



PGS HERITAGE

THE PROPOSED MOOPLAATS COLLIERY EXPANSION, GERT SIBANDE DISTRICT MUNICIPALITY, MPUMALANGA PROVINCE

Heritage Impact Assessment

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Declaration of Independence

I, Wouter Fourie, 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;



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ACKNOWLEDGEMENT OF RECEIPT

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EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd (PGS) was appointed by Geo Soil and Water cc (GSW) to undertake a Heritage Impact Assessment (HIA) which will serve to inform the Environmental Impact Assessment Report (EIA) and Environmental Management Programme (EMPr) for the proposed Mooiplaats Colliery Expansion, Gert Sibande District Municipality, Mpumalanga Province.

This report focusses on the four (4) areas proposed for the drilling of four (4) rescue bay boreholes and their associated access roads.

Heritage resources are unique and non-renewable and as such, any impact on such resources must be seen as significant. The HIA has shown that the study area and surrounding area has some heritage resources situated within the proposed development boundaries. Through data analysis and a site investigation, the following issues were identified from a heritage perspective.

Heritage Sites

Intensive field surveys of the study area were undertaken on foot by comprising one field archaeologist on 15 September 2020. No archaeological sites or burial grounds and graves were identified during the fieldwork.

Impact Assessment

No evidence for any archaeological or heritage sites could be identified. As a result, no impact is expected from the proposed development on heritage.

According to the Palaeontological Desktop assessment (PDA), the proposed development is underlain by the by Karoo Dolerite and Vryheid Formation (Ecca Group; Karoo Supergroup). According to the PalaeoMap of South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of Karoo Dolerite (malific intrusions) is insignificant while the Palaeontological Sensitivity of the Vryheid Formation is Very High. Refer to Chapter 7.

Mitigation measures

With no impact expected on heritage, no further mitigation is required. Refer Chapter 8 of this report.

General

It is the author's considered opinion that the overall impact on heritage resources is Low. Provided that the recommended mitigation measures are implemented, the impact would be acceptably Low or could be totally mitigated to the degree that the project could be approved from a heritage perspective. The management and mitigation measures as described in Section 6 of this report have been developed to minimise the project impact on heritage resources.

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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; and
- 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 3 300 000 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 Iron Age

The archaeology of the period between 900-1300AD, associated with the development of the Zimbabwe culture, defined by class distinction and sacred leadership.

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.

Table 1 – List of abbreviations used in this report

Abbreviations	Description
AIA	Archaeological Impact Assessment
APHP	Association of Professional Heritage Practitioners
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EIAs practitioner	Environmental Impact Assessment Practitioner
ESA	Earlier Stone Age
GAE	GA Environmental (Pty) Ltd
GN	Government Notice
GPS	Global Positioning System
HIA	Heritage Impact Assessment
IAIASA	International Association for Impact Assessment South Africa
I&AP	Interested & Affected Party
LIA	Late Iron Age
LSA	Late Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)
NCW	Not Conservation Worthy
PDA	Palaeontological Desktop Assessment
PGS	PGS Heritage (Pty) Ltd
PHRA	Provincial Heritage Resources Authority
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

