HIA for the Driefontein Mining Project

The Driefontein Mining Project is Situated on Portion 6 of the Farm Sterkstroom 400JS, Portion 5, and a Section of Portion 6 of the Farm Driefontein 398JS in the Middelburg Magisterial District of the Mpumalanga Province.

Heritage Impact Assessment (HIA)

Issue Date: 8 June 2022
Revision No.: 2
Project No.: 609HIA

Head Office:
906 Bergarend Streets
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South Africa

Offices in South Africa, Kingdom of Lesotho and Mozambique

Directors: HS Steyn, PD Birkholtz, W Fourie

Declaration of Independence

- I, Michelle Sachse, declare that –
- General declaration:
- I act as the independent heritage practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting heritage impact assessments, 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 will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

Disclosure of Vested Interest

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

HERITAGE CONSULTANT: PGS Heritage (Pty) Ltd
CONTACT PERSON: Michelle Sachse – Archaeologist
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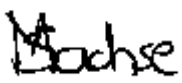
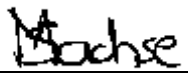
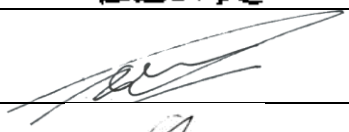
Email: michelle@pgsheritage.co.za

SIGNATURE: 

ACKNOWLEDGEMENT OF RECEIPT

Report Title	HIA for the Driefontein Mining Project The Driefontein Mining Project is Situated on Portion 6 of the Farm Sterkstroom 400JS, Portion 5, and a Section of Portion 6 of the Farm Driefontein 398JS in the Middelburg Magisterial District of the Mpumalanga Province.		
Control	**Name**	**Signature**	**Designation**
Author	M Sachse		PGS Heritage - Archaeologist
Internal Review	W Fourie		PGS Heritage - Project Manager/Archaeologist
Reviewed	T Olivier		uKhozi Environmentalists -

CLIENT: uKhozi Environmentalists

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SIGNATURE: _____

The Heritage Impact Assessment Report has been compiled considering the National Environmental Management Act (Act No. 107 of 1998) (NEMA): Appendix 6 of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended, 2017) requirements for specialist reports as indicated in the table below.

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	**Relevant section in report**
1.(1) (a) (i) Details of the specialist who prepared the report	Page ii of Report – Contact details and company
(ii) The expertise of that person to compile a specialist report including a curriculum vita	Section 1.2 – refer to Appendix C
(b) A declaration that the person is independent in a form as may be specified by the competent authority	Page ii of the report
(c) An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1
(cA) An indication of the quality and age of base data used for the specialist report	
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 2.1 and Section 5
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 4.4
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Appendix A and B
(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 6
(g) An identification of any areas to be avoided, including buffers	Section 6
(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;	Section 4.3, Figure 9, Figure 41
(i) A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.3
(j) A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 4

(k) Any mitigation measures for inclusion in the EMPr	Section 6
(l) Any conditions for inclusion in the environmental authorisation	Section 6
(m) Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 6
(n)(i) A reasoned opinion as to whether the proposed activity, activities or portions thereof should be authorised and	Section 6
(n)(iA) A reasoned opinion regarding the acceptability of the proposed activity or activities; and	
(n)(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 6
(o) A description of any consultation process that was undertaken during carrying out the study	A public participation process was handled as part of the EAP process and is not elaborated on here.
(p) A summary and copies if any comments that were received during any consultation process	Not applicable. To date no comments regarding heritage resources that require input from a specialist have been raised.
(q) Any other information requested by the competent authority.	Not applicable.
(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.	No protocols or minimum standards for HIAs or PIAs promulgated through a governmental notice.

EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd was appointed by uKhozi Environmentalists (Pty) Ltd to undertake a Heritage Impact Assessment (HIA) that forms part of the Environmental Impact Assessment (EIA) for the Driefontein Mining Project situated on Portion 6 of the farm Sterkstroom 400 JS, Portion 5, and a section of Portion 6 of the farm Driefontein 398 JS in the Middelburg Magisterial District of the Mpumalanga Province.

The HIA identified various heritage resources within the study area of which only the burial grounds and graves could be rated as having a high heritage significance and may require further mitigation work before the project can continue. In addition, a preliminary investigation based on the SAHRIS palaeosensitivity map identified the presence of geological deposits of Very High palaeontological sensitivity underlying the location of the study area.

Fieldwork

The fieldwork component of the study was aimed at identifying tangible remains of archaeological, historical and heritage significance. The fieldwork was undertaken by way of intensive walkthroughs of the proposed footprint area. The first phase of the fieldwork was conducted on 11 June 2019. The fieldwork team consisted of two archaeologists from PGS Heritage (John Anderson and Jennifer Kitto). The second phase of the fieldwork was conducted on 6 May 2022. The fieldwork team consisted of one archaeologist and one field assistant from PGS Heritage (Michelle Sachse and Xander Fourie).

During the first phase of the fieldwork a total of thirteen (13) heritage features and resources where identified. These consisted of thirteen (13) burial grounds (**DFN-01, DFN-02, DFN-03, DFN-04, DFN-05, DFN-06, DFN-07, DFN-08, DFN-09, DFN-10, DFN-11, DFN-12,** and **DFN-13**). During the second phase of the fieldwork one (1) new burial ground with only two (2) graves were identified (**DFN-14**).

However, five (5) of the previously identified burial grounds (DFN-01, DFN-02, DFN-07, DFN-09 and DFN-10) have been destroyed by ground clearing and deforestation activities in the area as well as newly established maize fields, since the initial survey in 2019.

Burial grounds and graves

Thirteen burial grounds are present on the property. Burial grounds and graves have high heritage significance and are given a Grade IIIA significance rating in accordance with the system described in Section 3.1 of this document.

The pre-mitigation impact significance is rated as HIGH, but with the implementation of the required mitigation measures the post-mitigation impact will be VERY LOW.

The remaining nine identified burial grounds and graves will not be impacted directly by the planned mining activities. These burial grounds should be retained and avoided with at least a 100m buffer as per SAHRA guidelines. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of s36 of the NHRA and its regulations as well as the National Health Act and its regulations.

Structures

No historical structures were identified so there is no impact to be assessed.

Palaeontology

The proposed development is primarily underlain by the Vryheid Formation (Ecca Group, Karoo Supergroup), According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group, Karoo Supergroup) is Very High (Almond and Pether 2008, SAHRIS website).

A one-day site specific field survey of the proposed Driefontein Coal Mine footprint was conducted on foot and by motor vehicle on 14 May 2022. No visible evidence of fossiliferous outcrops was found. The scarcity of fossil heritage at the proposed development footprint indicates that the impact of the proposed opencast mine will be of a moderate significance in palaeontological terms. It is therefore considered that the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.

Conclusion

It is the combined considered opinion of the heritage specialists that the proposed project will have a direct impact on several identified heritage resources rated being of high heritage significance.

With the implementation of recommended mitigation measures the overall impact on heritage resources will be reduced to acceptable levels during all phases of the project.

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TERMINOLOGY AND ABBREVIATIONS

Archaeological resources

This includes:

- material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- features, structures, and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- carrying out any works on or over or under a place;
- subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- constructing or putting up for display signs or boards;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, or removal of vegetation or topsoil

Early Stone Age

The archaeology of the Stone Age between 700 000 and 2 500 000 years ago.

Fossil

Mineralised bones of animals, shellfish, plants, and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage

That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage resources

This means any place or object of cultural significance and can include (but not limited to) as stated under Section 3 of the NHRA,

- 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, and
- sites of significance relating to the history of slavery in South Africa;

Holocene

The most recent geological time period which commenced 10 000 years ago.

Late Stone Age

The archaeology of the last 30 000 years associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800's, associated with iron-working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30 000-300 000 years ago, associated with early modern humans.

Palaeontology

Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Abbreviations	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
ECO	Environmental Control Officer
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
PSSA	Palaeontological Society of South Africa
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency

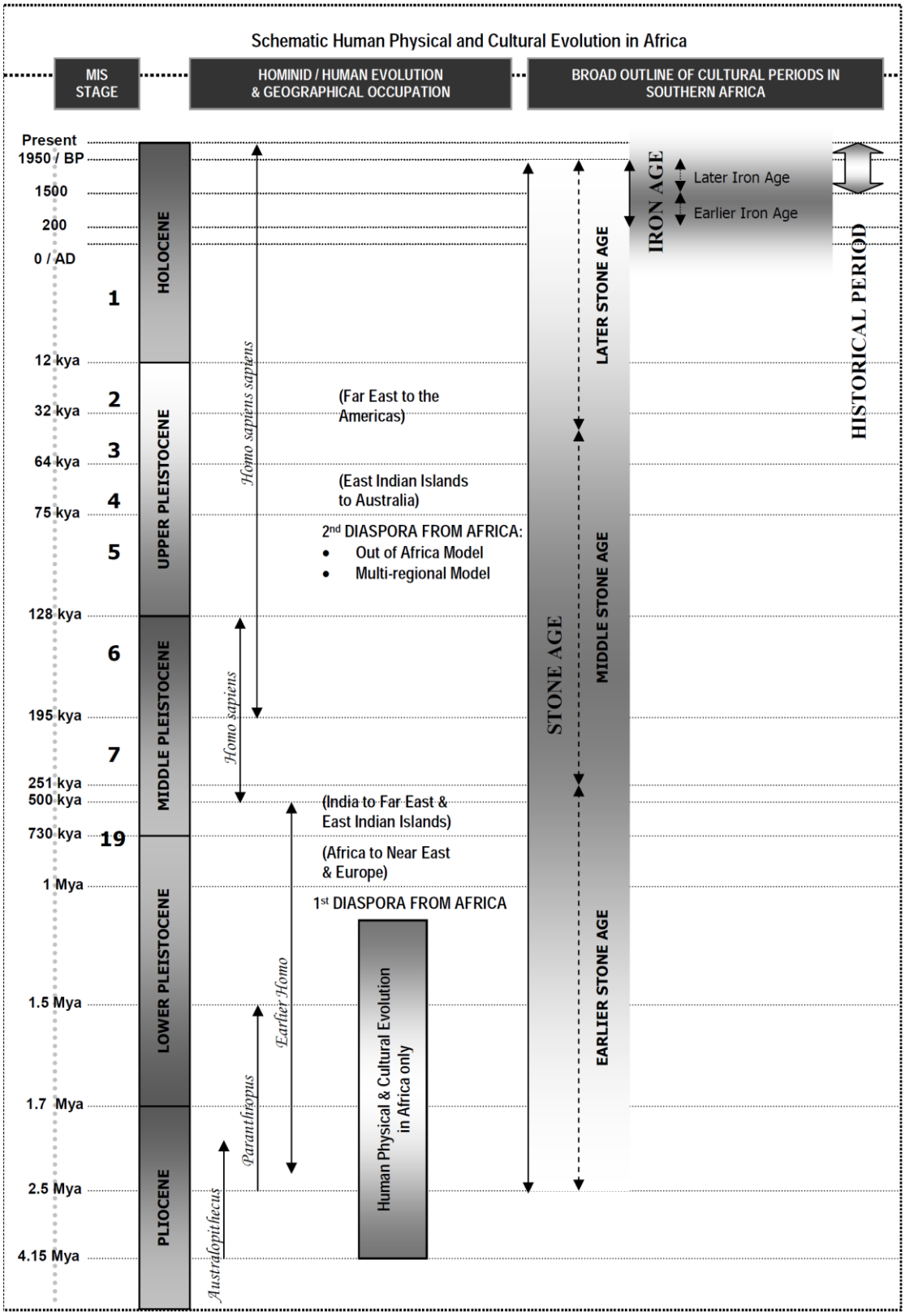


Figure 1: Human and Cultural Timeline in Africa (Morris, 2008)

1 INTRODUCTION

PGS Heritage (Pty) Ltd was appointed by uKhozi Environmentalists (Pty) Ltd to undertake a Heritage Impact Assessment (HIA) that forms part of the Environmental Impact Assessment (EIA) for the Driefontein Mining Project situated on Portion 6 of the farm Sterkstroom 400 JS, Portion 5 and a section of Portion 6 of the farm Driefontein 398 JS in the Middelburg Magisterial District of the Mpumalanga Province.

1.1 Scope of the Study

The aim of the study is to identify possible heritage sites and finds that may occur in the proposed mining area. The HIA aims to inform the EIA to assist the developer in managing the discovered heritage resources in a responsible manner, to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

1.2 Specialist Qualifications

This HIA Report was compiled by PGS Heritage (PGS).

The staff at PGS has a combined experience of nearly 70 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

Wouter Fourie, the Project Coordinator, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is accredited as a Principal Investigator; he is further an Accredited Professional Heritage Practitioner with the Association of Professional Heritage Practitioners (APHP).

Jennifer Kitto, author of this report and Heritage Specialist, has 18 years' experience in the heritage sector, a large part of which involved working for a government department responsible for administering the National Heritage Resources Act, No 25 of 1999. She is therefore well-versed in the legislative requirements of heritage management. She holds a BA in Archaeology and Social Anthropology and a BA (Hons) in Social Anthropology.

