubert, commanding officer of the ZAR troops was not happy about this as it turned out that most of the cattle belonged to the Birwa people that were settled in the larger region.

Joubert then had their cattle returned and only those that could be attributed to the Hananwa were confiscated.

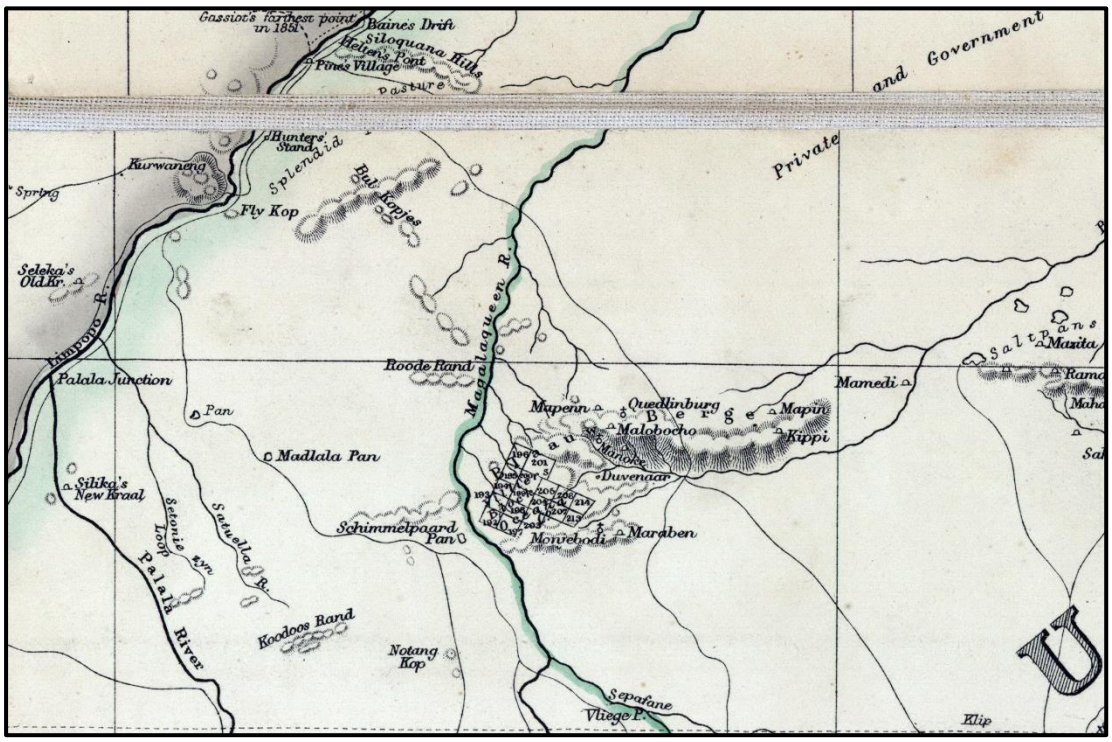


Figure 11. Section of Jeppe's , dating to 1889, showing the larger region of the project area (Map of the Transvaal or SA Republic and Surrounding Area)

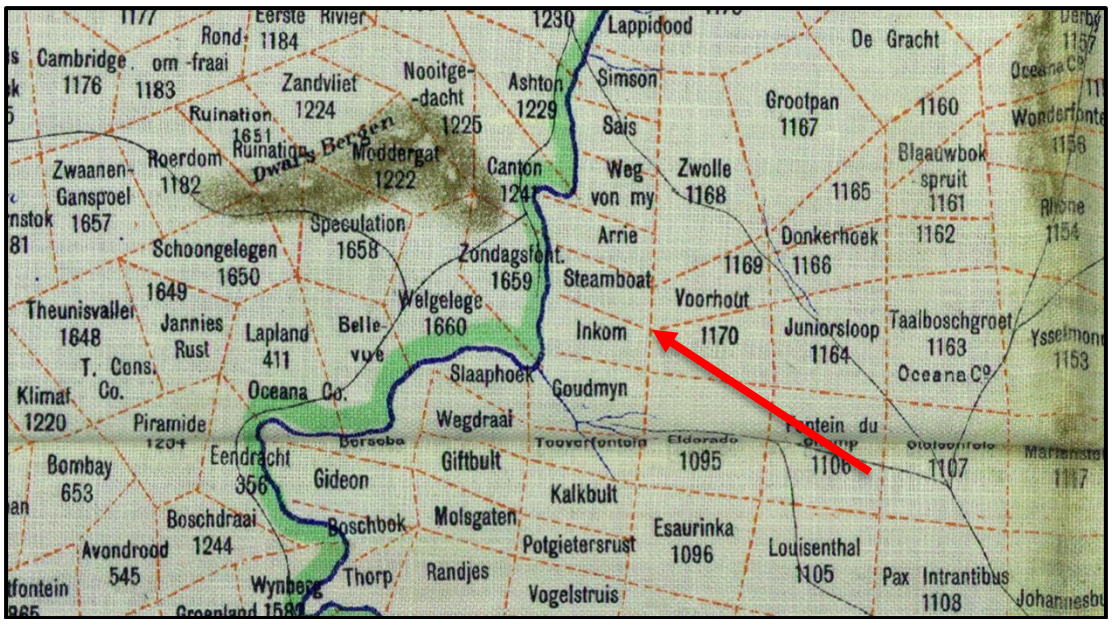


Figure 12. Section of Jeppe's , dating to 1899, showing the project area (Jeppe's Map of the Transvaal or S.A. Republic and Surrounding Territories)