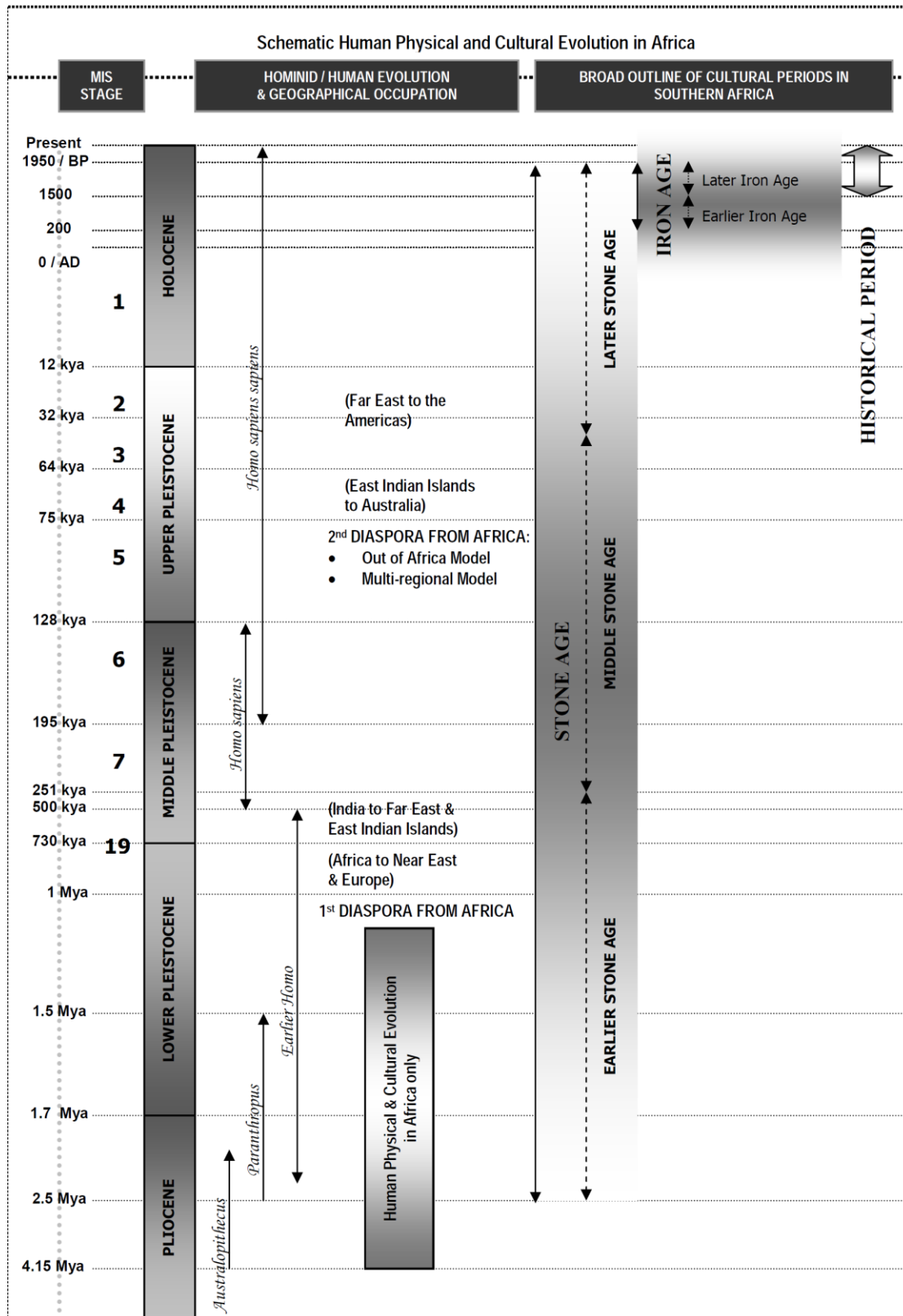


Figure 1 – Human and Cultural Timeline in Africa

1 INTRODUCTION

PGS was appointed by GSW to undertake an HIA which will serve to inform the EIA and EMPr for the proposed Mooiplaats Colliery Expansion, Gert Sibande District Municipality, Mpumalanga Province.

This report focusses on the four (4) areas proposed for the drilling of four (4) rescue bay boreholes and their associated access roads.

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 development area. The HIA aims to inform the EIA in the development of a comprehensive EMPr to assist the project applicant in responsibly managing the identified heritage resources in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act (Act 25 of 1999) (NHRA).

1.2 SPECIALIST QUALIFICATIONS

This HIA was compiled by PGS.

The staff at PGS have a combined experience of nearly 90 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).

Cherene de Bruyn author of this report is registered with the ASAPA as a Professional Archaeologist and is accredited as a Principal Investigator and Field Director, she is further also a member of the International Association for Impact Assessment South Africa (IAIASA). She holds a MA in Archaeology, BSc (Hons) in Physical Anthropology and a BA (Hons) in Archaeology.

Ruan van der Merwe, field archaeologist for this report is registered with the ASAPA as a Professional Archaeologist.