Michelle Sachse, the author of this report, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist. She holds a master's degree (MA) in Archaeology from the University of Pretoria.

1.3 Assumptions and Limitations

Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and the current dense vegetation cover. It should be noted that a few small areas were not accessible due to a fence. The far west corner particularly was indicated by the farmer as not being part of their land. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted.

Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. If any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply as set out below.

1.4 Legislative Context

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

- National Environmental Management Act (NEMA), Act 107 of 1998
- National Heritage Resources Act (NHRA), Act 25 of 1999
- Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002

The following sections in each Act refer directly to the identification, evaluation, and assessment of cultural heritage resources:

i. GNR 982 of 2014 (Government Gazette 38282) promulgated under the (NEMA):
   a. Basic Assessment Report (BAR) – Regulations 19 and 23
   b. Environmental Scoping Report (ESR) – Regulation 21
   c. Environmental Impacts Report (EIR) – Regulation 23
   d. Environmental Management Programme (EMPr) – Regulations 19 and 23

ii. NHRA:
   a. Protection of Heritage Resources – Sections 34 to 36; and
   b. Heritage Resources Management – Section 38

iii. MPRDA Regulations of 2014:
   a. Environmental reports to be compiled for application of mining right – Regulation 48
   b. Contents of scoping report– Regulation 49

c. Contents of environmental impact assessment report – Regulation 50
d. Environmental management programme – Regulations 51
e. Environmental management plan – Regulation 52

The NHRA stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority, and that an HIA will be required if a development trigger any of the development types listed in section 38 of the NHRA. Sections 34-36 further stipulate the protections afforded to structures older than 60 years, archaeological and palaeontological sites and material and meteorites, and graves and burial grounds, as well as the process to be followed if these resources need to be disturbed.

NEMA states that an integrated EMP should, (23 -2 (b)) "…identify, predict, and evaluate the actual and potential impact on the environment, socio-economic conditions, and cultural heritage". In addition, the NEMA (No 107 of 1998) and the GNR 982 (Government Gazette 38282, 14 December 2014) state that, "the objective of an environmental impact assessment process is to, … identify the location of the development footprint within the preferred site … focussing on the geographical, physical, biological, social, economic, cultural and heritage aspects of the environment" (GNR 982, Appendix 3(2)(c), emphasis added). In accordance with legislative requirements and EIA rating criteria, the regulations of SAHRA and ASAPA have also been incorporated to ensure that a comprehensive legally compatible HIA report is compiled.

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Locality

The application area falls within the Steve Tshwete Local Municipality (STLM), in the Nkangala District Municipality. The project area includes Portion 6 of the farm Sterkstroom 400 JS, Portion 5 and a section of Portion 6 of the farm Driefontein 398 JS and is situated approximately 16km north-east of the town of Middelburg (**Figure 2** and **Figure 3)**.

2.1.1 Site Description

The application area is situated in the Witbank Coalfield in the northern Karoo Basin that extends over large areas of Gauteng and Mpumalanga. The general landscape is typical of the Highveld Grasslands in that it is of a gently undulating topography, with dispersed perennial and non-perennial streams. The application area experiences a drop from north to south and east to west. Large parts of the application area have been cultivated. Only small portions of the original veld remain along the southern boundary of the application area.

The Middelburg area is characterised by extensive agriculture and mining activities which may pose a threat to the natural environment if not properly managed. Most of the land surrounding the application area is under crop production. Livestock is incorporated and utilise stover and other fodder during the post-harvest period. Crops produced are, among others, maize, soya beans, and potatoes.

Forestry plantations are found directly adjacent to the east of the application area. Existing open cast mining operations are situated to the south (Hakhano Colliery), east (several unknown operations) and north (Bankfontein Colliery) of the application area. The N4 Highway is located approximately 12km to the south of the application area.

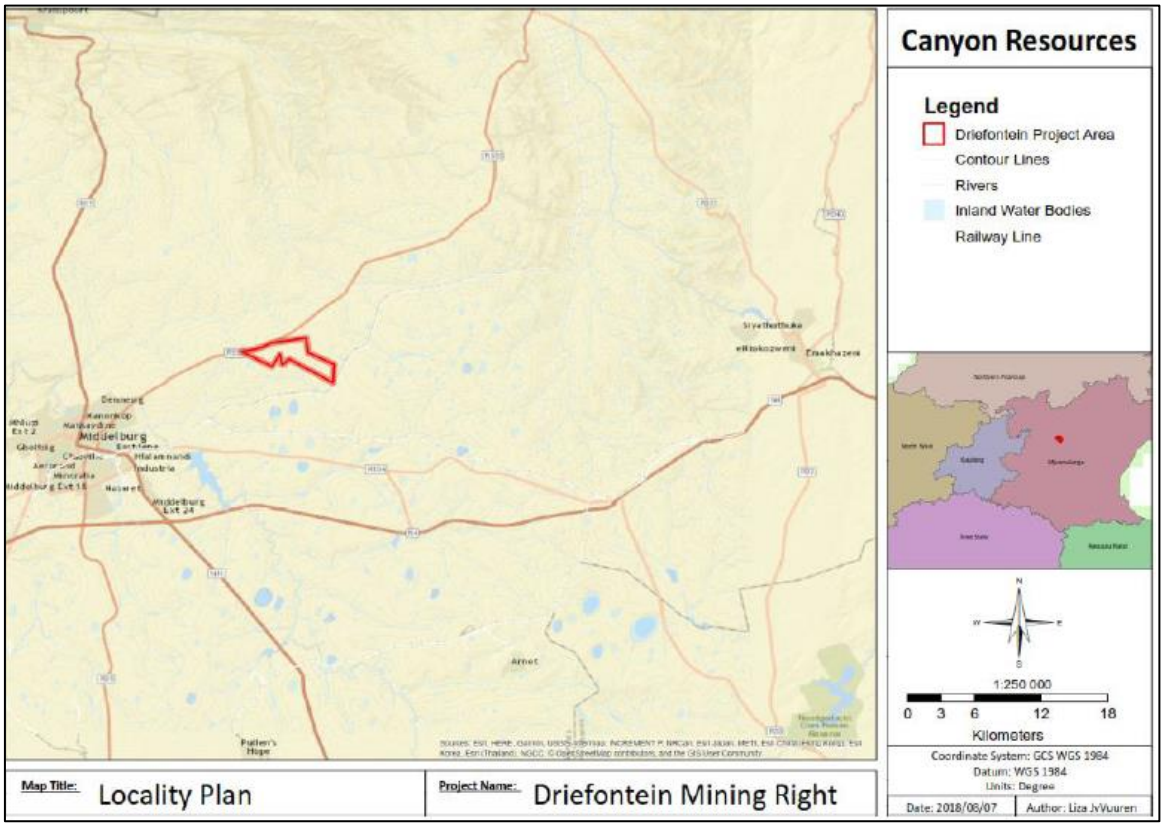


Figure 2: Regional Locality of study area (Image provided by uKhozi, 2018)

Figure 3: Locality of study area (red polygon) in relation to Middelburg

2.2 Technical Project Description

2.2.1 Background

Canyon Resources (Pty) Ltd (Canyon) is a mining and exploration company with current operations in Mpumalanga and Gauteng. The company has four operational mines, Phalanndwa and Phalanndwa Extension in Delmas area, Ukufisa in Springs and Khanye in Bronkhorstspruit area, all four are opencast coal mines mined through the typical truck and shovel method and concurrent rehabilitation is done at the sites. Canyon also has one mine in rehabilitation phase, Singani Colliery, also situated in the Middleburg area, and one mine undergoing care and maintenance, Hakhano Colliery, in the Middleburg area.

The project will involve the development of a new greenfields open cast coal mining operation near Middelburg in the Mpumalanga province. The proposed mine will be located on Portion 6 of the farm Sterkstroom 400 JS, Portion 5, and a section of portion 6 of the farm Driefontein 398 JS situated approximately 20km east of Middelburg. The current land use of the project site is agriculture.

2.2.2 Project description

The application area is 1150ha, but the extent of the area required for mining and associated infrastructure is approximately 412ha. This is because the viable coal reserve only occupies approximately 267ha which is divided in two separate sections found in the northern part (portion 6 of Sterkstroom 400 JS and portion 5 of Driefontein 398 JS) and southeastern corner (portion 6 of

Driefontein 398 JS) of the application area. Canyon proposes to mine two seams from the Ecca Group of the Karoo Supergroup that correlate to the seams in the Witbank Coalfield.

Coal mining will be undertaken by conventional truck and shovel operations and will be opencast only. Concurrent rehabilitation will occur during the operational phase by means of the roll over method. No wash plant will be established on site. Run of Mined (ROM) coal will be transported to the existing Hakhano Colliery washing plant, situated approximately 3km south of the application area, for processing via the existing gravel road (D1433). Opencast mining is carried out using diesel-powered equipment and therefore no power reticulation is anticipated for this area. Water will be sourced from boreholes, ground water inflow to the pit and water captured in the dirty water containment infrastructure (pollution control dam). Water from the pit and run-off water from the contaminated area (stockpile area and workshops) are directed towards the pollution control dam on site. Potable water will be obtained from a borehole.

Key infrastructure planned includes:

- Two opencast mining pits (northern part and south eastern corner);
- Various overburden dumps;
- Topsoil stockpiles;
- Haul roads from pit to ROM stockpile areas;
- Haul roads from ROM stockpile areas to mine access point;
- ROM Stockpile Areas;
- Pollution Control Dams;
- Storm water drains and cut of channels;
- Contractors yard consisting of a workshop, fuel storage facility, offices, change house and a septic tank system;
- Guardhouse at access point.

A preliminary layout plan showing the proposed location of the main mining activities including the location of the haul roads, pollution control dam, ROM stockpiles, topsoil stockpiles, overburden stockpile and clean and dirty water drains and other associated mining infrastructure is presented in Figure 4 below. A Final Site Map will be included in the EIA after the layout has been finalised through the consultative process and specialist studies inputs.

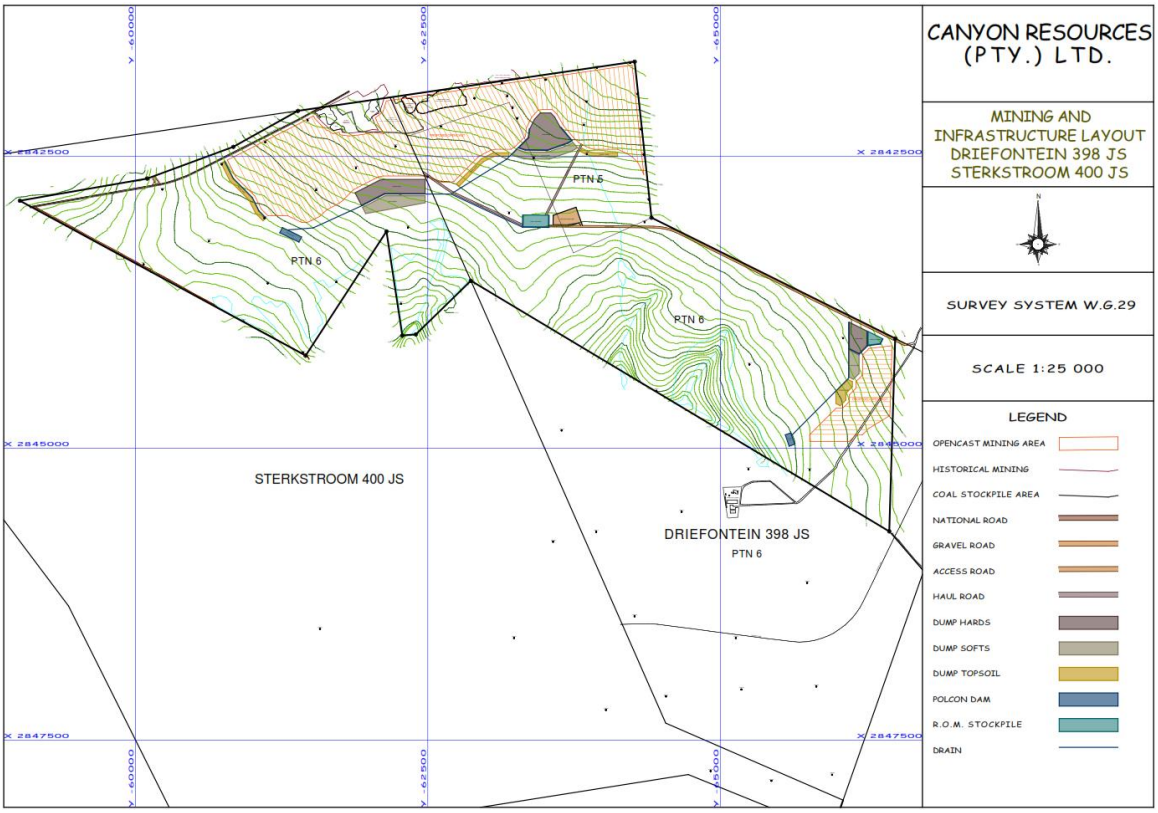


Figure 4: Proposed Infrastructure layout (provided by uKhozi, 2022).