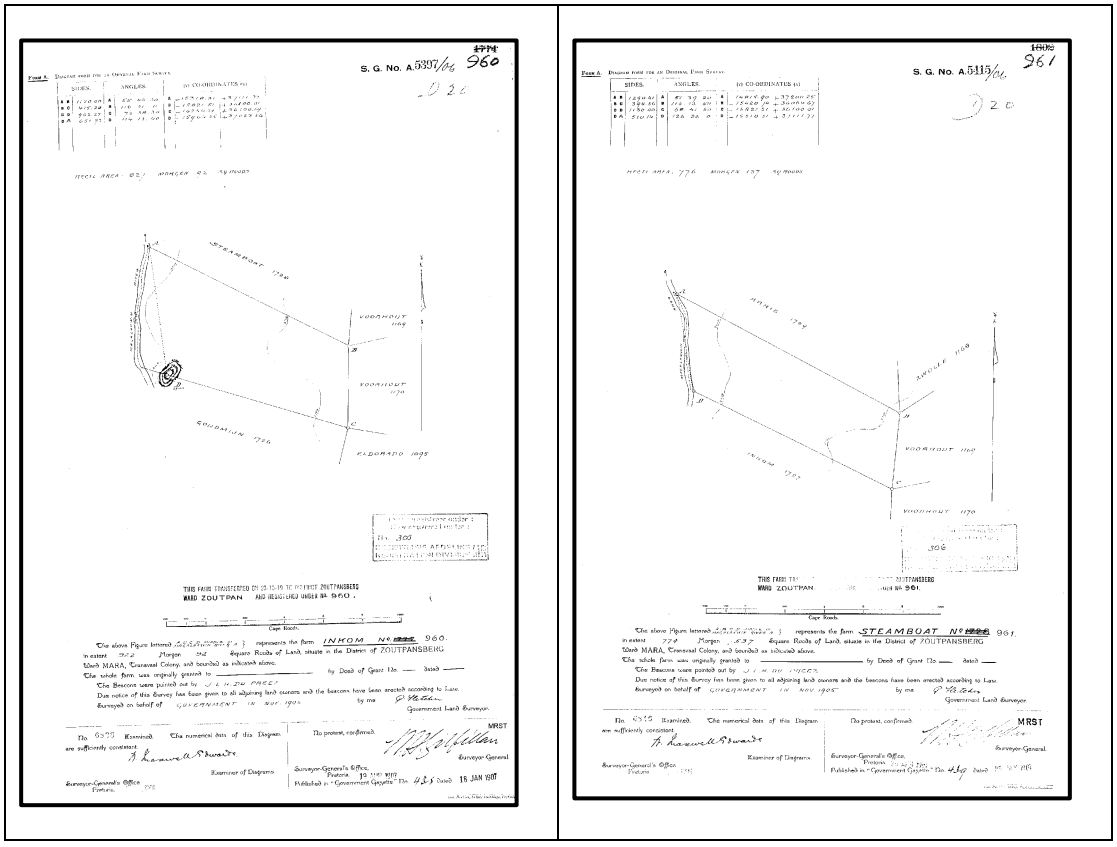


Figure 13. Copies of the Deeds of Transfer for the farms Inkom and Steamboat
(S-G Documents: No. A5397/06; No. A5415/06

Archival sources, see Section 11.3 below, indicate that the farm Inkom was allotted to a certain PJD Pieterse in 1921, and in the same year Steamboat was allotted to a certain PM Fourie. How long they had these farms is not indicated.

In 1926 a certain Mr Rautenbach enquired whether the farm Inkom is open to prospecting for **precious stones**. What the result of this was in unclear.

Figure 14. The larger project area as seen on the 1956 aerial photographs
(Chief Surveyor-General photograph: 366_003_00430; 366_004_00498)

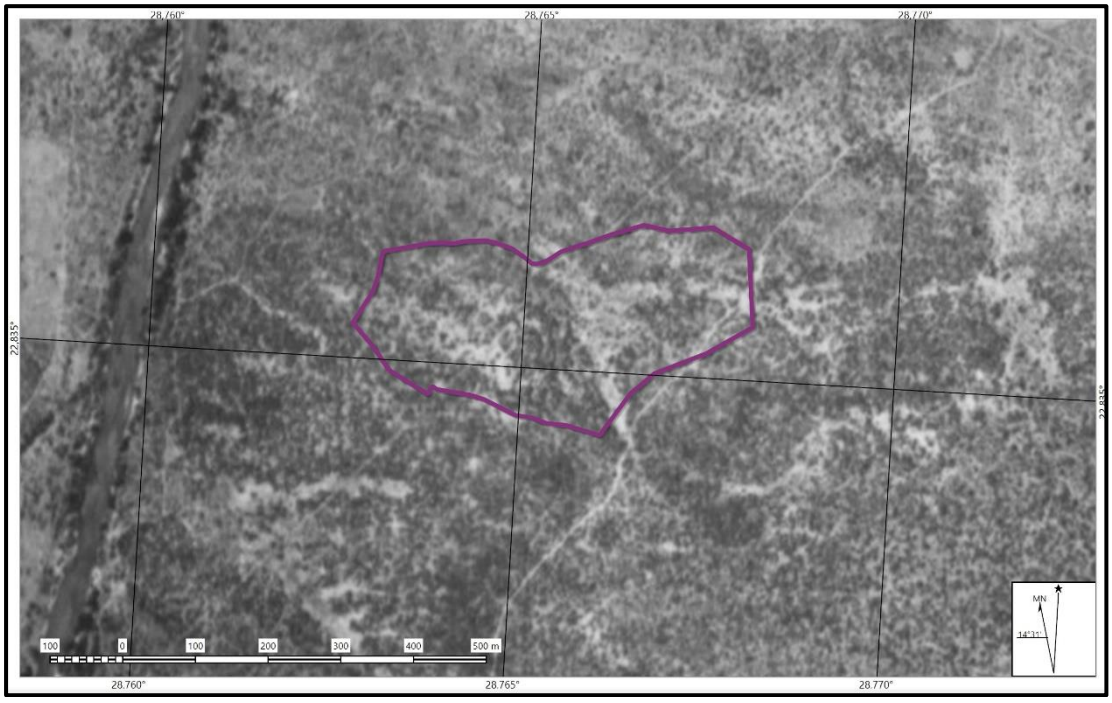


Figure 15. The project area (open pit) as seen on the 1956 aerial photograph
(Chief Surveyor-General photograph: 366_003_00430)

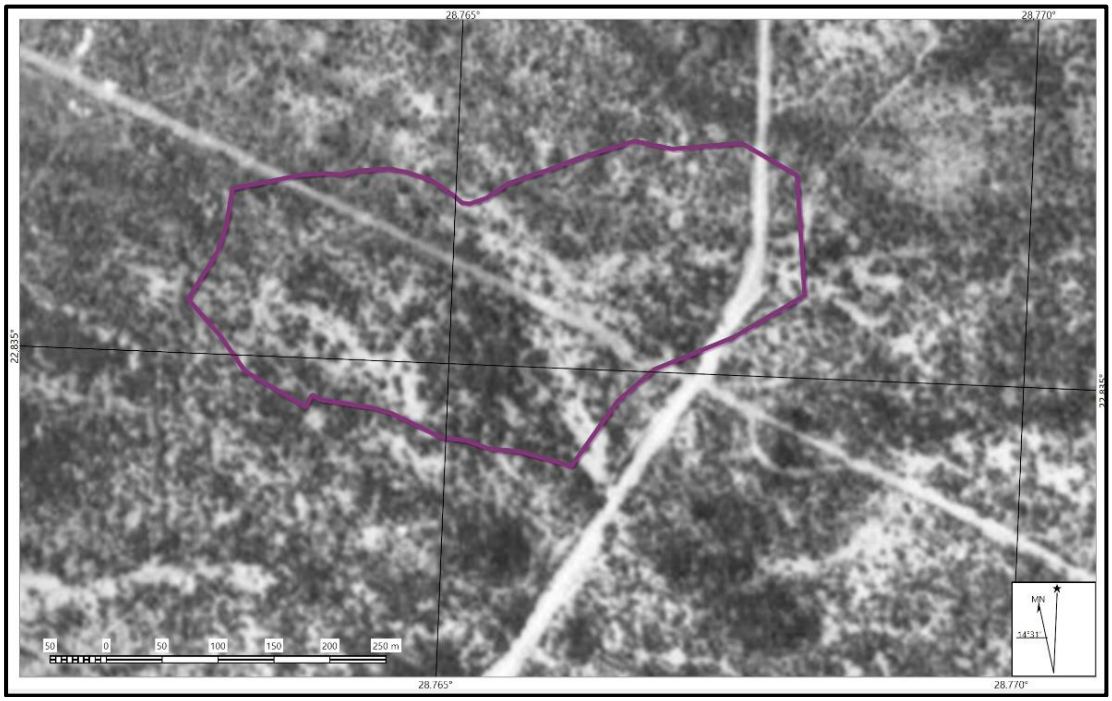


Figure 16. The project area (open pit) as seen on the 1970 aerial photograph
(Chief Surveyor-General photograph: 644_016_03574)