1.3 ASSUMPTIONS AND LIMITATIONS

Not detracting in any way from the comprehensiveness of the research undertaken, it is necessary to realise that the heritage resources located during the desktop research and fieldwork do not necessarily represent all the possible heritage resources present within the area.

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.

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:

- Notice 648 of the Government Gazette 45421- general requirements for undertaking an initial site sensitivity verification where no specific assessment protocol has been identified
- National Environmental Management Act (NEMA), Act 107 of 1998 – Appendix 6
- National Heritage Resources Act (NHRA), Act 25 of 1999

1.4.1 NOTICE 648 OF THE GOVERNMENT GAZETTE 45421

Although minimum standards for archaeological (2007) and palaeontological (2012) assessments were published by SAHRA, GN.648 requires sensitivity verification for a site selected on the national web-based environmental screening tool for which no specific assessment protocol related to any theme has been identified. The requirements for this Government Notice (GN) are listed in **Table 2** and the applicable section in this report noted.

Table 2 - Reporting requirements for GN648

GN 648	Relevant section in report	Where not applicable in this report
2.2 (a) a desktop analysis, using satellite imagery;	section 4.3	
2.2 (b) a preliminary on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web-based environmental screening tool, such as new developments, infrastructure, indigenous/pristine vegetation, etc.	4.1	-
2.3(a) confirms or disputes the current use of the land and environmental sensitivity as identified by the national web-based environmental screening tool;	section 4.1	-
2.3(b) contains motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity;	section 4.1	-

1.4.2 NEMA – APPENDIX 6 REQUIREMENTS

The HIA report has been compiled considering the NEMA Appendix 6 requirements for specialist reports as indicated in the table below. For ease of reference, the table below provides cross-references to the report sections where these requirements have been addressed. It is important to note, that where something is not applicable to this HIA, this has been indicated in the table below.

Table 3 - Reporting requirements as per NEMA Appendix 6 for specialist reports

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Relevant section in report	Comment where not applicable.
1.(1) (a) (i) Details of the specialist who prepared the report	Page 2 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 B	-
(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 2.1	-
(cA) An indication of the quality and age of base data used for the specialist report	Section 3	-
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 6	-
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3	-
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3	-
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 5	
(g) An identification of any areas to be avoided, including buffers	Section 4.6	
(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;	Figure 2 and Figure 3	
(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 8	
(k) Any mitigation measures for inclusion in the EMPr	Section 7.11	
(l) Any conditions for inclusion in the environmental authorisation		None required
(m) Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 7.11	

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Relevant section in report	Comment where not applicable.
(n)(i) A reasoned opinion as to whether the proposed activity, activities or portions thereof should be authorised and	Section 8	
(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 EMP, and where applicable, the closure plan	Section 8	-
(o) A description of any consultation process that was undertaken during the course of carrying out the study		Not applicable. A public consultation process was handled as part of the EIA and EMP process.
(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.	NEMA Appendix 6 and GN648	

1.4.3 THE NATIONAL HERITAGE RESOURCES ACT

- NHRA Act 25 of 1999
 - Protection of Heritage Resources – Sections 34 to 36; and
 - Heritage Resources Management – Section 38

The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA. This study falls under s38(8) and requires comment from the relevant heritage resources authority.

2 SITE LOCATION AND DESCRIPTION

2.1 LOCALITY AND SITE DESCRIPTION (PROVIDED BY GSW)

The Mooiplaats Colliery is located approximately 18km outside of the town of Ermelo, between the N2 and N11, and lies to the south of the Eskom Camden Power Station which falls within the municipal boundaries of the Gert Sibande District Municipality, Mpumalanga Province.