3 ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies utilised in the study.

3.1 Methodology for Assessing Heritage Site significance

This HIA report was compiled by PGS Heritage (PGS) for the proposed Driefontein Mining project. The applicable maps, tables and figures are included, as stipulated in the NHRA (no 25 of 1999) and the National Environmental Management Act (NEMA) (No. 107 of 1998). The HIA process consists of three steps:

Step I – Literature Review and initial site analysis: The background information to the field survey relies greatly on the Heritage Background Research which was undertaken through archival research and evaluation of satellite imagery and topographical maps of the study area.

Step II – Physical Survey: A physical survey was conducted by a combination of vehicle and pedestrian access through the proposed project area by one qualified heritage specialist and one senior experienced field assistant (10 June 2019), aimed at locating and documenting sites falling within and adjacent to the proposed development footprint. Specific attention was paid to the proposed infrastructures footprint areas.

Step III – The final step involves the recording and documentation of relevant heritage resources identified in the physical survey, the assessment of these resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

The significance of heritage sites is based on four main criteria:

- Site integrity (i.e., primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools, and enclosures),
- Density of scatter (dispersed scatter)
    - Low - <10/50m2
    - Medium - 10-50/50m2
    - High - >50/50m2
- Uniqueness; and
- Potential to answer present research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:

A - No further action necessary;

B - Mapping of the site and controlled sampling required;

C - No-go or relocate development activity position;

D - Preserve site, or extensive data collection and mapping of the site; and

E - Preserve site.

Impacts on these sites by the development will be evaluated as follows:

3.1.1 Site Significance

Site significance classification standards use is based on the heritage classification of s3 in the NHRA and developed for implementation keeping in mind the grading system approved by SAHRA for archaeological impact assessments. The update classification and rating system as developed by Heritage Western Cape (2016) is implemented in this report

Site significance classification standards prescribed by the Heritage Western Cape Guideline (2016), were used for the purpose of this report (**Table 1** and **Table 2**).

Table 1: Rating system for archaeological resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance.	May be declared as a National Heritage Site managed by SAHRA. Specific mitigation and scientific investigation can be	Highest Significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
	Current examples: Langebaanweg (West Coast Fossil Park), Cradle of Humankind	permitted in certain circumstances with sufficient motivation.	
II	Heritage resources with special qualities which make them significant, but do not fulfil the criteria for Grade I status. Current examples: Blombos, Paternoster Midden.	May be declared as a Provincial Heritage Site managed by HWC. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	Exceptionally High Significance
III	Heritage resources that contribute to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. Current examples: Varschedrift; Peers Cave; Brobartia Road Midden at Bettys Bay	Resource must be retained. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree.	Resource must be retained where possible where not possible it must be fully investigated and/or mitigated.	Medium Significance
IIIC	Such a resource is of contributing significance.	Resource must be satisfactorily studied before impact. If the recording already done (such as in an HIA or permit application) is not sufficient, further recording or even mitigation may be required.	Low Significance
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate.	No further actions under the NHRA are required. This must be motivated by the applicant or the consultant and approved by the authority.	No research potential or other cultural significance

Table 2: Rating system for built environment resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Robben Island	May be declared as a National Heritage Site managed by SAHRA.	Highest Significance
II	Heritage resources with special qualities which make them significant in the context of a province or region, but do not	May be declared as a Provincial Heritage Site managed by HWC.	Exceptionally High Significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
	fulfil the criteria for Grade I status. Current examples: St George's Cathedral, Community House		
II	Such a resource contributes to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. These are heritage resources which are significant in the context of an area.	This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant that any alteration, both internal and external, is regulated. Such buildings and sites may be representative, being excellent examples of their kind, or may be rare. In either case, they should receive maximum protection at local level.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree. These are heritage resources which are significant in the context of a townscape, neighbourhood, settlement or community.	Like Grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than Grade IIIA examples. They would receive less stringent protection than Grade IIIA buildings and sites at local level.	Medium Significance
IIIC	Such a resource is of contributing significance to the environs These are heritage resources which are significant in the context of a streetscape or direct neighbourhood.	This grading is applied to buildings and/or sites whose significance is contextual, i.e. in large part due to its contribution to the character or significance of the environs. These buildings and sites should, as a	Low Significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
		consequence, only be regulated if the significance of the environs is sufficient to warrant protective measures, regardless of whether the site falls within a Conservation or Heritage Area. Internal alterations should not necessarily be regulated.	
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate.	No further actions under the NHRA are required. This must be motivated by the applicant and approved by the authority. Section 34 can even be lifted by HWC for structures in this category if they are older than 60 years.	No research potential or other cultural significance

3.2 Methodology used in determining the significance of environmental impacts

The methodology used to determine the environmental impact significance was provided by uKhozi Environmental and is explained below.

The methodology used determines the significance of the impacts by evaluating the consequence (extent, duration, and severity) and probability of each impact. The definitions of the terms used within the methodology are provided below, followed by the stepped approach.

Definitions

Aspect – a particular part or feature of something.
Impact – is defined as any change to the environment, whether positive or negative, resulting from a facility/project/development's products, development, and activities.
Cause/Activity – the precipitating factor resulting in a perceived impact.
Mitigation Measures – identified actions and requirements designed to be instituted to reduce the undesirable effects of a perceived impact.
Significance Level – the degree of importance of the impact on the social and/or biophysical environment; a proxy for the degree to which the impact is reversible and may cause irreplaceable loss of a resource. The approach used to determine significance makes use of value judgements to determine the degree of change on the social and/or biophysical environment, after which the consequence and likelihood of the impact are ranked to provide a significance level.
Extent – the spatial scope of the perceived impact. (How large an area will be impacted).
Duration – the temporal scope of the perceived impact, or the period of time during which the social and/or biophysical environment is changed by the impact. (How long the impact will last).
Severity – the degree to which the natural, cultural, and/or social functions and processes of an environment may be affected or altered by a perceived impact. (How extreme/harsh the impact will be. The degree of disturbance).
Probability – the possibility or likelihood of the impact occurring or manifesting.

Approach

The stepped approach used is provided below:

Step 1: The different aspects of the proposed project are identified along with the associated environmental and social impacts which may occur during the construction, operation, decommissioning, and post closure phases.

Step 2: Assess the environmental and social impacts by providing a numerical score for each of the following factors using the ranking scales in **Table 3** (see **Appendix B**).

- Extent;
- Duration;
- Severity;
- Probability

Step 3: Once these factors are ranked for each impact, the significance points are calculated by using the formula below.

Significant Points (SP) = Consequence (Extent + Duration + Severity) x Probability

Step 4: Mitigation measures for each impact are determined during the EIA Phase, and the above approached is repeated to determine the significance of each impact post-mitigation.

Significance Level

The maximum value is 100 significant points. The significance level could therefore be rated as either Very High (VH), High (H), Medium (M), Low (L), or Very Low (VL) on the following basis:

Very Low	There will be an insignificant impact on the environment. No further mitigation measures needed.	SP <20
Low	Where there will not be a significant influence on the environment. Management measures can be proposed to ensure that the significance does not increase.	SP 20 - 39
Medium	Where the impact could have a low to significant influence on the environment unless it is mitigated and/or managed. More easily reversible.	SP 40 - 59
High	Where the impact would have a significant influence on the environment unless mitigated and/or managed. Difficult to reverse.	SP 60 - 79
Very High	Where the impact would have a significant permanent influence on the environment regardless of any possible mitigation, or mitigation is not feasible, and hence must either be avoided or managed.	SP > 80

Table 3:Variables with each category score

CONSEQUENCE		**Extent (Magnitude) of the Impact**	**SP**
	Site	Limited to project area.	1
	Local	Extends beyond project area on a local scale.	2
	Regional	Extends beyond project area on a regional scale.	3
	National	Widespread, far beyond the project area (regional or greater area)	4
		Duration of the Impact	
	Immediate	Quickly reversible.	1
	Short term	0–2 years.	2
	Medium term	2–6 years.	3
	Long term	6–8 years. Ceases with operational life (8 years for this specific project).	4
	Permanent	Impact occurs beyond lifespan of the project.	5
		Severity of the Impact	
	Minor	Disturbance of degraded areas with no conservation value. Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are not affected.	2
	Low	Disturbance of degraded areas with little conservation or resource use value. Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are temporary altered.	4
	Medium	Disturbance of areas with potential conservation or resource use value. Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are significantly altered.	6

	High	Disturbance of pristine areas with important conservation or resource value. Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are permanently altered.	8
	Very High	Disturbance of pristine areas with important conservation or resource value. Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes will permanently cease.	10
Probability	Probability		
	None	0% chance of the impact occurring.	0
	Improbable	The possibility of the impact materializing is very low. 1% to 9% chance of occurrence.	1
	Low Probability	Impact not expected to occur, but conceivable; 10% to 30% chance of occurrence; and Circumstances rarely encountered.	2
	Medium Probability	Impact may occur sometimes; 31 – 60% chance of occurrence; Circumstances occasionally encountered.	3
	High probability	Impact will probably occur; 61 – 90% chance of occurrence; Circumstances frequently encountered;	4
	Almost Certain	91 –100% chance of occurrence.	5

4 HERITAGE BACKGROUND

The high-level archival research focused on available information sources that were used to compile a general background history of the study area and surrounds.

4.1 Archival/historical maps

Historical topographic maps from 1968 to 2010 were available for utilisation in the background study. The maps were utilised to identify structures or graves that could possibly be older than 60 years and thus protected under Section 34 and 36 of the NHRA. Many of the structures identified are farmsteads or homesteads, demarcated as “huts”. One grave site was identified in the same location on all the maps. As discussed in the historical background of the area further on in this report, there is a dense cultural history in Mpumalanga.

4.1.1 Topographical Map 2529DA (First Edition) 1968

A portion of the First Edition of the 2529DA Topographical Sheet is depicted below. The map was based on aerial photography undertaken in 1964 and was surveyed in 1967 and drawn in 1968 by the Trigonometrical Survey Office.

One grave site and several groups of African homesteads (“huts”) are depicted in the location of the study area (yellow circles). The grave site is likely to be 51 years or older.

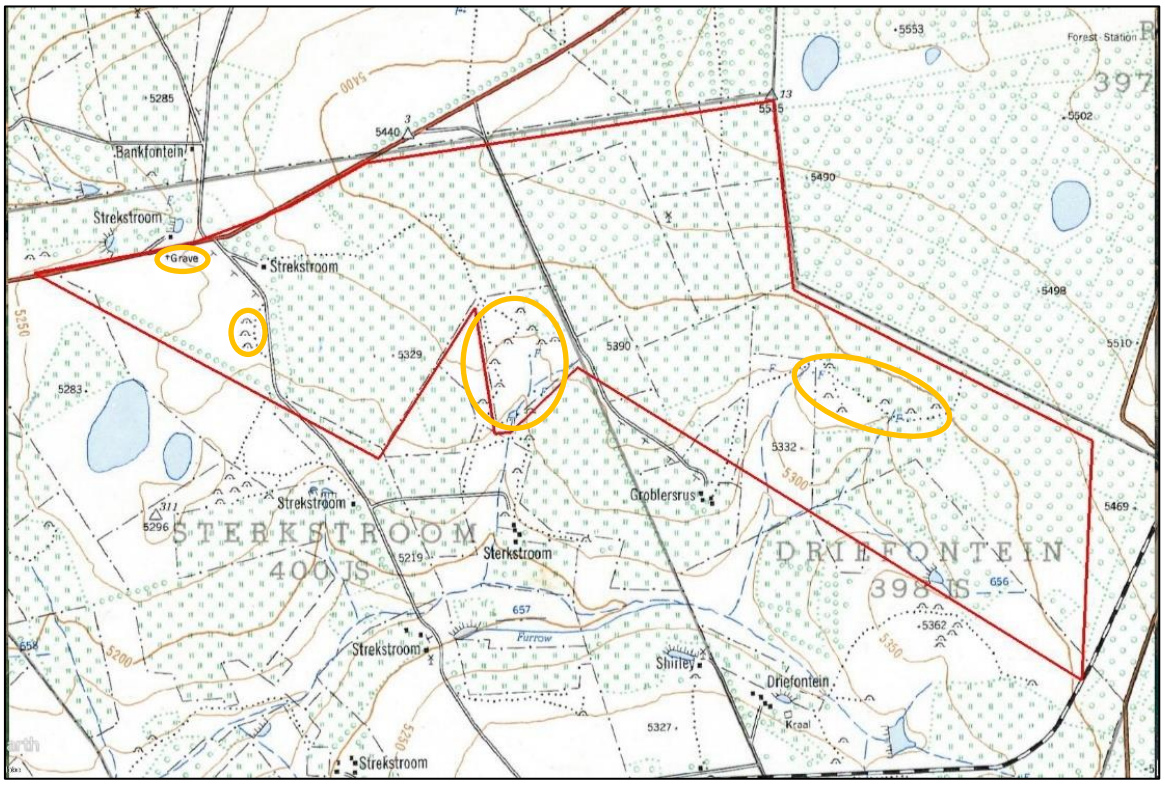


Figure 5: Enlarged portion of the Map 2529DA (Ed 1) 1968, showing the African homestead clusters and grave site (yellow circles).