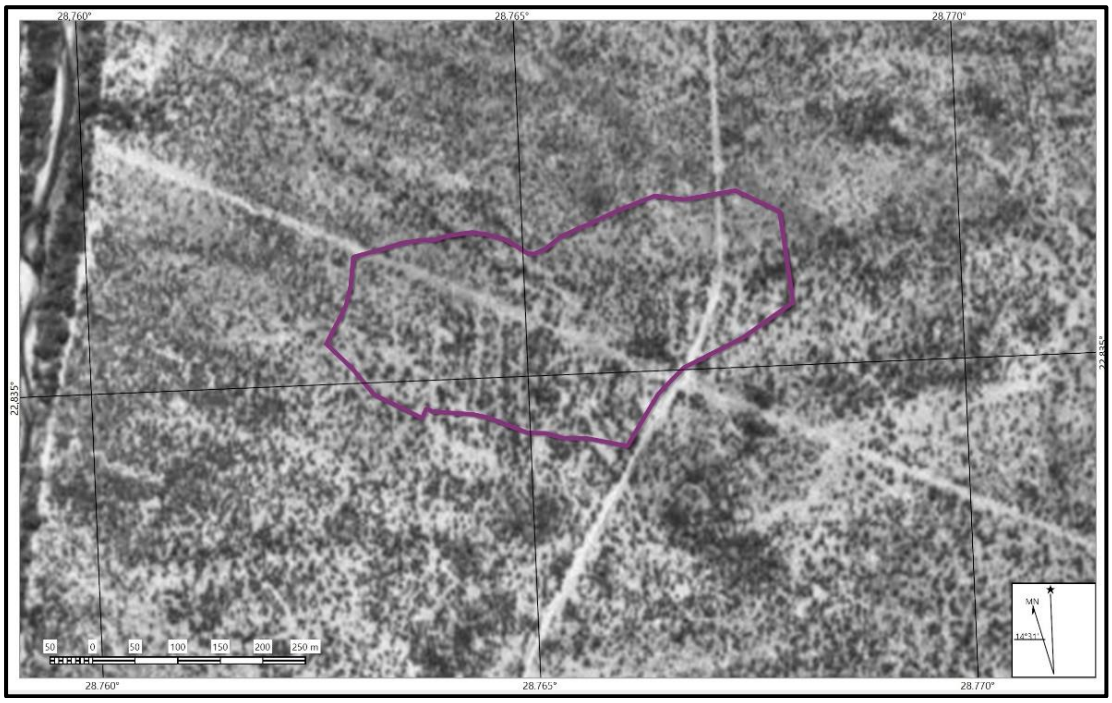


Figure 17. The project area (open pit) as seen on the 2004 aerial photograph
(Chief Surveyor-General photograph: 498_470_007_00223)

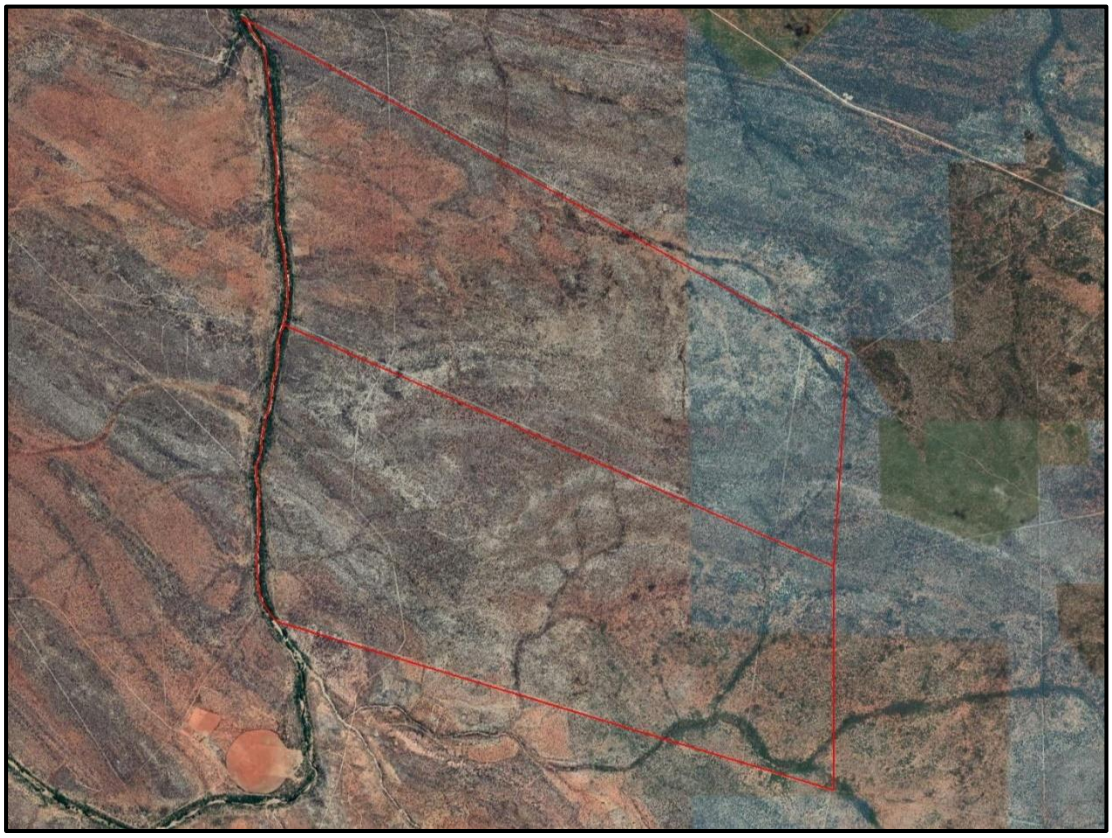


Figure 18. Aerial view of the project area in 2020
(Image: Google Earth)

7. SURVEY RESULTS

During the survey, the following sites, features and objects of cultural significance were identified in the project area (Fig. 19).