Study Coordinates	Area 1 S 26.639097° E 30.104320°	Area 2 S 26.636245° E 30.096955°
	Area 3 S 26.642073° E 30.112948°	Area 4 S 26.656042° E 30.121853°
Location	The study area is located within the Msukaligwa Local Municipality, in the Sibande District Municipality, Mpumalanga Province	
Property	Portions of Mooiplaats 290 IT	
Topographic Map	2630CA Camden	

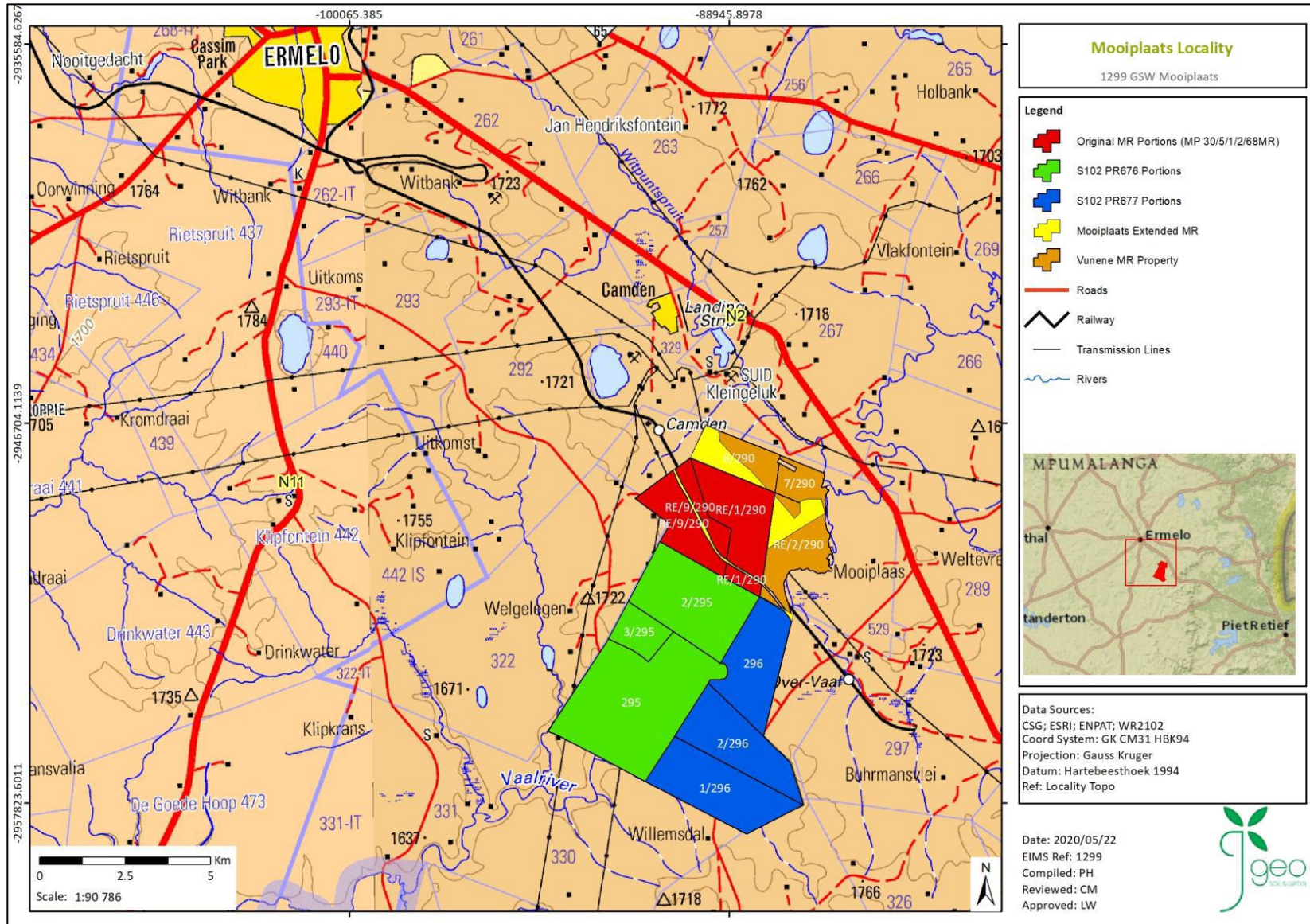


Figure 2 – Locality map of the proposed Mooiplaats Colliery Expansion Project (Provided by GSW)



Locality Map



Figure 3 - Locality map showing the location of the four boreholes

2.2 PROJECT DESCRIPTION (PROVIDED BY GEO SOIL AND WATER CC)

The proposed Mooiplaats Colliery project area will require two ventilation shafts and access roads, as well as additional rescue borehole with associated access roads.