4.1.2 Topographical Map 2529DA (Second Edition) 1984

A portion of the Second Edition of the 2529DA Topographical Sheet is depicted below. The map was published by the Chief Directorate: Surveys and Land information in 1987 and printed by the Government Printer.

The same grave site and several groups of structures are depicted in the location of the study area (yellow circles). The structures will be less than 60 years old.

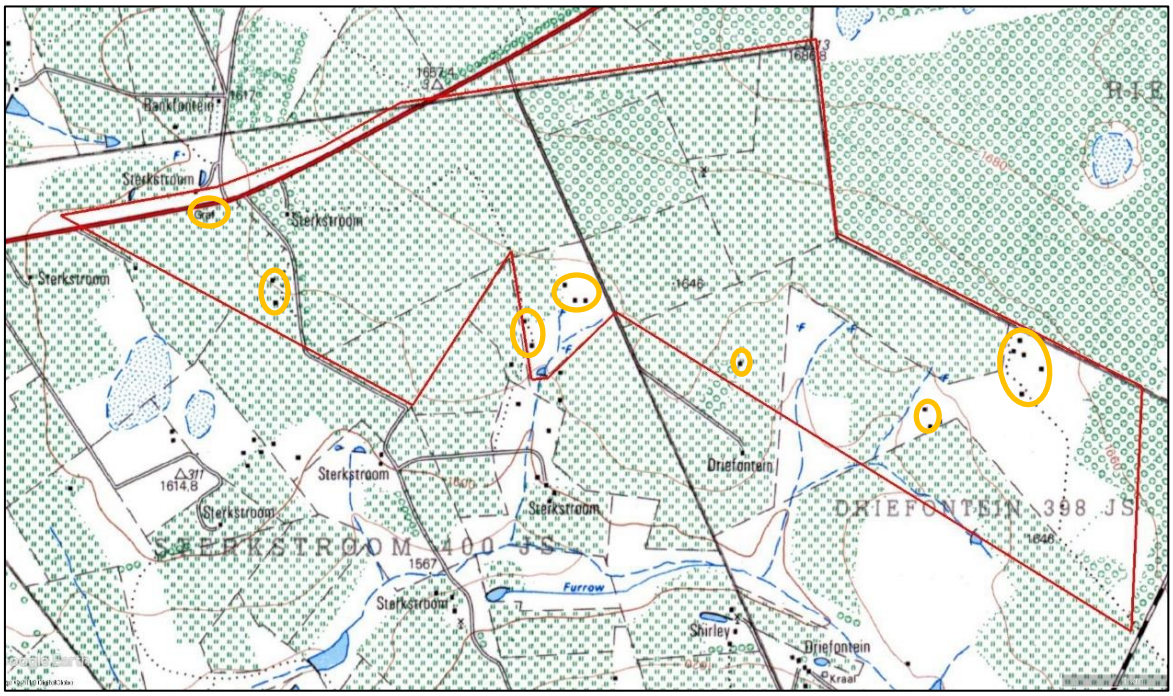


Figure 6: Enlarged portion of the Map 2529DA (Ed 2), 1984, showing the structure groups and grave site (yellow circles).

4.1.3 Topographical Map 2529DA (Third Edition) 2010

A portion of the Third Edition of the 2529DA Topographical Sheet is depicted below. The map was published and printed by the Chief Directorate: National Geo-spatial Information in 2014 by the Government Printer.

Only the grave site depicted in the previous two editions and one structure are depicted on this map.

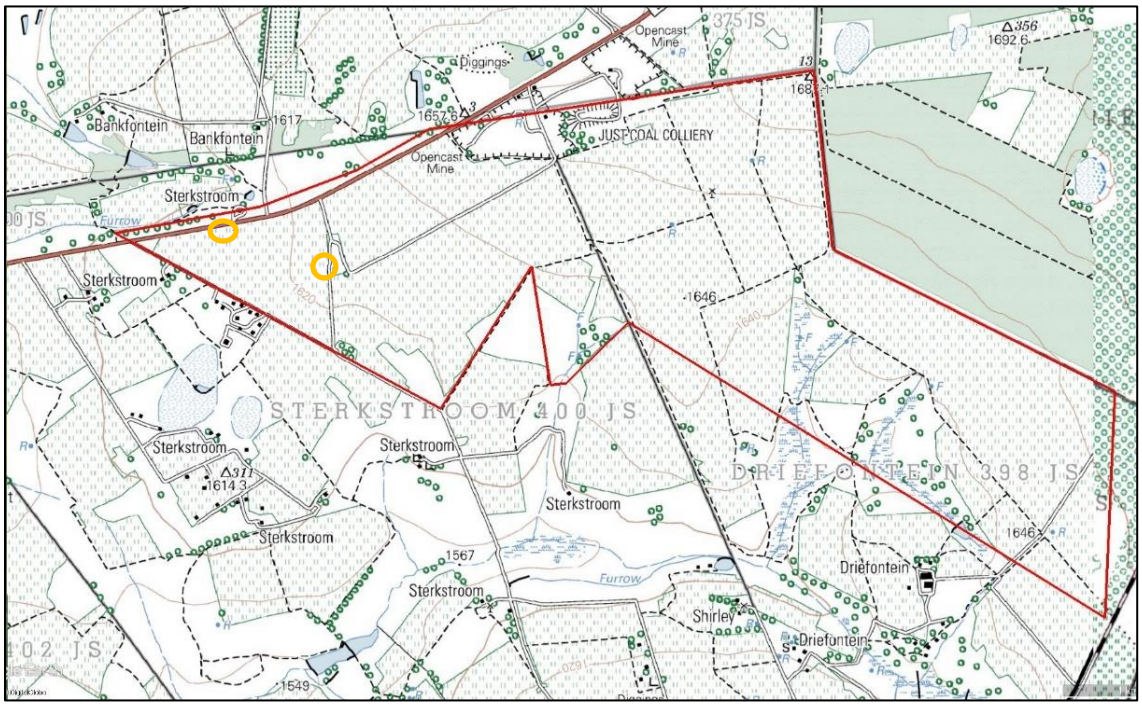


Figure 7: Enlarged portion of the Map 2529DA (Ed 2), 1984, showing the grave site and one structure (yellow circles).

4.2 Aspects of the area's history

4.2.1 Previous Heritage Studies in area

A search on the South African Heritage Resources Information System (SAHRIS) has identified Heritage Impact Assessments conducted in and around the study area: the closest previous studies are the ones by van Schalkwyk (2002), Fourie (2009) and Pistorius (2014).

- Van Schalkwyk J. 2002. A Survey of Cultural Resources for the Arnot Mining Development, Middelburg District, Mpumalanga Province. No sites, structures or objects relating to the Stone Age and Iron Age were found. Ten cemeteries were identified on the farms Springboklaagte 416JS and Kleinfontein 432JS. **One historical stone-built farmstead was also identified.**
- Van Schalkwyk J. 2003. Eskom Transmission Line - Duvha (Witbank) to Janus (Mecklenburg): Cultural Heritage Scoping Report. **No specific heritage sites were identified.**
- Fourie, W. 2009. Heritage Assessment: The Kwagga North Project, Optimum Coal, Arnot, Mpumalanga. **The survey identified 29 cemeteries, 6 historical farmsteads and one quarry site.**
- Kitto, J. 2012. Heritage Impact Assessment Report: Exxaro Paardeplaats Project. **The field work identified a total of 32 heritage sites, including 22 heritage structures, 7 cemeteries and 3 areas with historical mining shafts,**

- Pistorius, J. 2014. A Revised Phase I Heritage Impact Assessment (HIA) Study for the Proposed Rietvlei Open Cast Coal Mining Operation Between Middelburg, Belfast, and Stofberg in the Mpumalanga Province of South Africa. Five graveyards were identified.
- Van der Walt, J. 2018. Heritage Impact Assessment for the Construction of the Zonnebloem Switching Station (132/22kV) and two Loop-in Loop-out Power Lines (132kV), Middelburg, Mpumalanga. **Several structures were the only sites identified.**

4.2.2 Archaeological Background

Table 4: Summary of archival data found on the general area

DATE	DESCRIPTION
2.5 million to 250 000 years ago	The Earlier Stone Age (ESA) is the first phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these is known as Oldowan and is associated with crude flakes and hammer stones. It dates to approximately 2 million years ago. The second technological phase is the Acheulian and comprises more refined and better made stone artefacts such as the cleaver and bifacial hand axe. The Acheulian dates to approximately 1.5 million years ago. No ESA sites are known in the immediate vicinity of the study area. However, this is probably due more to a lack of research on the surroundings of the study area rather than a lack of sites. The closest ESA site is located at Maleoskop near Groblersdal. Concentrations of ESA stone tools have been found in erosion gullies along the Rietspruit (Esterhuysen & Smith, 2007).
250 000 to 40 000 years ago	The Middle Stone Age (MSA) is the second oldest phase identified in South Africa's archaeological history. This phase is associated with flakes, points and blades manufactured by means of the so-called 'prepared core' technique. However, no MSA sites are known in the direct vicinity of the study area. However, this is probably due to a lack of research on the surroundings of the study area rather than a lack of sites. Evidence for the MSA period has been excavated from Bushman Rock Shelter, situated on the farm Klipfonteinhoek in the Ohrigstad District. The MSA layers indicated that the cave was visited repeatedly over a long period, between approximately 40 000 years ago and 27 000 Before Present (Esterhuysen & Smith, 2007).

DATE	DESCRIPTION
40 000 years ago, to the historic past	The Later Stone Age (LSA) is the third archaeological phase identified and is associated with an abundance of very small artefacts known as microliths. No LSA sites are known in the vicinity of the study area. However, this is likely rather due to a lack of research focus on the surroundings of the study area than a lack of sites). Two Later Stone Age (LSA) sites are situated at the farm Honingklip near Badplaas in the Carolina District, (Esterhuysen & Smith, 2007).
AD400-AD1100	**Early Iron Age** Early in the first millennium AD, there seems to be a significant change in the archaeological record of the greater part of eastern and southern Africa lying between the equator and Natal. This change is marked by the appearance of a characteristic ceramic style that belongs to a single stylistic tradition. These Early Iron Age people practised a mixed farming economy and had the technology to work metals like iron and copper. The expansion of early farmers, who, among other things, cultivated crops, raised livestock, mined ore and smelted metals, occurred in this area between AD 400 and AD 1100. Dates from Early Iron Age sites indicate that by the beginning of the 5th century AD Bantu-speaking farmers had migrated down the eastern lowlands and settled in the Mpumalanga Lowveld. Subsequently, farmers continued to move into and between the Lowveld and Highveld of Mpumalanga until the 12th century. These Early Iron Age sites tend to be found in similar locations. Sites were found within 100m of water, either on a riverbank or at the confluence of streams. The proximity to streams meant that the sites were often located on alluvial fans. The nutrient rich alluvial soils would have been favoured for agriculture. The availability of floodplains and naturally wetter soils would have been important for the practice of dryland farming. This may have been particularly so during the Early Iron Age, when climate reconstruction for the interior of South Africa suggests decreased rainfall between AD 900 and AD 1100 and again after AD 1450 (Delius, 2006).
AD 1500-AD 1700	While there is some evidence that the Early Iron Age continued into the 15th century in the Lowveld, on the escarpment it had ended by AD1100. The Highveld, particularly around Lydenburg, Badfontein, Sekhukhuneland, Roossenekal, and Steelpoort, became active again from the 15th century onwards. This later phase, termed the Late Iron Age (LIA), was accompanied by extensive stonewalled settlements (Delius, 2006).

DATE	DESCRIPTION
AD 1700 – AD 1840	The Buispoort facies of the Moloko branch of the Urewe Ceramic Tradition is the first association of the study area's surroundings with the Iron Age. It is most likely dated to between AD 1700 and AD 1840. The key features on the decorated ceramics include rim notching, broadly incised chevrons, and white bands, all with red ochre (Huffman, 2007)
1836	The first Voortrekker parties started crossing over the Vaal River at this time.
1841 – 1850	These years saw the early establishment of farms by the Voortrekkers in the general vicinity of the study area (Bergh, 1999).
1845	Both the district and town of Lydenburg were established in this year (Bergh, 1999). The district of Lydenburg at the time encompassed an extensive area, and the study area fell within this newly proclaimed district at the time.
1855	The town of Middelburg was initially established in 1859 on the farms Klipfontein and Keerom, located on the banks of the Klein-Olifants River. at the time the area was part of the independent Republic of Lydenburg, which had seceded from the Transvaal in 1859 but re-joined in 1860 (Erasmus
1864	In 1864, the site of the town was moved to the adjoining farm, Sterkfontein. However, the town was only laid out in 1866. The town was initially called Nazareth, but was later renamed as Middelburg, in 1874 (Erasmus 2004).
1883 - 1887	By 1872, the study area now fell within the district of Middelburg (Bergh, 1999). During this same year the general surroundings of the study area was visited by a geologist from Eastern Europe Woolf Harris. He visited the general vicinity of the study area in 1872 and identified coal in the Van Dyksdrift area. He is believed to have started the Maggie's Mine the following year (Falconer, 1990). During this period, several small coal mining operations were started in the vicinity of Witbank, but as no railway line connected this area with the coal markets further to the west, it proved a difficult commercial undertaking. By 1889 there were four coal mines in the Witbank area (Falconer, 1990).
1899 – 1902	The South African War took place during this time. No events or activities during the war can be associated with the present study area. However, several such events and activities are known from the general vicinity. These will be briefly mentioned in the paragraphs below.