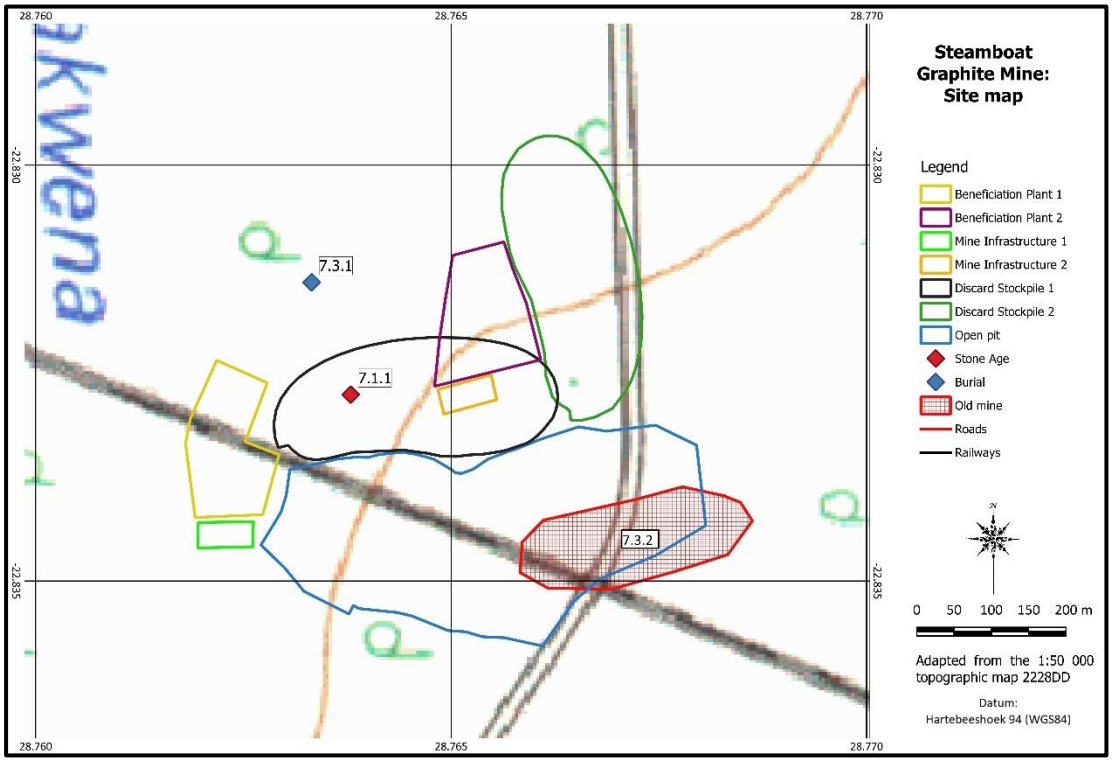


Figure 19. Location of heritage sites and features in the project area

7.1 Stone Age

NHRA Category	Archaeological resources – Section 35

7.1.1. Type: Chance find stone tools. **Farm**: Steamboat 306MR. **Coordinates**: S 22,83141; E 28,76332	
Description: Stone Age artefacts, mostly dating to the Middle Stone Age occur in low numbers scattered in parts of the study area. The density of artefacts is less than 1/20m^2 overall. The tools are mostly made from quartzite. The tools are very poorly made and also shows a lot of weathering.	
Significance of site/feature	Generally protected 4C: Low significance - Requires no further recording before destruction
Reasoned opinion:	
References: -	

Figure 20. Chance find stone tools

7.2 Iron Age

- No sites, features or objects of cultural significance dating to the Iron Age were identified in the project area.

7.3 Historic period

NHRA Category	**Graves, Cemeteries and Burial Grounds - Section 36**

7.3.1. Type: Burial site. **Farm**: Steamboat 306MR. **Coordinates**: S 22,83141; E 28,76332	
Description: What seems to be a single grave, marked by a packed circle of stone and a small, different type of stone as headstone. It seems to be very old and no other signs of habitation could be detected.	
Significance of site/feature	Generally protected 4A: High/medium significance - Should be mitigated before destruction.
Reasoned opinion: Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedures have been followed.	
References: -	

Figure 21. Views of the burial site

NHRA Category	**Structures older than 60 years - Section 34**

7.3.2. Type: Old mining area. **Farm**: Inkom 305MR & Steamboat 306MR. **Coordinates**: S 22,83445; E 28,76722	
Description: A series of trenched and deep pits confined to a section where the open pit is planned. The pits seems to have been dug by hand and in some sections there seems to have been some hand-sorting of the material. It is as yet impossible to attribute a definite date to this excavations. Some of the trenches are also much overgrown with trees and shrubs, indicating that they are quite old. According to local community members, they have been playing here since they were very young, once having even managed to catch an impala by chasing it into on of the pits. They are now all older than sixty years old, implying that the mining took place prior to that, making possibly older than 60 years. However, it is also stated that there were some exploration being done here in the late 1980s by Mintek and the South African Development Trust (Badenhorst (2019:126), although the extent of this exploration is not indicated.	
Significance of site/feature	Generally protected 4B: Medium significance - Should be recorded before destruction

Reasoned opinion: It represents the remains of a technology that became redundant due to technological development. Such sites representing industrial heritage are usually few and far between and therefore the destruction of a single such site would have a proportionate high impact on the occurrences of similar features in the larger landscape.
References: Badenhorst (2019); Oosterhuis (1998)

	
Deep mining hole	Old trench

Figure 22. Different views of the old mining feature

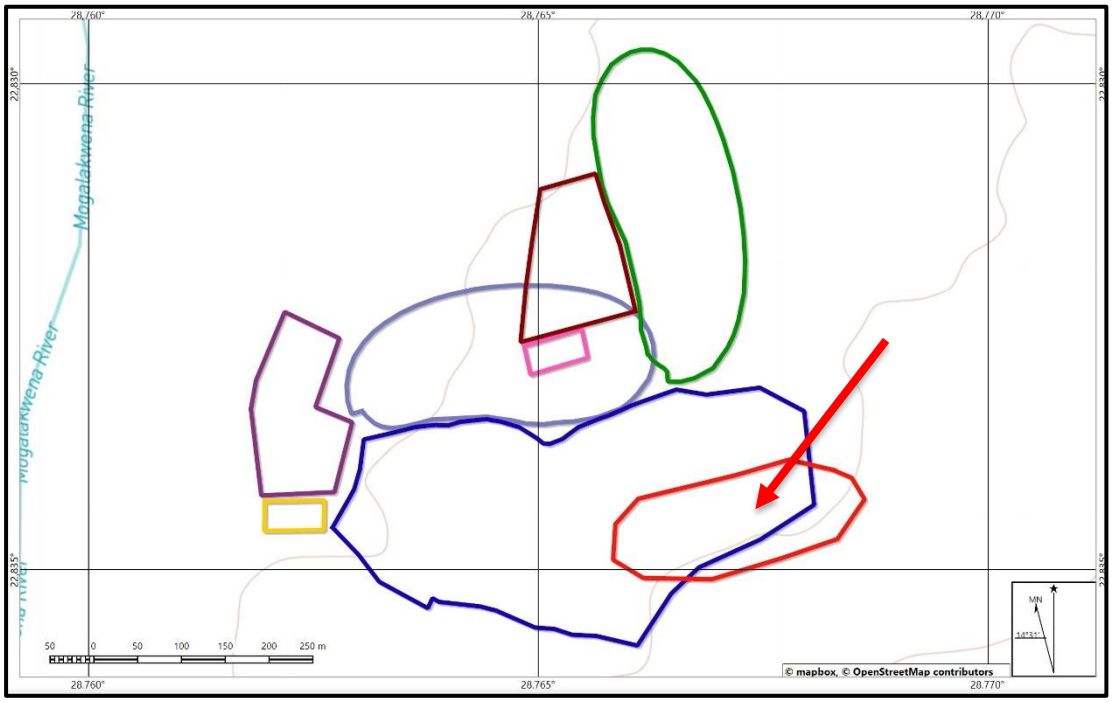


Figure 23. Approximate area of the old mine workings – arrowed in red

8. IMPACT ASSESSMENT RATINGS AND MITIGATION MEASURES

8.1 Impact assessment

Heritage impacts are categorised as:

- Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries;
- Indirect impacts, e.g. restriction of access or visual intrusion concerning the broader environment;
- Cumulative impacts that are combinations of the above.