This report focusses on the four (4) areas proposed for the drilling of four (4) rescue bay bore holes and their associated access roads.

3 METHODOLOGY

The applicable maps, tables and figures, are included as stipulated in the NHRA (no 25 of 1999), the NEMA (no 107 of 1998). The HIA process consisted of three steps:

Step I – Literature Review and sensitivity analysis¹: The background information to the field survey relies greatly on previous studies completed for the project to determine known sensitivities, as well as the heritage background research completed for this report.

Step II – Physical Survey: A physical survey was conducted by vehicle through the proposed project area by a qualified heritage specialist. The survey was conducted between 15 September 2020, aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.

Step III – The final step involved the recording and documentation of relevant archaeological resources, the assessment of resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

3.1 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 4** and **Table 5**).

Table 4 - 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		

¹ According to Notice 648 of the Government Gazette 45421

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
	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 5 - 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	High Significance

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
		should receive maximum protection at local level.	
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 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

4 CURRENT STATUS QUO

4.1 SITE DESCRIPTION

4.1.1 GENERAL SITE:

The study area is situated approximately 16km south-east of Ermelo along the N2 towards Piet Retief. The various target areas are scattered within the open fields surrounding the Mooiplaats Colliery. The site is also within 3 km south of the Camden power station. The surrounding land uses around the Mooiplaats Colliery is mainly agriculture, including grazing, pasture and fodder production. A railway line runs through the mining right boundary of the Mooiplaats Colliery and the N2 highway runs on the north and western side of the Mooiplaats Colliery, while the N11 lies on the eastern side.

Access to the various target areas was gained via the main entrance road running from the N2 into the Mooiplaats Colliery. Visibility across the entire study area was fairly high due to the open fields around the mine being used primarily for the grazing of livestock.

4.1.2 TARGET AREAS:

- Area 1:

Area 1 is situated along a small drainage stream next to a small fence line. The surrounding area is a large open field with grazing livestock present. The area is mostly flat with high surface visibility. The small stream seems to have some kind of mineral deposit collecting on the surface. The immediate area around the stream has been fairly trampled by livestock causing a high amount of surface disturbance.

- Area 2:

Area 2 is situated further north along the same fence line as Area 1. This area is higher up on a small ridgeline. The entire area is still however fairly flat and open. The visibility was fairly high with no tall-growing vegetation present. The landscape seems to have been used for agricultural purposes due to the lack of any trees. This area is mainly used as grazing for the local livestock.

Area 1 and 2 are situated fairly close to the Camden power station, with multiple large powerlines running across the study area in the direction of the power station.

- Area 3:

Area 3 is situated right next to the main access road into the Mooiplaats Colliery. The proposed line runs from the road and across an existing fence as well as a pipeline into the open fields next to the road. This area is also largely open and flat with grazing livestock present. This area seems fairly disturbed due to the fact that the proposed line is situated close to the road reserve area.

- Area 4:

Area 4 is situated in an open field about 2 km south-east of the Mooiplaats Colliery. Access to this site was gained using the gravel roads between the various fields. This area is again largely flat and open and is situated on an existing fence. A fairly recent trench has been dug along this fence line causing some disturbance in terms of ground visibility. Overall visibility on the site was high due to the use of these fields for the grazing of livestock.