DATE	DESCRIPTION
	For a short time from June 1900, Middelburg was the seat of the fugitive Transvaal government (Erasmus Two concentration camps were also established in the vicinity of Middelburg, one for whites and one for blacks. The white camp was the largest camp in the Transvaal system, reaching over 7,000 inmates at one point. During September and October 1901 Middelburg camp was gradually reduced in size and the camp was moved to a new site on the banks of the Oliphants River. After the end of the war, repatriation was slow and, by December 1902 there were still 600 people in camp. One reason for the delays was the fact that Middelburg was used as a depot for families returning from Natal. The camp was finally closed in January 1903 (http://www2.lib.uct.ac.za/mss/bccd/Histories/Middelburg/). The area between Witbank and Ermelo major military activity during the latter part of the South African War. The occupation of Pretoria on 5 June 1900, saw the retreat of Boer forces towards the eastern Transvaal (Mpumalanga) and the intensification of the guerrilla warfare activities. Seeking to bring an end to the conflict the British started an advance of the Boer forces from the west (Pretoria) and the south (Ermelo). In April 1901, one of the British Columns under Major-General F.W. Kitchener started with a push from Lydenburg towards the south over the Delagoa-Pretoria rail line to capture the Boer forces under the command of General Ben Viljoen. Between April and August of 1900 numerous skirmishes and engagements took place between British forces (predominantly associated with the Western Australian 5th and 6th Contingents) and retreating Boer commandos *(http://www.thefreelibrary.com/The+action+at+Brakpan.-a0123162112).*
1903	Middelburg attained municipal status in 1903. (Raper 1989)

4.3 Findings of the Heritage Background Study

The findings can be compiled as follows and have been combined to produce a heritage sensitivity map for the project (**Figure 8)**.

4.3.1 Heritage Sensitivity

The sensitivity maps were produced by overlying:

- Satellite Imagery; and
- Historical Topographical Maps dating from the 1960's

This enabled the identification of possible heritage sensitive areas that included:

- Dwellings
- Clusters of dwellings (homesteads and farmsteads);
- Burial grounds and graves;
- Structures/Buildings

By superimposition and analysis, it was possible to rate these structure/areas according to age and thus their level of protection under the NHRA. Note that these structures refer to possible tangible heritage sites as listed in **Table 5.**

Table 5 - Possible heritage sites in the study area

Name	**Description**	**Legislative protection**
Architectural Structures/ Dwellings	Possibly older than 60 years	NHRA Sect 3 and 34
Burial grounds	Graves	NHRA Sect 3 and 36 and MP Graves Act

4.4 Field work findings[1]

During the field work a total of fourteen (14) heritage resource were identified. See the individual sites descriptions below and **Figure 10**.

[1] *Site in this context refers to a place where a heritage resource is located and not a proclaimed heritage site as contemplated under s27 of the NHRA.*

Figure 8: Heritage sensitivity map showing locations of possible heritage features depicted on the topographical maps and satellite imagery: purple polygons = grave/s, orange polygons = homesteads ("huts"), blue polygons = structures.

Objects depicted include burial grounds or possible graves, homesteads, and structures. Observation of the previous heritage reports has shown that graves are in abundance in the surrounding areas and especially near farmsteads. This factor needs to be held in consideration.

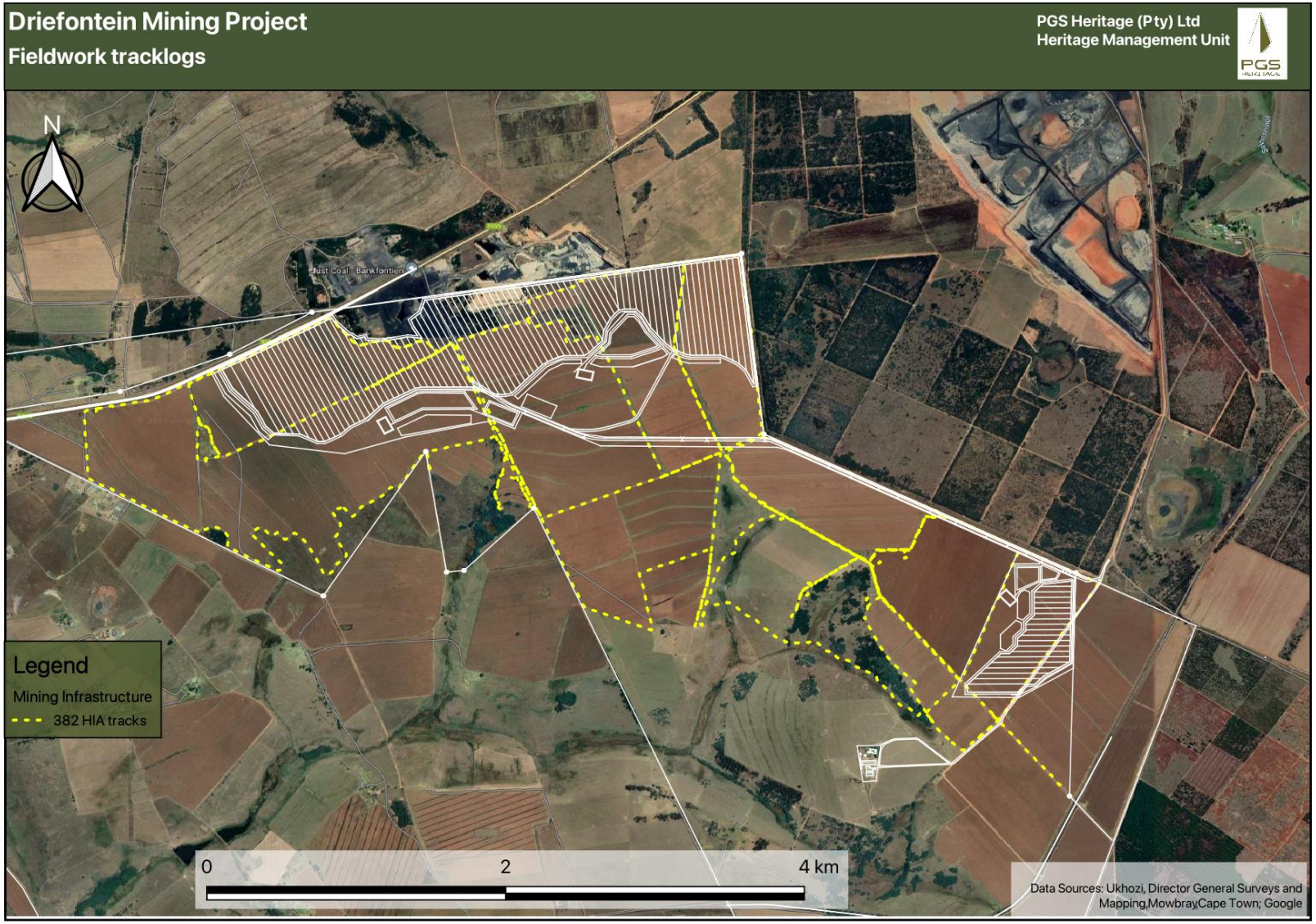


Figure 9: Survey tracklog

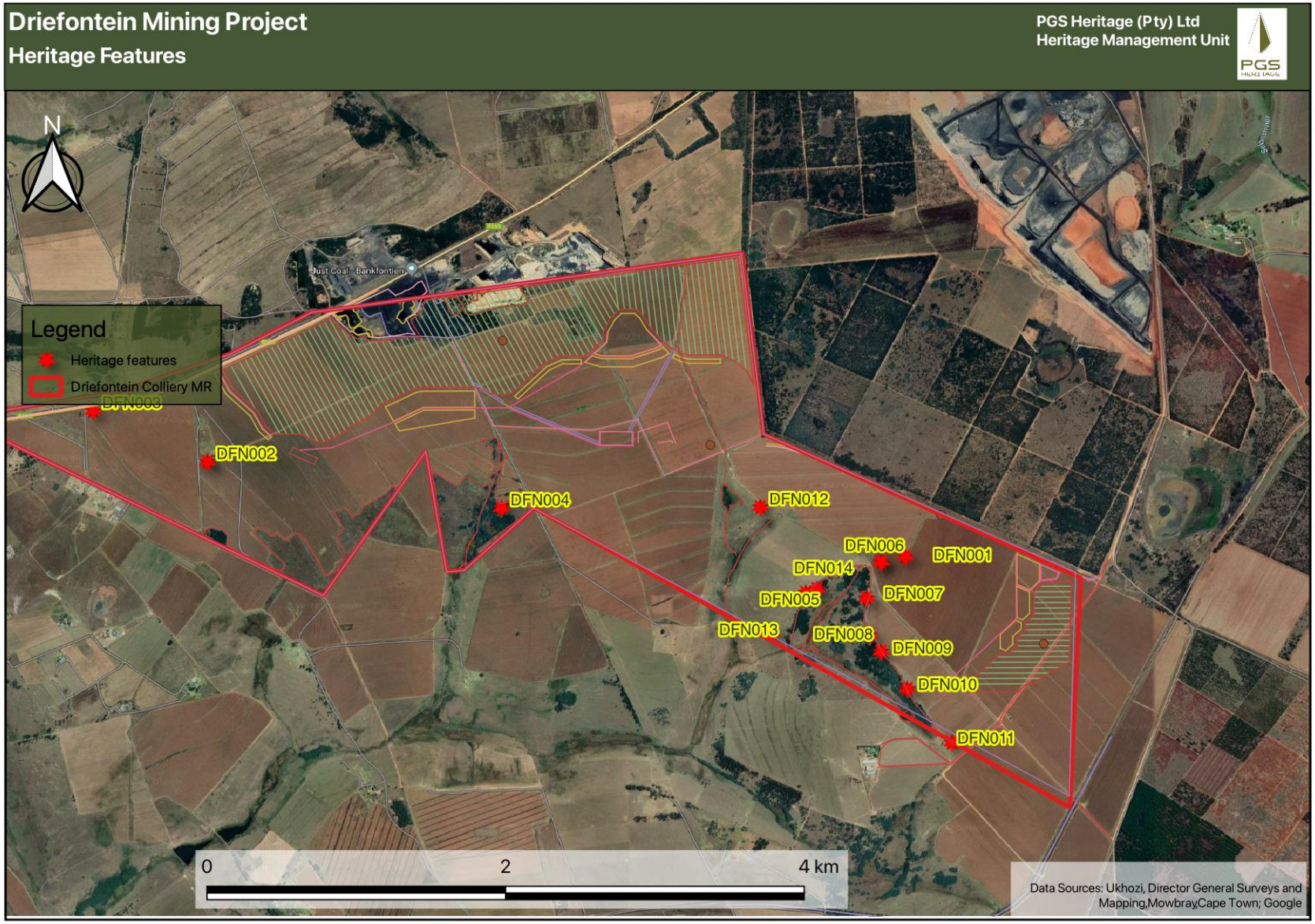


Figure 10: Identified heritage resources

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
DFN001	25° 42.098'S	29° 39.069'E	According to the first phase of the fieldwork, the site consists of an informal burial ground. The graves are mostly stone packed with some having cement or granite dressings. A few have inscribed headstones with African names, but only one had a visible date of death (1978). The cemetery is in the middle of a cultivated ploughed maize field. A grave count revealed approximately 16-20 graves. During the second phase of the fieldwork the graves could not be located as the site is currently in the middle of a cultivated maize field. The graves have mostly likely been destroyed. **Site extent:** Approximately 50m x 50m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 *Figure 11: View of the informal burial ground from the phase one fieldwork.*			 *Figure 12: View of the one headstone with dates and a name from the phase one fieldwork.*		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 *Figure 13: General view of the maize field, during the phase two fieldwork, located where site DFN001 was previously identified.*		
DFN002	25° 42.119'S	29° 38.972'E	According to the first phase of the fieldwork, the site consists of a group of three stones that could be an unconfirmed grave. The site is situated in the same ploughed mielie filed as Site DFN001 and has been avoided. It was identified as a grave by the farmer's son. Site extent: approx. 200m^2 During the second phase of the fieldwork the graves could not be located as the site is currently in the middle of a cultivated maize field. The graves have mostly likely been destroyed. **Site extent:** Approximately 20m x 20m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.		