Table 2: Impact assessment

7.1.1 Type: Change find stone tools		
Impact assessment: These features are rated to have low significance due to their low numbers as well as the fact that the area has already extensively been disturbed due to being surface material.		
	Without mitigation	With mitigation
Extent	Local area	Site
Duration	Permanent	Permanent
Intensity	Low	Minor
Probability	Probable	Low
Significance	Low (10)	Low (4)
Status (positive or negative)	Negative	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	Yes	
Mitigation: Avoidance of site		
Cumulative impact: Limited loss of similar features in the larger landscape.		

7.3.1 Type: Burial site		
Impact assessment: This site is located outside the proposed development area and therefore it is unlikely hat it would be impacted on.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Intensity	Minor (2)	Minor (2)
Probability	Very improbable (1)	Very improbable (1)
Significance	Low (8)	Low (8)
Status (positive or negative)	Neutral	Neutral
Reversibility	n/a	n/a
Irreplaceable loss of resources?	No	No
Can impacts be mitigated	n/a	
Mitigation: None required		
Cumulative impact: None		

7.3.2. Type: Mining features		
Impact assessment		
This site is located inside the proposed development area and would definitely be impacted on.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Intensity	High (8)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	Medium (56)	Low (16)
Status (positive or negative)	Negative	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	Yes	
Cumulative impact: Loss of a limited number of similar features in the larger landscape.		

8.2 Mitigation measures

Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

- For the current study, the following mitigation measures are proposed:

7.1.1. Type: Chance finds Stone Age tools.
Mitigation
(5) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report. • Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage/remains are destroyed.
Requirements
None

7.3.1. Type: Burial site
Mitigation
(1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources. The site should be retained *in situ* and should be fenced off, with a buffer zone of at least 20m. • Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation to ensure that no accidental damaged is caused to the features or that undetected heritage/remains are destroyed.
Requirements
In the event of an impact occurring on the identified site or feature, a permit for mitigation and/or destruction must be obtained from SAHRA/PHRA prior to any work being carried out.

7.3.1. Type: Old mining
Mitigation
(2) Archaeological investigation: This option can be implemented with additional design and construction inputs. This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated. Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist. • This option should be implemented when it is impossible to avoid impacting on an identified site or feature.
Requirements
In the event of an impact occurring on the identified site or feature, a permit for mitigation and/or destruction must be obtained from SAHRA/PHRA prior to any work being carried out.

9. MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

Sources of risk were considered with regards to development activities defined in Section 2(viii) of the NHRA that may be triggered and are summarised in Table 3A and 3B below. These issues formed the basis of the impact assessment described. The potential risks are discussed according to the various phases of the project below.

9.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities.

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

9.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

Table 3A: Construction Phase: Environmental Management Programme for the project

Action required	Protection of heritage sites, features and objects
Potential Impact	The identified risk is damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.

Risk if impact is not mitigated	Loss or damage to sites, features or objects of cultural heritage significance		
Activity / issue	**Mitigation: Action/control**	**Responsibility**	**Timeframe**
1. Removal of Vegetation 2. Construction of required infrastructure, e.g. access roads, water pipelines	See discussion in Section 9.1 above	Environmental Control Officer	During construction only
Monitoring	See discussion in Section 9.2 above		

Table 3B: Operation Phase: Environmental Management Programme for the project

Action required	Protection of heritage sites, features and objects		
Potential Impact	It is unlikely that the negative impacts identified for pre-mitigation will occur if the recommendations are followed.		
Risk if impact is not mitigated	Loss or damage to sites, features or objects of cultural heritage significance		
Activity / issue	**Mitigation: Action/control**	**Responsibility**	**Timeframe**
1. Removal of Vegetation 2. Construction of required infrastructure, e.g. access roads, water pipelines	See discussion in Section 9.1 above	Environmental Control Officer	During construction only
Monitoring	See discussion in Section 9.2 above		

9.3 Legal requirements

The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that sites, features or objects of heritage significance occur in the project area.

- The old graphite mine workings in the project area is probably older than 60 years, is rare and therefore formally protected by the NHRA of 1999. Impact on or destruction of this feature for the purposes of the new mining operation would require a permit which must be obtained from SAHRA/PHRA prior to any work being carried out. This permit will only be issue after the proposed mitigation measures have been successfully implemented.
- If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

10. CONCLUSIONS AND RECOMMENDATIONS

Diphororo Development (Pty) Ltd was appointed to conduct the environmental impact assessment (EIA) for the proposed Steamboat Project. The project name, Steamboat Project, is related to the farm name "Steamboat". Cuchron holds a valid Prospecting Right No LP/5/1/1/2/10321PR for Graphite over the farm's Steamboat 306MR and Inkom 305MR, covering an area of 1,453 hectares, situated along the Mogalakwena River in the Province of Limpopo.

This report describes the methodology used, the limitations encountered, the heritage features that were identified and the recommendations and mitigation measures proposed relevant to this. The HIA consisted of a desktop study (archival sources, database survey, maps and aerial imagery) and a physical

survey that included the interviewing of relevant people. It should be noted that the implementation of the mitigation measures is subject to SAHRA/PHRA's approval.

The cultural landscape qualities of the region essentially consist of a rural setup. In this the human occupation is made up of a pre-colonial element consisting of limited Stone Age occupation and an extensive Late Iron Age occupation. This was followed by a much later colonial farmer component. Population increase over time led to the establishment of a large number of rural villages.

Limitations encountered

During the site visit, the high and dense vegetation that covered the project area limited ground visibility very much, even to the point of making the determination of buffer zones around identified sites impossible.

Identified sites

During the survey the following sites, features or objects of cultural significance were identified:

- 7.1.1: Stone Age artefacts, mostly dating to the Middle Stone Age occur in low numbers scattered in parts of the study area. The density of artefacts is less than 1/20m^2 overall. The tools are mostly made from quartzite. The tools are very poorly made and also shows a lot of weathering.

- 7.3.1: What seems to be a single grave, marked by a packed circle of stone and a small, different type of stone as headstone. It seems to be very old and no other signs of habitation could be detected.

- 7.3.2: A series of trenched and deep pits confined to a section where the open pit is planned. It is as yet impossible to attribute a definite date to this excavations. Some of the trenches are also much overgrown with trees and shrubs, indicating that they are quite old. According to local community members, they have been playing here since they were very young, implying that the mining took place prior to that, making possibly older than 60 years. However, it is also stated that there were some exploration being done here in the late 1980s by Mintek and the South African Development Trust (Badenhorst 2019:126), although the extent of this exploration is not indicated.

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed mining activities is based on the present understanding of the project:

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.1.1	Chance find stone tools	Section 35	Generally protected 4B: Medium significance	Low (10) Low (4)
Mitigation: (5) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report. This is also applicable where the identified feature is located in such a position that the proposed development is unlikely to impact on the site.				

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.1	Burial site	Section 36	Generally protected 4A: High significance	Low (8) Low (8)
Mitigation: (1) Avoidance/Preserve: (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and the site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall) of 20m.				

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation

7.3.2	Old mining features	Section 34	Generally protected 4B: Medium significance	Medium (56) Low (16)
Mitigation: (2) Archaeological investigation: Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist. This option should be implemented when it is impossible to avoid impacting on an identified site or feature.				

Legal requirements

- The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that sites, features or objects of heritage significance occur in the project area, therefore permits are required from SAHRA or the PHRA.
- If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view, it is recommended that the proposed activities be allowed to continue on acceptance of the proposed mitigation measures and the conditions proposed below.