Figure 4 – General view of Area 1



Figure 5 - General view of Area 2



Figure 6 - View of the Camden Power Station located close to Area 1 and Area 2



Figure 7 – General view of Area 3



Figure 8 – General view of Area 4

4.2 ARCHAEOLOGICAL BACKGROUND TO THE STUDY AREA AND SURROUNDINGS

DATE	DESCRIPTION
2.5 million to 250 000 years ago	<p>The Earlier Stone Age (ESA) is the first and oldest phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these technological phases is known as Oldowan and is associated with crude flakes and hammerstones which date to approximately 2 million years ago. The second technological phase in the Earlier Stone Age of Southern Africa is known as the Acheulian and comprises more refined and better-made stone artefacts such as the cleaver and bifacial handaxe. The Acheulian phase dates back to approximately 1.5 million years ago.</p> <p><i>No ESA sites are known from the immediate vicinity of the footprint area.</i></p>
250,000 to 40,000 years ago	<p>The Middle Stone Age 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.</p> <p><i>No MSA sites are known from the immediate vicinity of the footprint area.</i></p>
40,000 years ago to the historic past	<p>The Later Stone Age is the third phase identified in South Africa's Stone Age history. This phase in human history is associated with an abundance of very small stone artefacts or microliths. Archaeologists have investigated some of the old shelters in the present-day areas of Witbank, Ermelo, Barberton, Nelspruit, White River, Lydenburg, and Ohrigstad. (Delius and Hay, 2009).</p> <p><i>No LSA sites are known from the immediate vicinity of the footprint area</i></p>
AD 200 – AD 900	<p>The earliest phase in the Iron Age history of Southern African is known as the Early Iron Age.</p> <p><i>No EIA sites are known from the immediate vicinity of the footprint area</i></p>
AD 900 – AD 1300	<p>The second phase in the Iron Age history of Southern Africa is known as the Middle Iron Age. Evidence from Welgelegen Shelter on the banks of the Vaal River near Ermelo, suggests early farming and hunter-gatherer communities coexisted. Layers dating to AD 1200 provide evidence that the farmers with metal tools occupied the shelter, while what appears to be a dependent hunter-gatherer group, making typical LSA tools, and using pottery but no iron tools, occupied the less desirable overhang area. (Esterhuysen and Smith, 2007)</p>
AD 1300 – AD 1850	<p>The third and final phase in the Iron Age history of Southern Africa is known as the Late Iron Age. Bergh (1999) identifies two main Late Iron Age groups within the wider vicinity of the Ermelo area, namely the Phuthing and the Khumalo Ndebele (Matabele).</p> <p>Furthermore, Lombard (1980) states that corbelled stone huts (which are also associated with the Late Iron Age) are found on the farms Tafelkop 270 and Middelpmaat 271. These farms are located some 14 kilometres north-west of the present study area. According to Huffmann (2007), corbelled stone huts appear to be associated with the so-called Type V Iron Age sites. These Type V settlements date from the period 1700 to 1850.</p> <p>Lombard (1980) also mentions a Late Iron Age group he refers to as the Nhlapo people and indicates that when the first white people came to stay in the Ermelo district they already found the Nhlapo people in the vicinity of Maviristad. Myburgh (1956) also refers to the followers of George Nhlapo, who resided on the farm Witbank in the Ermelo district.</p>
1821	<p>In this year the Matabele of Mzilikazi moved out of present-day KwaZulu Natal and encountered the Phuthing along the upper reaches of the Vaal and Olifants Rivers. This area was located north-west of present-day Ermelo, roughly between this town and Hendrina. After the Phuthing were attacked and</p>