Figure 14: View of the stones identified as a possible/unconfirmed grave.

Figure 15: View of the grass patch containing the unconfirmed grave.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 *Figure 16: General view of the location of the site DFN002 during the second phase of the fieldwork.*		
DFN003	**25° 41.718'S**	**29° 36.274'E**	The site consists of an informal burial ground. The graves are mostly stone packed with a few inscribed with African names. Only one headstone had a visible date of death (1976). The graves are in a cultivated maize field, very close to the demolished ruins of a few structures. A grave count revealed approximately five graves. A few of the graves seem to have been cleaned recently which indicates that they are being visited by the family. During the second phase of the fieldwork the graves were identified as still visible and not disturbed, although the area is very overgrown. **Site extent:** Approximately 10m x 10m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.		

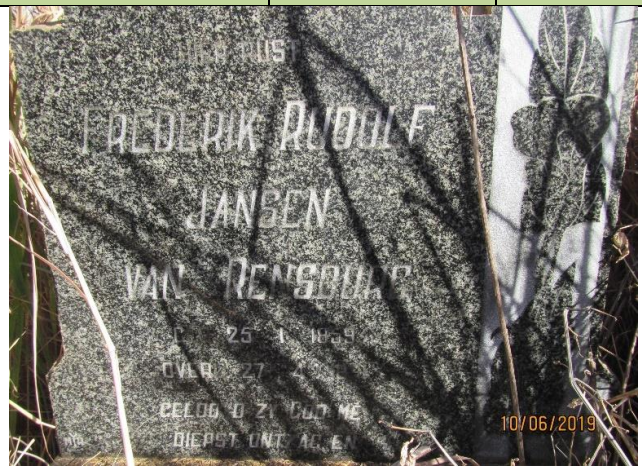
Figure 17: View of the informal burial ground, during the phase one fieldwork, showing the cleaned graves.

Figure 18: View of the one headstone with a name and date of death, pictured during phase one of the fieldwork.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 *Figure 19 - General view of the informal graveyard located at site DFN003, during phase two of the fieldwork.*			 *Figure 20 - View of one of the headstones located in the informal graveyard at site DFN003, during phase two of the fieldwork.*		
DFN004	25° 41.514'S	29° 35.816'E	According to the first phase of fieldwork, the site consists of an informal family burial ground. The visible graves have formal dressings of concrete or granite with inscribed headstones with Afrikaans names. At least one grave is stone packed. The names are mainly Van Heerden and Van Rensburg. The dates of death include 1891, 1905 and 1948. The graves are surrounded by a low pre-cast concrete wall. The burial ground is situated between a field and the northern boundary of the study area. A grave count revealed approximately 20 graves; however, the graves are obscured by extremely long grass. A colony of bees was also noted. During the second phase of the fieldwork the graves were identified as still visible and not disturbed, although the area is very overgrown. **Site extent:** Approximately 20m x 20m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 *Figure 21: View of the wall of the family burial ground, showing the extremely long and dense grass, identified during the phase one fieldwork.*					
 *Figure 22: View of a few of the visible graves, identified during the phase one fieldwork.*					
 *Figure 23: Headstone of Schalk Willem Van Heerden, died 1948, identified during the phase one fieldwork.*					
 *Figure 24: Grave of SW Van Heerden, died 1905, identified during the phase one fieldwork.*					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 *Figure 25: Headstone of Jacoba Susanna Maria Van Heerden, died 1956, identified during the phase one fieldwork.*					
 *Figure 26: Headstone of Jacobus Rudolf Jansen van Rensburg, died 1895, identified during the phase one fieldwork.*					
 *Figure 27: General view of the graveyard DFN004 during the phase two fieldwork.*					
 *Figure 28: General view of the graveyard at site DFN004 during phase two fieldwork, showing the overgrown nature of the site, the graves are hardly visible.*					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
DFN005	25° 41.903'S	29° 37.452'E	According to the first phase of fieldwork, the site consists of an informal burial ground. The graves are mostly stone packed with a few headstones but no inscriptions. The graves are located on the edge of a ploughed maize field, near a patch of black wattle trees. A grave count revealed approximately seven graves. The graves are fenced. Three graves have been cleaned recently and one had grave goods on the dressing, which indicates that they are being visited by the family. During the second phase of the fieldwork the graves were identified as still visible and not disturbed, although the area is very overgrown. **Site extent:** Approximately 30m x 30m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating

Figure 29: View of the informal burial ground, showing the 3 cleaned graves, identified during the phase one fieldwork.

Figure 30: View of the cleaned graves, showing the grave goods on one grave, identified during the phase one fieldwork.

Figure 31: General view of the informal graveyard at site DFN005, during the phase two fieldwork.

Figure 32: General view of the informal graveyard at site DFN005, during the phase two fieldwork.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
DFN006	25° 42.242'S	29° 38.671'E	According to the first phase of the fieldwork, the site consists of a heap of stones which is an unconfirmed grave. It was identified by the farmer's son as a grave. The stone heap is located at the edge of a patch of black wattle trees. A foot search of the ground in the trees did not reveal any other possible grave sites. During the second phase of the fieldwork the possible grave was identified as still visible, although the surrounding area has been disturbed by deforestation and ground clearing activities. **Site extent:** Approximately 5m x 5m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating

Figure 33: View of the stone heap which could be a grave, identified during the phase one fieldwork.

Figure 34: General view of the site DFN006, identified during the phase two fieldwork.

Figure 35: General view of the site DFN006, identified during the phase two fieldwork, showing the ground clearing activities in the surrounding area.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
DFN007	25° 42.264'S	29° 38.915'E	According to the first phase of the fieldwork, the site consists of approximately five stone heaps and scattered stone concentrations. Some of these could be homestead foundations and at least one could be a grave. The site is situated in and around a stand of black wattle trees. It was identified as a grave site by the farmer's son. During the second phase of the fieldwork the possible grave was not identified as the area had been cleared and activities of deforestation had destroyed the site previously identified in 2019. **Site extent:** Approximately 15m x 15m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating

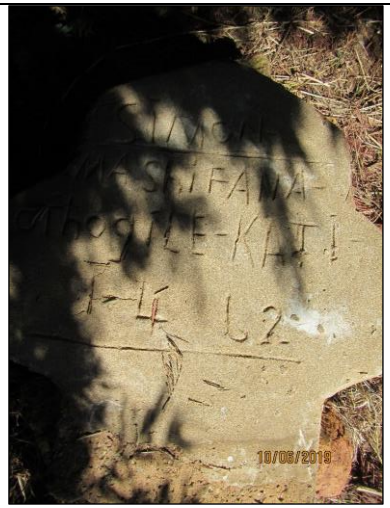
Figure 36: View of the site, showing the scattered stones, identified during the phase one fieldwork.

Figure 37: View of one possible grave, identified during the phase one fieldwork.

Figure 38: General view of the site DFN007, identified during the phase two fieldwork. The site has been destroyed.

Figure 39: General view of the site DFN007, identified during the phase two fieldwork. The site has been destroyed.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
DFN008	25° 42.411'S	29° 38.926'E	According to the first phase of the fieldwork, the site consists of an informal burial ground. The graves are mostly stone packed with a few headstones, at least one had a date of 1962. The graves are located at the edge of a patch of black wattle trees. A grave count revealed approximately twenty graves. The burial ground is fenced. During the second phase of the fieldwork the possible grave was not identified as the area had been cleared and activities of deforestation had destroyed the site previously identified in 2019. **Site extent:** Approximately 20m x 20m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 *Figure 40: View of the informal burial ground, identified during the phase one fieldwork.*			 *Figure 41: Another view of the burial ground, identified during the phase one fieldwork.*		
 *Figure 42: Headstone with name (Jonas Mashi[ane?]) but no visible date*			 *Figure 43: Headstone with name and date (1-4-62)*		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating

Figure 44: General view of the informal graveyard located at site DFN008, identified during the phase one fieldwork.

Figure 45: General view of the informal graveyard located at site DFN008, identified during the phase one fieldwork.

Figure 46: General view of the site DFN008, identified during the phase two fieldwork, showing the cleared and disturbed area next to the graves.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
DFN009	25° 42.478'S	25° 42.478'S	According to the first phase fieldwork, the site contains a single packed stone heap which could be a homestead foundation or a grave. The site is situated in and around a stand of black wattle trees. It was identified as a grave site by the farmer's son. During the second phase of the fieldwork the possible grave was not identified as the area had been cleared and activities of deforestation had destroyed the site previously identified in 2019. **Site extent:** Approximately 2m x 3m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating

Figure 47: View of stone packed stones, possible single grave, identified during the phase one fieldwork.

Figure 48: Closer view of the possible grave, identified during the phase one fieldwork.

Figure 49: General view of the site located at DFN009, identified during the phase two fieldwork. The site has been destroyed.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
DFN010	25° 42.628'S	29° 39.077'E	According to the first phase of the fieldwork, the site contains a single packed stone heap which could be a homestead foundation or a grave. The site is situated in and around a stand of black wattle trees. It was identified as a grave site by the farmer's son. During the second phase of the fieldwork the possible grave was not identified as the area is very overgrown and the surrounding area had been cleared and activities of deforestation had destroyed the site previously identified in 2019. **Site extent:** Approximately 2m x 3m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 *Figure 50: View of stone packed stones, possible single grave, identified during the phase one fieldwork.*		
			 *Figure 51: General view of the site DFN010, identified during the phase two fieldwork.*		

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
DFN011	25° 42.843'S	29° 39.256'E	According to the first phase of the fieldwork, the site consists of two informal graves situated adjacent to the road and within the fence of a field. The site is demarcated by a line of stones as well a fence. One grave is dressed with bricks and cement, and one has a granite dressing and headstone. The headstone was lying on its face, so no inscription was visible. It was identified as a grave site by the farmer's son. During the second phase of the fieldwork the possible graves were identified. **Site extent:** Approximately 10m x 20m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating

Figure 52: View of stone packed stones, possible single grave, identified during the phase one fieldwork.

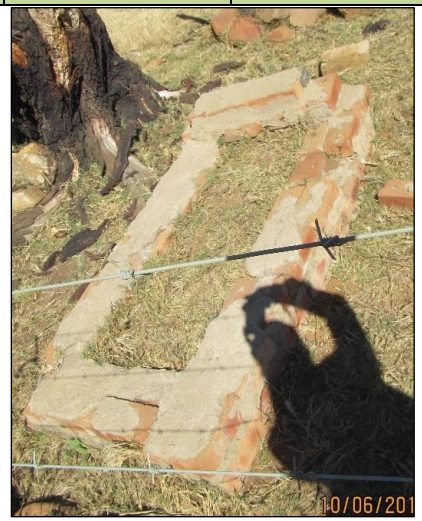


Figure 53: Closer views of the two graves, identified during the phase one fieldwork.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 *Figure 54: General view of the informal graveyard located at site DFN011, identified during the phase two fieldwork.*			 *Figure 55: General view of the informal graveyard located at site DFN011, identified during the phase two fieldwork.*		
DFN012	25° 42.405'S	29° 38.535'E	According to the first phase of the fieldwork, the site consists of a single stone-packed grave. The site is situated a short distance from the road, inside a pastureland field, adjacent to a dead tree. During the second phase of the fieldwork the possible graves were identified. **Site extent:** Approximately 2m x 3m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.		

Figure 56: View of the grave, identified during the phase one fieldwork.

<table>
<tr><th>Site number</th><th>Lat</th><th>Lon</th><th>Description</th><th>Heritage Significance</th><th>Heritage Rating</th></tr>
<tr><td colspan="6"> 
Figure 57: General view of the site located at DFN012, identified during the phase two fieldwork.
 
Figure 58: General view of the site located at DFN012, identified during the phase two fieldwork.</td></tr>
<tr><td>DFN013</td><td>25° 41.900'S</td><td>29° 38.488'E</td><td>According to the first phase of the fieldwork, the site consists of one definite grave and one possible grave. The site is situated close to the south-west boundary of the study area.
During the second phase of the fieldwork the possible graves were identified. The area is very overgrown.

Site extent: Approximately 3m x 6m.

Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families.</td><td>High Significance</td><td>IIIA</td></tr>
</table>

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.		

Figure 59: View with definite grave in foreground and possible grave at the back, identified during the phase one fieldwork.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			 *Figure 60: General view of the site located at DFN013, identified during the phase two fieldwork.*		
DFN014	-25.703790° S	29.645271° E	During the second phase of the fieldwork the graves were identified and recorded. This site was not part of the phase one fieldwork. Previously the area was covered in a dense cluster of trees and as such the graves were missed, the area has now been cleared by deforestation activities and as such the graves were identified. Only two graves are located at the site. **Site extent:** Approximately 5m x 5m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: • The sites should be demarcated and a 100-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ.	High Significance	IIIA

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			• A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). • If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.		

Figure 61: General view of the informal burial ground, identified during the phase two fieldwork. The surrounding area has been cleared by deforestation activities.