Conditions for inclusion in the environmental authorisation:

- The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that the project area has a moderate sensitivity of fossil remains to be found and therefore a desktop palaeontological assessment is required.
- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. The appropriate steps to take are indicated in Section 9 of the report, as well as in the **Management Plan: Burial Grounds and Graves, with reference to general heritage sites**, in the Addendum, Section 12.4.

11. REFERENCES

11.1 Data bases

Chief Surveyor General
Environmental Potential Atlas, Department of Environmental Affairs and Tourism.
Heritage Atlas Database, Pretoria
National Archives of South Africa
SAHRA Archaeology and Palaeontology Report Mapping Project (2009)
SAHRIS Database

11.2 Literature

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11.3 Archival sources, maps and aerial photographs

1: 50 000 Topographic maps
Google Earth
Aerial Photographs: Chief Surveyor-General
http://artefacts.co.za
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Depot SAB, **Source** URU, **Volume no** 529, **Reference** 2737, **Part** 1, **Date** 1921
Depot SAB, **Source** MNW, **Volume no** 837, **Reference** MM1279/26, **Part** 1, **Date** 1926

12. ADDENDUM

1. Indemnity and terms of use of this report

The findings, results, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and the author reserve the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although all possible care is taken to identify all sites of cultural importance during the investigation of project areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. The author of this report will not be held liable for such oversights or for costs incurred as a result of such oversights.

Although the author exercises due care and diligence in rendering services and preparing documents, he accepts no liability and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of the information contained in this document.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

2. Assessing the significance of heritage resources and potential impacts

A system for site grading was established by the NHRA and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

2.1 *Significance of the identified heritage resources*

According to the NHRA, Section 2(vi) the **significance** of a heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. 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.

Matrix used for assessing the significance of each identified site/feature

1. SITE EVALUATION			
1.1 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 organisation of importance in history			
Does it have significance relating to the history of slavery			
1.2 Aesthetic value			
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group			
1.3 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			
1.4 Social value			
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons			
1.5 Rarity			
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage			
1.6 Representivity			
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects			
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class			
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.			
2. Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific community			
3. Field Register Rating			
1.	National/Grade 1: High significance - No alteration whatsoever without permit from SAHRA		
2.	Provincial/Grade 2: High significance - No alteration whatsoever without permit from provincial heritage authority.		
3.	Local/Grade 3A: High significance - Mitigation as part of development process not advised.		

4.	Local/Grade 3B: High significance - Could be mitigated and (part) retained as heritage register site	
5.	Generally protected 4A: High/medium significance - Should be mitigated before destruction	
6.	Generally protected 4B: Medium significance - Should be recorded before destruction	
7.	Generally protected 4C: Low significance - Requires no further recording before destruction	

2.2 *Significance of the anticipated impact on heritage resources*

All impacts identified during the HIA stage of the study will be classified in terms of their significance. Issues would be assessed in terms of the following criteria:

Nature of the impact
A description of what causes the effect, what will be affected and how it will be affected.

Extent
The physical **extent**, wherein it is indicated whether:
- 1 - The impact will be limited to the site;
- 2 - The impact will be limited to the local area;
- 3 - The impact will be limited to the region;
- 4 - The impact will be national; or
- 5 - The impact will be international.

Duration
Here it should be indicated whether the lifespan of the impact will be:
- 1 - Of a very short duration (0–1 years);
- 2 - Of a short duration (2-5 years);
- 3 - Medium-term (5–15 years);
- 4 - Long term (where the impact will persist possibly beyond the operational life of the activity); or
- 5 - Permanent (where the impact will persist indefinitely).

Magnitude (Intensity)
The magnitude of impact, quantified on a scale from 0-10, where a score is assigned:
- 0 - Small and will have no effect;
- 2 - Minor and will not result in an impact;
- 4 - Low and will cause a slight impact;
- 6 - Moderate and will result in processes continuing but in a modified way;
- 8 - High, (processes are altered to the extent that they temporarily cease); or
- 10 - Very high and results in complete destruction of patterns and permanent cessation of processes.

Probability
This describes the likelihood of the impact actually occurring and is estimated on a scale where:
- 1 - Very improbable (probably will not happen);
- 2 - Improbable (some possibility, but low likelihood);
- 3 - Probable (distinct possibility);
- 4 - Highly probable (most likely); or
- 5 - Definite (impact will occur regardless of any prevention measures).

Significance
The significance is determined through a synthesis of the characteristics described above (refer to the formula below) and can be assessed as low, medium or high:

S = (E+D+M) x P; where
S = Significance weighting

E = Extent
D = Duration
M = Magnitude
P = Probability

Significance of impact		
Points	Significant Weighting	Discussion
< 30 points	Low	Where this impact would not have a direct influence on the decision to develop in the area.
31-60 points	Medium	Where the impact could influence the decision to develop in the area unless it is effectively mitigated.
> 60 points	High	Where the impact must have an influence on the decision process to develop in the area.

Confidence
This should relate to the level of confidence that the specialist has in establishing the nature and degree of impacts. It relates to the level and reliability of information, the nature and degree of consultation with I&AP's and the dynamic of the broader socio-political context.

- High, where the information is comprehensive and accurate, where there has been a high degree of consultation and the socio-political context is relatively stable.
- Medium, where the information is sufficient but is based mainly on secondary sources, where there has been a limited targeted consultation and socio-political context is fluid.
- Low, where the information is poor, a high degree of contestation is evident and there is a state of socio-political flux.

Status
- The status, which is described as either positive, negative or neutral.

Reversibility
- The degree to which the impact can be reversed.

Mitigation
- The degree to which the impact can be mitigated.

Nature:		
	Without mitigation	With mitigation
Construction Phase		
Probability		
Duration		
Extent		
Magnitude		
Significance		
Status (positive or negative)		
Operation Phase		
Probability		
Duration		
Extent		
Magnitude		
Significance		
Status (positive or negative)		
Reversibility		
Irreplaceable loss of resources?		
Can impacts be mitigated		

3. Mitigation measures

- *Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.*

Impacts can be managed through one or a combination of the following mitigation measures:

- Avoidance
- Investigation (archaeological)
- Rehabilitation
- Interpretation
- Memorialisation
- Enhancement (positive impacts)

For the current study, the following mitigation measures are proposed, to be implemented only if any of the identified sites or features are to be impacted on by the proposed development activities:

- (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources. The site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall). Depending on the type of site, the buffer zone can vary from
    - 10 metres for a single grave, or a built structure, to
    - 100 metres where the boundaries are less obvious, e.g. a Late Iron Age site.

- (2) Archaeological investigation/Relocation of graves: This option can be implemented with additional design and construction inputs. This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated. Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist.
    - This option should be implemented when it is impossible to avoid impacting on an identified site or feature.
    - This also applies for graves older than 60 years that are to be relocated. For graves younger than 60 years a permit from SAHRA is not required. However, all other legal requirements must be adhered to.
        - Impacts can be beneficial – e.g. mitigation contribute to knowledge

- (3) Rehabilitation: When features, e.g. buildings or other structures are to be re-used. Rehabilitation is considered in heritage management terms as an intervention typically involving the adding of a new heritage layer to enable a new sustainable use.
    - The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.
    - Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.
        - Conservation measures would be to record the buildings/structures as they are (at a particular point in time). The records and recordings would then become the 'artefacts' to be preserved and managed as heritage features or (movable) objects.
        - This approach automatically also leads to the enhancement of the sites or features that are re-used.