DATE	DESCRIPTION
	defeated by the Matabele, they were forced to flee in a southern direction over the Vaal River. In turn, the Matabele moved to the banks of the Vaal River where they established themselves between 1823 and 1827 (Bergh, 1999).
The early 1860s	During the early 1860s, the first Voortrekker families started establishing themselves in the present-day Ermelo area. Some of these early white residents include Hendrik Teodor Bührmann, Nicolaas Jacobus Breytenbach and F.P. van Rhede van Oudtshoorn (Lombard, 1980).
12 February 1880	The town of Ermelo was officially proclaimed on this day by the Administrator of the Transvaal, William Owen Lanyon (Lombard, 1980).
26 October 1882	The District of Ermelo was officially proclaimed on this day (Bergh, 1999).
1899 – 1902	<p>Although no evidence for battles or skirmishes within or in the direct vicinity of the study area during the South African War could be found, Van der Westhuizen (2000) refers to the fact that the hill known as Bührmannstafelkop was used by the British as a military hospital during the war. The hill is located approximately 3 km north by north-east of the study area.</p> <p>The closest known battle of the South African War took place at the farm Onverwacht, on a ridge of the Bankkop Hills, about 30km east of Ermelo. The battle took place on 4 January 1902. During the previous month, eight British columns under the leadership of Major General Bruce Hamilton had been searching for General Louis Botha who was known to be in the area with a force of about 700 men. A couple of incidents in the days preceding 4 January gave the British a clear indication that Botha's force might be hiding in the Bankkop hills. In the morning of 4 January, General Botha told his generals Brits, Opperman and Chris Botha that he had received information that the advance guard of a British column was approaching. His generals advocated a strike against the enemy. Brits planned the attack and the placing of the commandos. They were from Wakkerstroom, Swaziland, Standerton and Ermelo. The Boer forces were hidden in various kloofs and ravines around the ridge and a decoy was arranged, with a few Boers driving some cattle over the ridge, within sight of the British forces. When some of the British advance guard followed the Boer decoy over the ridge, the rest of the Boers opened fire and emerged from the ravine where they had been hiding. The Boers heavily outnumbered the members of the advance guard and managed to isolate a small group on a spur of the ridge. However, the British managed to send a galloper to summon the two main British columns. General Opperman was killed during the action and the young burgher who was in charge of Louis Botha's young son was fatally wounded. By the end of the assault the Boers had captured thirty unwounded horses, but very few rifles and little ammunition. Boer casualties were heavy and almost certainly more than the 23 killed on the British side. By the time the advance element of the main British column arrived the Boers had retreated and scattered in all directions. Onverwacht was the last aggressive action of Botha's commando in the eastern Transvaal. (Smith, 2004).</p>
1914	The Bellevue coal mine was opened in this year. On 7 July 1916 the Bellevue Colliers Company Limited was registered (Lombard, 1980). The mine is approximately 1.3 km north-west of the study area.

4.3 PREVIOUS ARCHAEOLOGICAL AND HERITAGE STUDIES IN AND AROUND THE STUDY AREA

A scan of the SAHRIS database has revealed the following studies conducted in and around the study area of this report. These studies are summarised below in ascending date order:

- **Van Schalkwyk, L. 2006. Heritage impact assessment of n11 borrow pits, Ermelo to Amersfoort, Mpumalanga Province, South Africa.** No heritage resources of significance were identified.
- **Pistorius, J. C. C. 2007. A Phase 1 Heritage Impact Assessment Study for the Proposed New 88 kV Power Line Running from the Majuba Power Station near Amersfoort to the Camden Power Station near Ermelo in the Mpumalanga Province.** During the survey, two (2) homesteads for farmworkers as well as a cemetery were identified.
- **Birkholtz, P. 2008. Phase 1 Heritage Impact Assessment for the Lothier Siding for Golfview Mining (Pty) Ltd. on the Farm Leliefontein 136 IT Portion 6 in the Vicinity of Ermelo, Mpumalanga Province, South Africa.** No heritage sites were located inside the proposed development area.
- **Fourie, W. 2008. Archaeological Impact Assessment for the proposed mining development for Xstrata Group Spitzkop Mine, Breyten – Ermelo Region, Mpumalanga Province.** Three cemeteries consisting of approximately 77 graves were identified.
- **Fourie, W. 2008. Archaeological Impact Assessment Camden Power Station Rail expansion project on portions of the farm Mooiplaats 290 IT and the farm Camden Power Station 329 IT, District Ermelo, Mpumalanga.** During the survey one site (remains of a stone ruin) of low heritage, significance was identified.
- **Fourie, W. 2009. Heritage Impact Assessment for the Spitzkop Colliery, District Ermelo, Mpumalanga.** During the survey, seventy-five (75) sites were identified, including forty-four (44) cemeteries, twenty-five (25) farmsteads, one (1) archaeological site, and five (5) farmworkers housing.
- **Birkholtz, P. 2010. Phase 1 Heritage Impact Assessment proposed the establishment of the Van Ouds Colliery On Portions 20, 23, 32 And 51 of the farm Van Oudshoornstroom 261-It, in the vicinity of Ermelo, Mpumalanga Province.** No sites were located within the study area.
- **van Vollenhoven, A. 2012. A report on a heritage impact assessment for a proposed Opencast Coal Mine On The Farms Joubertsvlei 260 It and Meppel 264 It, close to Ermelo, Mpumalanga Province.** The fieldwork undertaken revealed eighteen (18) sites of cultural heritage significance, including a farmhouse, a farmyard, and sixteen (16) burial grounds and gravesites.
- **Magoma, M. 2013. Phase 1 archaeological impact assessment specialist study report for the proposed township establishment of 5760 Stands on Portion 6 of Farm Rietspruit 437- is in Ermelo Region within Msukaligwa Local Municipality of Gert Sibande District, Mpumalanga Province.** Several contemporary farm dwellings, cement foundations and five burial sites were recorded.
- **Kitto, J. 2013. Heritage Impact Assessment for the proposed expansion of mining activities on Portion 25 of the Farm Witbank No 262 It, Ferreira's Extension of Penumbra Mine, near Ermelo, Gert Sibande District Municipality, Mpumalanga Province.** The fieldwork identified four cultural-heritage sites, including three grave/cemetery sites.