Figure 62: View of the two graves located at site DFN014, identified during the phase two fieldwork.

4.5 Palaeontology

The proposed development is primarily underlain by the Vryheid Formation (Ecca Group, Karoo Supergroup), According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group, Karoo Supergroup) is Very High (Almond and Pether 2008, SAHRIS website).

A one-day site specific field survey of the proposed Driefontein Coal Mine footprint was conducted on foot and by motor vehicle on 14 May 2022. No visible evidence of fossiliferous outcrops was found. The scarcity of fossil heritage at the proposed development footprint indicates that the impact of the proposed opencast mine will be of a moderate significance (post mitigation) in palaeontological terms. It is therefore considered that the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.

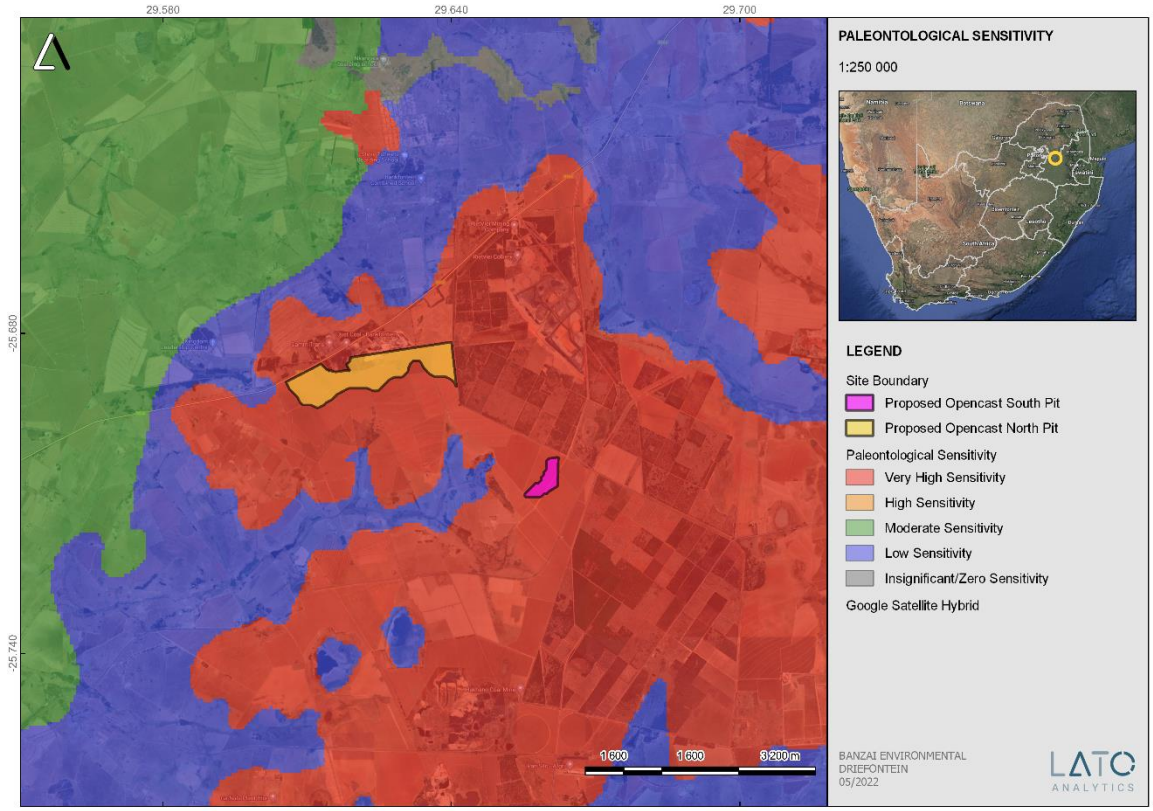


Figure 63: Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences) indicating the proposed development in variegated colours.

5 IMPACT ASSESSMENT

The impact assessment rating is based on the rating scale as contained in **Appendix B**.

The following section provides an analysis of the impact of the proposed mining right area on heritage resources within the study area.

5.1 Burial grounds and graves

Thirteen grave sites and burial grounds were present on the property during the first phase of the fieldwork in 2019. **However, during the second phase of the fieldwork in 2022 it was evident that five of those thirteen previously identified graves sites has been destroyed**. Also, during the second phase of the fieldwork a new grave site has been identified. Burial grounds and graves have high heritage significance and are given a Grade IIIA significance rating in accordance with the system described in Section 3.1 of this document.

The pre-mitigation impact significance is rated as HIGH, but with the implementation of the required mitigation measures the post-mitigation impact will be LOW.

Significant Points (SP) = Consequence (Extent + Duration + Severity) x Probability

5.2 Structures

No historical structures were identified; therefore, no impact can be assessed.

5.3 Palaeontology

The proposed development is primarily underlain by the Vryheid Formation (Ecca Group, Karoo Supergroup), According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group, Karoo Supergroup) is Very High (Almond and Pether 2008, SAHRIS website).

A one-day site specific field survey of the proposed Driefontein Coal Mine footprint was conducted on foot and by motor vehicle on 14 May 2022. No visible evidence of fossiliferous outcrops was found. The scarcity of fossil heritage at the proposed development footprint indicates that the impact of the proposed opencast mine will be of a moderate significance in palaeontological terms.

The pre-mitigation impact significance is rated as HIGH, but with the implementation of the required mitigation measures the post-mitigation impact will be LOW.

It is therefore considered that the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.

5.4 Impact assessment summary table

Implementing the impact assessment methodology as supplied by uKhozi Environmentalists, the following tables provide a quantitative assessment of the impacts of the proposed mining right application.

Aspect	Phase	Extent	Duration	Severity	Probability	Pre-mitigation SP	Extent	Duration	Severity	Probability	Post-mitigation SP
Impact on burial grounds and graves	Construction & Operation	1	5	10	4	64	1	5	2	2	16
Impact on structures older than 60 years	Construction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact on palaeontological resources	Operation	1	5	10	4	60	1	5	8	3	39

6 CONCLUSIONS AND RECOMMENDATIONS

The HIA identified various heritage resources within the study area of which only the burial grounds and graves could be rated as having a high heritage significance and may require further mitigation work before the project can continue. In addition, a preliminary investigation based on the SAHRIS palaeosensitivity map identified the presence of geological deposits of Very High palaeontological sensitivity underlying the location of the study area

6.1 Burial grounds and graves

Thirteen grave sites and burial grounds were present on the property during the first phase of the fieldwork in 2019. **However, during the second phase of the fieldwork in 2022 it was evident that five of those thirteen previously identified graves sites has been destroyed. Also, during the second phase of the fieldwork a new grave site has been identified.**

Currently there are nine burial grounds and graves have high heritage significance and are given a Grade IIIA significance rating in accordance with the system described in Section 3.1 of this document.

The pre-mitigation impact significance is rated as HIGH, but with the implementation of the required mitigation measures the post-mitigation impact will be VERY LOW.

The nine identified burial grounds and graves will not be impacted directly by the planned mining activities. These burial grounds should be retained and avoided with at least a 30-50m buffer. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of s36 of the NHRA and its regulations as well as the National Health Act and its regulations.

6.2 Structures

No historical structures were identified so there is no impact to be assessed.

6.3 Palaeontology

The proposed development is primarily underlain by the Vryheid Formation (Ecca Group, Karoo Supergroup), According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group, Karoo Supergroup) is Very High (Almond and Pether 2008, SAHRIS website).

A one-day site specific field survey of the proposed Driefontein Coal Mine footprint was conducted on foot and by motor vehicle on 14 May 2022. No visible evidence of fossiliferous outcrops was found. The scarcity of fossil heritage at the proposed development footprint indicates that the impact of the proposed opencast mine will be of a moderate significance in palaeontological terms. It is therefore considered that the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.

It is our considered opinion that the impacts as identified and rated on identified and projected heritage resources will sufficiently mitigated to allow the project to continue.

6.4 Heritage Management Plan for EMPr implementation

SITE TYPE	MITIGATION MEASURES	PHASE	TIMEFRAME	RESPONSIBLE PARTY FOR IMPLEMENTATION	MONITORING PARTY (FREQUENCY)	TARGET	PERFORMANCE INDICATORS (MONITORING TOOL)
Burial Grounds	Demarcate sites with a 100-meter buffer as per SAHRA guidelines and avoid them. A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). Stakeholder engagement will need to be implemented in the case where the graves are to be relocated. If this is not possible a detailed grave relocation process must be implemented as required under the NHRA and National Health Act regulations.	Construction & Operation	During construction & operation	Applicant ECO	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
Palaeontology	The ECO for this project must be informed that the Palaeontological Sensitivity of the Vryheid Formation (Ecca Group, Karoo Supergroup) is Very High.	Construction	Construction	Applicant ECO Palaeontologist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA	ECO Monthly Checklist/Report

SITE TYPE	MITIGATION MEASURES	PHASE	TIMEFRAME	RESPONSIBLE PARTY FOR IMPLEMENTATION	MONITORING PARTY (FREQUENCY)	TARGET	PERFORMANCE INDICATORS (MONITORING TOOL)
	If Palaeontological Heritage is uncovered during surface clearing and excavations the **Chance find Protocol** attached should be implemented immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources Agency (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carried out. Before any fossil material can be collected from the development site the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university),					under Section 35 and 38 of NHRA	

SITE TYPE	MITIGATION MEASURES	PHASE	TIMEFRAME	RESPONSIBLE PARTY FOR IMPLEMENTATION	MONITORING PARTY (FREQUENCY)	TARGET	PERFORMANCE INDICATORS (MONITORING TOOL)
	while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012). These recommendations should be incorporated into the Environmental Management Plan for the proposed mining Development						

7 REFERENCES

BERGH, I.S. (ed.). 1999. *Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies*. Pretoria: J.L. van Schaik.

DELIUS P (ed), 2006, *Mpumalanga – Reclaiming the Past, Defining the Future*

ERASMUS, B.P.J. 2004. *On Route in South Africa*. Third edition. Jonathan Ball Publishers: Johannesburg

FALCONER, K.W. 1990. Spotlight on 100 Years of Coal Mining in Witbank in *Journal of the South African Institute of Mining and Metallurgy*, April 1990.

FOURIE, W. 2008. Archaeological Impact Assessments within South African Legislation. *South African Archaeological Bulletin* 63 (187): 77–85, 2008.

FOURIE, W. 2009. *Heritage Assessment: The Kwagga North Project, Optimum Coal, Arnot, Mpumalanga*.

HUFFMAN, T.N. 2007. *Handbook to the Iron Age: The archaeology of Pre-Colonial Farming Societies in Southern Africa.* University of KwaZulu-Natal Press, Scottsville.

KITTO, J. 2012. *Heritage Impact Assessment Report: Exxaro Paardeplaats Project*.

MORRIS, D. 2008. *Archaeological and Heritage Impact Assessment on Remainder of Carter Block 458, near Lime Acres, Northern Cape*. McGregor Museum.

PISTORIUS, J. 2014. *A Revised Phase I Heritage Impact Assessment (HIA) Study For The Proposed Rietvlei Open Cast Coal Mining Operation Between Middelburg, Belfast And Stofberg In The Mpumalanga Province Of South Africa*.

RAPER, PE. 1989. *Dictionary of Southern African Place Names*. Jonathan Ball Publishers SA; 2nd edition

VAN DER WALT, J. 2018. *Heritage Impact Assessment for the Construction of the Zonnebloem Switching Station (132/22kV) and two Loop-in Loop-out Power Lines (132kV), Middelburg, Mpumalanga.*

VAN SCHALKWYK J. 2002. *A Survey of Cultural Resources for The Arnot Mining Development, Middelburg District, Mpumalanga Province.*

VAN SCHALKWYK J. 2003. *Escom Transmission Line - Duvha (Witbank) To Janus (Mecklenburg): Cultural Heritage Scoping Report.*

APPENDIX A

HERITAGE ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies utilised in the study.

This HIA report was compiled by PGS Heritage (PGS) for the proposed Driefontein Mining project. The applicable maps, tables and figures are included, as stipulated in the NHRA (no 25 of 1999) and the National Environmental Management Act (NEMA) (No. 107 of 1998). The HIA process consists of three steps:

Step I – Literature Review and initial site analysis: The background information to the field survey relies greatly on the Heritage Background Research which was undertaken through archival research and evaluation of satellite imagery and topographical maps of the study area.

Step II – Physical Survey: A physical survey was conducted by a combination of vehicle and pedestrian access through the proposed project area by one qualified heritage specialist and one senior experienced field assistant (10 June 2019), aimed at locating and documenting sites falling within and adjacent to the proposed development footprint. Specific attention was paid to the proposed infrastructures footprint areas.

Step III – The final step involves the recording and documentation of relevant heritage resources identified in the physical survey, the assessment of these resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

The significance of heritage sites is based on four main criteria:

- Site integrity (i.e., primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools, and enclosures),
- Density of scatter (dispersed scatter)
    - Low - <10/50m2
    - Medium - 10-50/50m2
    - High - >50/50m2
- Uniqueness; and
- Potential to answer present research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:

A - No further action necessary;

B - Mapping of the site and controlled sampling required;

C - No-go or relocate development activity position;

D - Preserve site, or extensive data collection and mapping of the site; and

E - Preserve site.