- (4) Mitigation is also possible with additional design and construction inputs. Although linked to the previous measure (rehabilitation) a secondary though 'indirect' conservation measure would be to use the existing architectural 'vocabulary' of the structure as guideline for any new designs.
    - The following principle should be considered: **heritage informs design**.
        - This approach automatically also leads to the enhancement of the sites or features that are re-used.

- (5) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report.
    - Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage/remains are destroyed.

4. Management Plan: Burial Grounds and Graves, with reference to general heritage sites

1. Background

Burial grounds and graves are viewed as having high emotional and sentimental value and accordingly always carry a high cultural heritage significance rating. Best practice principles dictate that they should preferably be preserved *in situ*. It is only when it is unavoidable and the site cannot be retained, that the graves should be exhumed and relocated after all due processes had been successfully implemented.

For retaining the burial sites and graves, the SAHRA Burial Grounds and Graves (BGG) unit requires a detailed Heritage Management Plan (HMP) clearly outlining a grave management plan that provides details of grave management and access protocols. In addition, the HMP should also provide detailed change finds protocol or procedures in the case of the identification human remains.

The primary aim of the Burial Grounds and Graves Management Plan therefore is to assist in the implementation of mitigation measures to reduce potential negative impacts through the modification of the proposed project development design.

2. Legal Implications

South Africa's unique and non-renewable archaeological and palaeontological heritage sites, inclusive of burial grounds and graves, are 'generally' protected in terms various laws and by-laws:

- Nationally: National Heritage Resources Act, No. 25 of 1999;
- Provincially: KwaZulu-Natal Heritage Act, No. 4 of 2008.

In addition, the following also refer specifically to burial grounds and graves:
- Human Tissue Act, No. 65 of 1983;
- Section 46 of the National Health Act, No. 61 of 2003;
- Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925)
- By-laws:
    - R363 of 2013: Regulations Relating to the Management of Human Remains
    - Local Authorities Notice 34 of 2017, Cemeteries, Crematoria and Funeral Undertakers By-Laws as per Provincial Gazette of 7 April 2017 No. 2800.

In terms of the National Heritage Resources Act, No. 25 of 1999, graves and burial grounds are divided into the following categories:
- Ancestral graves;
- Royal graves and graves of traditional leaders;
- Graves of victims of conflict;
- Graves of individuals designated by the Minister by notice in the Gazette;
- Historical graves and cemeteries; and
- Other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);

For KwaZulu-Natal, the KwaZulu-Natal Heritage Act No. 4 of 2008, graves and burial grounds are divided into the following categories:
- Clause 34: Clause 34 seeks to generally protect, against damage or alteration, graves of victims of conflict.
- Clause 35: Clause 35 seeks to generally protect, against damage or alteration, traditional burial places.

- Clause 40: Clause 40 seeks to give special protection to graves of members of the Royal Family listed in the schedule.

In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

- Destroy, damage, alter, exhume or remove from its original position of otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- Destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- Bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Marked graves younger than 60 years do not fall under the protection of the NHRA (Act No. 25 of 1999) with the result that exhumation, relocation and reburial can be conducted by a register undertaker. This will include logistical aspects such as social consultation, purchasing of plots in cemeteries, procurement of coffins, etc.

Marked graves older than 60 years are protected by the NHRA (Act No. 25 of 1999) an as a result an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. Unmarked graves are by default regarded as older than 60 years and therefore also falls under the NHRA (Act No. 25 of 1999, Section 36).

For graves in KwaZulu-Natal permission is required as follows:

- Clause 34: Approval of the Council must first be sought;
- Clause 35: Approval of the Council must first be sought;
- Clause 40: Nothing is stated in the Act.

3. Management Plan

3.1 *Definitions*

Heritage Site Management: Heritage site management is the control of the elements that make up 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. A site management plan is designed to retain the significance of the place. It ensures that the preservation, enhancement, presentation and maintenance of the place/site is deliberately and thoughtfully designed to protect the heritage values of the place (from: *SAHRA Site management plans: guidelines for the development of plans for the management of heritage sites or places*).

Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

3.2 *Heritage management plan (HMP)*

3.2.1 Phase 1: Site identification and verification

This part of the process usually take place during the Phase 1 heritage impact assessment and is discussed in Section 7 of the main body of the HIA.

Locality and identification:

- The location of the identified site (e.g. farm name, GPS coordinates) is given;

- Determination of the number of graves and the date range of the burials.

The physical condition of the site is also described in terms of:
- The condition of the burial grounds and graves, e.g. has the headstones been pushed over;
- The approximate number of graves and the date range of the graves;
- Is the site fenced off;
- Is there access to the site, in the case it is fenced off;
- Has the site recently been visited by next of kin or other individuals;
- The status of the vegetation cover on the site.

3.2.2 Phase 2: Determination of the potential impact on the identified sites

Identified impacts on the graves and burial sites are calculated and discussed in Section 8.1 of the main body of the HIA.

The second phase consists of information that should be collected in order to develop the conservation management plan. This includes:
- The needs of the client;
- External needs, i.e. the next of kin;
- Requirements for the maintenance of the cultural significance.

From the above an evaluation is made of the impact of the proposed development project on the status of each of the identified burial grounds and graves.

3.2.3 Phase 3: Mitigation measures

Proposed mitigation measures for each identified burial ground or graves are developed and is discussed in the main body of the HIA (Section 8.2).

The main aim of the mitigation measures, as far as is feasible, is to remove any physical, direct impacts on the burial grounds and graves.

- A minimum buffer of 20m must be established around known burial grounds and graves for the duration of the mining/construction phase. This is relevant where the burial site has been static for a considerable period of time and has already been fenced off;
- In cases the burial site is still in use and might expand in the future and is not fenced off, a minimum buffer of 100m should be implemented;
- In the case where blasting takes place during mining activities, the buffers should increase correspondingly to 200m;
- The buffers must be clearly demarcated, and signage placed during the construction/mining period;
- Access to the graves should be allowed to the descendants. However, they should adhere to the managing authorities' conditions regarding permissions, appointments, health, environment and safety.
- The areas with graves should be kept clean and the grass short so that visitors may enter it without any concerns.
    - However, this might create problems as in many cases not all graves are well-marked, carrying the possibility that they might inadvertently be damaged and therefore contractors/land-owners might not be will to accept this responsibility. The descendants should therefore be held responsible for the maintenance of the site.

- Sites that are located close to access/haul roads might need additional mitigation. All personnel and especially drivers of heavy haul vehicles should be informed where these sites are, and they should keep to the speed limits (usually 30km/h on mining sites);
- Any change in the development layout, future development plans, condition of the grave sites and individual graves should immediately be reported to the heritage inspector/SAHRA for guidance;
- Relevant strategies should be put in place for the managing of the burial grounds and graves after the closure of the mine or the completion of the project. It needs to be stated that the land-owner or developer always will be responsible for the preservation of the site. Therefore, measures should be put in place to ensure that the site is handled appropriately after closure, which, in essence would entail the continuation measures already put in place;

3.3 *Management strategy*

A general approach to this is set out in Section 9 of the main body of the HIA report and is equally applicable to general heritage sites and feature as well as to burial grounds and graves.

A strategy for the implementation of the conservation plan is developed:

- A heritage practitioner should be appointed to develop a heritage induction program and conduct training for the ECO, as well as team leaders, in the identification of heritage resources and artefacts;
- Known sites must be demarcated and fenced off and signage placed during the construction/mining period;
- This management strategy should be applicable to the construction, operation as well as the post operation phases of the development/mining activities.
- Relevant strategies should be put in place for the managing of the burial grounds and graves after the closure of the mine or the completion of the project. It needs to be stated that the land-owner or developer always will be responsible for the preservation of the site. Therefore, measures should be put in place to ensure that the site is handled appropriately after closure, which, in essence would entail the continuation measures already put in place;
- The managing authority should be able to regularly inspect the sites in order to ensure that construction and other such activities do not damage the graves;
    - SAHRA and the relevant PHRA are the competent authorities responsible for the regulation of the HMP in terms of the national legislative framework. The NHRA states:

        36(1) *Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make the necessary arrangement for their conservation as they see fit.*

4. Relocation of graves

Once it has been decided to relocate particular graves, the following steps should be taken:

- Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law.
- Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law.
- Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.
- During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.

- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a requirement by law.
- Once the 60 days has passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been received, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any items found in the grave.

Information needed for the SAHRA permit application:

- The permit application needs to be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.
- If graves have not been identified and there are no headstones to indicate the grave, these are then unknown graves and should be handled as if they are older than 60 years. This information also needs to be given to SAHRA.
- A letter from the landowner giving permission to the developer to exhume and relocate the graves.
- A letter from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

5. Defining next of kin

An extensive Burial Grounds and Graves Consultation process must be implemented in accordance with NHRA Regulations to identify bona fide next of kin and reach agreement regarding relocation of graves.

Anthropologically speaking three type of kin are distinguished: patrilineal (called *agnates*), maternal (*uterine* kin) and kin by marriage (*affines*). All three categories have their important part to play in social life.

In terminologies used in the west the close-knit group of family members is clearly marked off from other kin - family terms, such as ‘father’, ‘mother’, ‘brother’ and ‘sister’ are never used for aunts, uncles and cousins.

In many non-western societies this is not the case and the family is merged with the wider group of kin and the family terms are applied much more widely. Next of kin for the Southern Bantu-language speakers is based on a classificatory system where a man uses a term to refer to three significant relatives – his father, his father’s brother and his mother’s brother.

For example, a man (A) may call his father’s brother (i.e. uncle) also a father. All of that latter person’s children will then also be called his (A) brothers and sisters, prohibiting him from marrying any of them (however, *vide* preferred marriages). In Anthropology this system is referred to as the Iroquois system (with reference to the North American Indian tribe where it was first described). When a man calls his father’s brother ‘father’ a suffix is usually added to indicate whether he is an elder or junior brother (e.g. (*ra)mogolo* = elder brother; (*ra)ngwane* = junior brother; also (*ra)kgadi* = younger sister; (*ma)lome* = mother’s brother)(SePedi terminology is used).

Consultants having to relocate graves might find it confusing if they do not have insight into this complex system of kinship, where, for example a single individual can have more than one father or mother.

5. Chance find procedures

A general approach to this is set out in Section 9 of the main body of the HIA report and is equally applicable to general heritage sites and features as to burial grounds and graves.

- A heritage practitioner should be appointed to develop a heritage induction program and conduct training for the ECO, as well as team leaders, in the identification of heritage resources and artefacts;
- An appropriately qualified heritage consultant should be identified to be called upon if any possible heritage resources or artefacts are identified;
- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities be halted;
- The qualified archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and impact on the heritage resource;
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the material and data are recovered;
- Should the heritage consultant conclude that the find is a heritage resource protected in terms of the NHRA (1999) Sections 34, 35, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), he or she should notify SAHRA and/or the relevant PHRA;
- Based on the comments received from SAHRA and/or the PHRA, the heritage consultant would present the relevant terms of reference to the client for implementation;
- Construction/Operational activities can commence as soon as the site has been cleared and signed off by the archaeologist.

6. Curriculum vitae

Johan Abraham van Schalkwyk

Personal particulars

Date of birth:	14 April 1952
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Qualifications

1995 DLitt et Phil (Anthropology), University of South Africa
1985 MA (Anthropology), University of Pretoria
1981 BA (Hons), Anthropology, University of Pretoria
1979 Post Graduate Diploma in Museology, University of Pretoria
1978 BA (Hons), Archaeology, University of Pretoria
1976 BA, University of Pretoria

Non-academic qualifications

12th HSRC-School in Research Methodology - July 1990
Dept. of Education and Training Management Course - June 1992
Social Assessment Professional Development Course - 1994
Integrated Environmental Management Course, UCT - 1994

Professional experience

Private Practice
2017 - current: Professional Heritage Consultant

National Museum of Cultural History
1992 - 2017: Senior researcher: Head of Department of Research. Manage an average of seven researchers in this department and supervise them in their research projects. Did various projects relating to Anthropology and Archaeology in Limpopo Province, Mpumalanga, North West Province and Gauteng. Headed the Museum's Section for Heritage Impact Assessments.
1978 - 1991: Curator of the Anthropological Department of the Museum. Carried out extensive fieldwork in both anthropology and archaeology

Department of Archaeology, University of Pretoria
1976 - 1977: Assistant researcher responsible for excavations at various sites in Limpopo Province and Mpumalanga.

Awards and grants

1. Hanisch Book Prize for the best final year Archaeology student, University of Pretoria - 1976.
2. Special merit award, National Cultural History Museum - 1986.
3. Special merit award, National Cultural History Museum - 1991.
4. Grant by the Department of Arts, Culture, Science and Technology, to visit the various African countries to study museums, sites and cultural programmes - 1993.
5. Grant by the USA National Parks Service, to visit the United States of America to study museums, sites, tourism development, cultural programmes and impact assessment programmes - 1998.
6. Grant by the USA embassy, Pretoria, under the Bi-national Commission Exchange Support Fund, to visit cultural institutions in the USA and to attend a conference in Charleston - 2000.
7. Grant by the National Research Foundation to develop a model for community-based tourism - 2001.

8. Grant by the National Research Foundation to develop a model for community-based tourism - 2013. In association with RARI, Wits University.

Publications
Published more than 70 papers, mostly in scientifically accredited journals, but also as chapters in books.

Conference Contributions
Regularly presented papers at conferences, locally as well as internationally, on various research topics, ranging in scope from archaeology, anthropological, historical, cultural historical and tourism development.

Heritage Impact Assessments
Since 1992, I have done more than 2000 Phase 1 and Phase 2 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, roads, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.

Latest publications
Van Schalkwyk, J.A. 2020. A cognitive approach to ordering of the world: some case studies from the Sotho- and Tswana-speaking people of South Africa. In Whitley, D.S., Loubser, J.H.N. & Whitelaw, G. (eds.) *Cognitive Archaeology. Mind, Ethnography, and the Past in South African and Beyond*. London: Routledge. Pp. 184-200.

Namono, C. & Van Schalkwyk, J.A. 2020. Appropriating colonial dress in the rock art of the Makgabeng plateau, South Africa. In Wingfield, C., Giblin, J. & King, R. (eds) *The pasts and presence of art in South Africa: Technologies, Ontologies and Agents*. University of Cambridge: McDonald Institute for Archaeological Research. Pp. 51-62.