Impacts on these sites by the development will be evaluated as follows:

Site Significance

Site significance classification standards use is based on the heritage classification of s3 in the NHRA and developed for implementation keeping in mind the grading system approved by SAHRA for archaeological impact assessments. The update classification and rating system as developed by Heritage Western Cape (2016) is implemented in this report

Site significance classification standards prescribed by the Heritage Western Cape Guideline (2016), were used for the purpose of this report (**Table 1** and **Table 2**).

Table 6: Rating system for archaeological resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Langebaanweg (West Coast Fossil Park), Cradle of Humankind	May be declared as a National Heritage Site managed by SAHRA. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	Highest Significance
II	Heritage resources with special qualities which make them significant, but do not fulfil the criteria for Grade I status. Current examples: Blombos, Paternoster Midden.	May be declared as a Provincial Heritage Site managed by HWC. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	Exceptionally High Significance
III	Heritage resources that contribute to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. Current examples: Varschedrift; Peers Cave; Brobartia Road Midden at Bettys Bay	Resource must be retained. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree.	Resource must be retained where possible where not possible it must be fully investigated and/or mitigated.	Medium Significance
IIIC	Such a resource is of contributing significance.	Resource must be satisfactorily studied before impact. If the recording already done (such as in an HIA or permit application) is not sufficient, further recording or even mitigation may be required.	Low Significance
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to	No further actions under the NHRA are required. This must be motivated by the applicant or the	No research potential or other cultural significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
	be retained as part of the National Estate.	consultant and approved by the authority.	

Table 7: Rating system for built environment resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Robben Island	May be declared as a National Heritage Site managed by SAHRA.	Highest Significance
II	Heritage resources with special qualities which make them significant in the context of a province or region, but do not fulfil the criteria for Grade I status. Current examples: St George's Cathedral, Community House	May be declared as a Provincial Heritage Site managed by HWC.	Exceptionally High Significance
II	Such a resource contributes to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. These are heritage resources which are significant in the context of an area.	This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant that any alteration, both internal and external, is regulated. Such buildings and sites may be representative, being excellent examples of their kind, or may be rare. In either case, they should receive maximum protection at local level.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree. These are heritage resources which are significant in the context of a townscape, neighbourhood, settlement or community.	Like Grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than Grade IIIA examples. They would receive less stringent protection than Grade	Medium Significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
		IIIA buildings and sites at local level.	
IIIC	Such a resource is of contributing significance to the environs These are heritage resources which are significant in the context of a streetscape or direct neighbourhood.	This grading is applied to buildings and/or sites whose significance is contextual, i.e. in large part due to its contribution to the character or significance of the environs. These buildings and sites should, as a consequence, only be regulated if the significance of the environs is sufficient to warrant protective measures, regardless of whether the site falls within a Conservation or Heritage Area. Internal alterations should not necessarily be regulated.	Low Significance
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate.	No further actions under the NHRA are required. This must be motivated by the applicant and approved by the authority. Section 34 can even be lifted by HWC for structures in this category if they are older than 60 years.	No research potential or other cultural significance

APPENDIX B

ENVIRONMENTAL IMPACT METHODOLOGY

The methodology used determines the significance of the impacts by evaluating the consequence (extent, duration, and severity) and probability of each impact. The definitions of the terms used within the methodology are provided below, followed by the stepped approach.

Definitions

Aspect – a particular part or feature of something.
Impact – is defined as any change to the environment, whether positive or negative, resulting from a facility/project/development's products, development, and activities.
Cause/Activity – the precipitating factor resulting in a perceived impact.
Mitigation Measures – identified actions and requirements designed to be instituted to reduce the undesirable effects of a perceived impact.
Significance Level – the degree of importance of the impact on the social and/or biophysical environment; a proxy for the degree to which the impact is reversible and may cause irreplaceable loss of a resource. The approach used to determine significance makes use of value judgements to determine the degree of change on the social and/or biophysical environment, after which the consequence and likelihood of the impact are ranked to provide a significance level.
Extent – the spatial scope of the perceived impact. (How large an area will be impacted).
Duration – the temporal scope of the perceived impact, or the period of time during which the social and/or biophysical environment is changed by the impact. (How long the impact will last).
Severity – the degree to which the natural, cultural, and/or social functions and processes of an environment may be affected or altered by a perceived impact. (How extreme/harsh the impact will be. The degree of disturbance).
Probability – the possibility or likelihood of the impact occurring or manifesting.

Approach

The stepped approach used is provided below:

Step 1: The different aspects of the proposed project are identified along with the associated environmental and social impacts which may occur during the construction, operation, decommissioning, and post closure phases.

Step 2: Assess the environmental and social impacts by providing a numerical score for each of the following factors using the ranking scales in the Variables Ratings table below.

- Extent;
- Duration;
- Severity;
- Probability

Step 3: Once these factors are ranked for each impact, the significance points are calculated by using the formula below.

Significant Points (SP) = Consequence (Extent + Duration + Severity) x Probability

Step 4: Mitigation measures for each impact are determined during the EIA Phase, and the above approached is repeated to determine the significance of each impact post-mitigation.

Significance Level

The maximum value is 100 significant points. The significance level could therefore be rated as either Very High (VH), High (H), Medium (M), Low (L), or Very Low (VL) on the following basis:

Very Low	There will be an insignificant impact on the environment. No further mitigation measures needed.	SP <20
Low	Where there will not be a significant influence on the environment. Management measures can be proposed to ensure that the significance does not increase.	SP 20 - 39
Medium	Where the impact could have a low to significant influence on the environment unless it is mitigated and/or managed. More easily reversible.	SP 40 - 59
High	Where the impact would have a significant influence on the environment unless mitigated and/or managed. Difficult to reverse.	SP 60 - 79
Very High	Where the impact would have a significant permanent influence on the environment regardless of any possible mitigation, or mitigation is not feasible, and hence must either be avoided or managed.	SP > 80

Variables with each category score

CONSEQUENCE		**Extent (Magnitude) of the Impact**	**SP**
	Site	Limited to project area.	1
	Local	Extends beyond project area on a local scale.	2
	Regional	Extends beyond project area on a regional scale.	3
	National	Widespread, far beyond the project area (regional or greater area)	4
		Duration of the Impact	
	Immediate	Quickly reversible.	1
	Short term	0–2 years.	2
	Medium term	2–6 years.	3
	Long term	6–8 years. Ceases with operational life (8 years for this specific project).	4
	Permanent	Impact occurs beyond lifespan of the project.	5
		Severity of the Impact	
	Minor	Disturbance of degraded areas with no conservation value. Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are not affected.	2
	Low	Disturbance of degraded areas with little conservation or resource use value. Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are temporary altered.	4
	Medium	Disturbance of areas with potential conservation or resource use value. Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are significantly altered.	6

	High	Disturbance of pristine areas with important conservation or resource value. Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are permanently altered.	8
	Very High	Disturbance of pristine areas with important conservation or resource value. Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes will permanently cease.	10
Probability	**Probability**		
	None	0% chance of the impact occurring.	0
	Improbable	The possibility of the impact materializing is very low. 1% to 9% chance of occurrence.	1
	Low Probability	Impact not expected to occur, but conceivable; 10% to 30% chance of occurrence; and Circumstances rarely encountered.	2
	Medium Probability	Impact may occur sometimes; 31 – 60% chance of occurrence; Circumstances occasionally encountered.	3
	High probability	Impact will probably occur; 61 – 90% chance of occurrence; Circumstances frequently encountered;	4
	Almost Certain	91 –100% chance of occurrence.	5

APPENDIX C

PGS TEAM CVs

WOUTER FOURIE

Professional Heritage Specialist and Professional Archaeologist and Director PGS Heritage

Summary of Experience

Specialised expertise in Archaeological Mitigation and excavations, Cultural Resource Management and Heritage Impact Assessment Management, Archaeology, Anthropology, Applicable survey methods, Fieldwork and project management, Geographic Information Systems, including *inter alia* -

Involvement in various grave relocation projects (some of which relocated up to 1000 graves) and grave "rescue" excavations in the various provinces of South Africa

Involvement with various Heritage Impact Assessments, within South Africa, including -

- Archaeological Walkdowns for various projects
- Phase 2 Heritage Impact Assessments and EMPs for various projects
- Heritage Impact Assessments for various projects
- Iron Age Mitigation Work for various projects, including archaeological excavations and monitoring
- Involvement with various Heritage Impact Assessments, outside South Africa, including -
- Archaeological Studies in Democratic Republic of Congo
- Heritage Impact Assessments in Mozambique, Botswana and DRC
- Grave Relocation project in DRC

Key Qualifications

BA [Hons] (Cum laude) - Archaeology and Geography - 1997

BA - Archaeology, Geography and Anthropology - 1996

Professional Archaeologist - Association of Southern African Professional Archaeologists (ASAPA) - Professional Member

Accredited Professional Heritage Specialist – Association of Professional Heritage Practitioners (APHP)

CRM Accreditation (ASAPA) -

- Principal Investigator - Grave Relocations
- Field Director – Iron Age
- Field Supervisor – Colonial Period and Stone Age
- Accredited with Amafa KZN

Key Work Experience

2003- current - Director – Professional Grave Solutions (Pty) Ltd

2007 – 2008 - Project Manager – Matakoma-ARM, Heritage Contracts Unit, University of the Witwatersrand

2005-2007 - Director – Matakoma Heritage Consultants (Pty) Ltd

2000-2004 - CEO– Matakoma Consultants
1998-2000 - Environmental Coordinator – Randfontein Estates Limited. Randfontein, Gauteng
1997-1998 - Environmental Officer – Department of Minerals and Energy. Johannesburg, Gauteng

Worked on various heritage projects in the SADC region including, Botswana, Mauritius, Malawi, Zambia, Mozambique, and the Democratic Republic of the Congo

PROFESSIONAL CURRICULUM FOR MICHELLE SACHSE

Professional Archaeologist for PGS Heritage

Summary of Experience

Involvement in various grave relocation projects in the various provinces of South Africa.
Expertise in Heritage Impact Assessment Surveys, Historical and Archival Research, Archaeology, Fieldwork including *inter alia* -

Involvement with various Heritage Impact Assessments,

- Heritage Impact Assessments within Gauteng, Limpopo, Mpumalanga, Free State, North West and the Northern Cape and Western Cape Province.
- Archaeological Walkdowns for various projects.
- Desktop, archival and heritage screening for projects.
- Instrument Survey and recording for various projects.

Heritage Impact Assessments:

- Proposed New Pit for Msobo Coal (Spitzkop Colliery), in Ermelo, within the Mpumalanga Province. **Position:** Heritage Specialist.
- The Proposed Harmony FSS6 Reclamation Pipeline, Welkom, Free State Province. **Position:** Heritage Specialist.
- Heritage Impact Assessment Report, for the Proposed Kalgold Expansion Project between Mafikeng and Vryburg, the North West Province. **Position:** Heritage Specialist.
- Heritage Impact Assessment Report, for the Proposed Chartwell Data Centre Project in Chartwell, Johannesburg, Gauteng Province. **Position:** Heritage Specialist.
- Proposed Development on Portions of the Farm Rondebult 303 JS, Near Kwa-Guqa, Emalahleni Local Municipality, Nkangala District Municipality, Mpumalanga Province. **Position:** Heritage Specialist.
- The 40MW Buffelspoort Solar Photovoltaic (PV) Energy Facility, on Portions 75 and 91 of the Farm Buffelspoort 343 JQ, between Buffelspoort and Mooinooi, in the North West Province. **Position:** Heritage Specialist.

Grave Relocation Projects:

- Report on the Relocation of Graves: Relocation of 22 Graves at Nkomati Anthracite Mine on the Farm Fig Tree 503 JU, near Madadeni Mpumalanga Province.
- Report on the Relocation of Graves: Relocation of 27 Graves Located on the Farm Welstand 55 IS, near Kriel, Mpumalanga Province.
- Report on the Relocation of Graves: Relocation of 6 Graves Located on the Farm Klipfontein 241 IS, near Breyten, Mpumalanga province.

- Report on the Relocation of Graves. Relocation of 68 Graves Located at Erf 4460, 4461 and 4463, Kudube Unit 4, in Hammanskraal, Gauteng Province.

Key Qualifications

2016 - 2019	MA in Archaeology University of Pretoria, Pretoria
2015	BA Honours in Archaeology University of Pretoria, South Africa
2012 - 2014	BA (General) University of Pretoria, South Africa Major subjects: Archaeology and History

Professional Qualifications

Professional Archaeologist - Association of Southern African Professional Archaeologists - Professional Member – No 526

Key Work Experience

- 2020 – to date: Archaeologist - PGS Heritage
- 2018 – 2019: Assistant Manager at the Archaeology Laboratory on South Campus at the University of Pretoria