- **Hardwick, S. & du Piesanie, J. 2019. Heritage Impact Assessment for the Integrated Environmental Authorisation Process for the Proposed Dagsoom Twyfelaar Coal Mining Project near Ermelo, Mpumalanga.** Twenty-seven (27) heritage resources were identified, including thirteen (13) burial grounds and graves, a historical site, three (3) historical artefacts and eleven (11) and the structural remains of the historic built environment.
- **Richard, M. 2019. Phase 1 heritage impact assessment report for the proposed construction of New Ermelo Primary School On Erf 9248 Ermelo Extension 34 in Ermelo, Msukaligwa Local Municipality Of Mpumalanga Province.** One isolated grave marked by a stone cairn was identified.
- **Antonites, X. 2020. Heritage impact assessment report: proposed stone mining and crushers on Portion 15 of Rietspruit 437 IS, Ermelo, Mpumalanga Province.** An informal burial ground was recorded approximately 25m outside the project.

4.4 ARCHIVAL/HISTORICAL MAPS

The examination of historical data and cartographic resources represents a critical tool for locating and identifying heritage resources and in determining the historical and cultural context of the study area. Relevant topographic maps and satellite imagery were studied to identify structures, possible burial grounds or archaeological sites present in the footprint area.

Topographic maps (1:50 000) for various years (1968 and 1985) were assessed to observe the development of the area, as well as the location of possible historical structures and burial grounds. The maps were also used to assess the possible age of structures located, to determine whether they could be considered as heritage sites. Map overlays were created showing the possible heritage sites identified within the areas of concern, as can be seen below (**Figure 9** and **Figure 10**).

The relevant topographical maps include:

- First Edition 2630CA Camden Topographic Sheet, surveyed in 1968 and drawn in 1970 by the Trigonometrical Survey Office. Published by the Government Printer in 1970.
- Second Edition 2630CA Camden Topographic Sheet, published by the Chief Director of Surveys and Mapping in 1985, and printed by the Government Printer.

It can be seen that all the map sheets consulted depict the entire project area surrounded by several structures as well as railway lines.

4.5 FINDINGS OF THE HISTORICAL DESKTOP STUDY

The findings can be compiled as follows and have been combined to produce a heritage sensitivity map for the project based on the desktop assessment (**Figure 9** and **Figure 10**).

4.5.1 HERITAGE SCREENING

A Heritage Screening Report was compiled by the Department of Environmental Affairs National Web-based Environmental Screening Tool as required by Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended (**Figure 11**). According to the Heritage screening report, the directly affected area has a Medium heritage sensitivity.

4.5.2 HERITAGE SENSITIVITY

The sensitivity maps were produced by overlying:

- Satellite Imagery;
- Current Topographical Maps; and
- First edition Topographical Maps dating to 1968-70.

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

- Dwellings;
- Clusters of dwellings (homesteads, huts and farmsteads);
- Archaeological Sensitive areas; and
- 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 6**.

Table 6 -Tangible heritage sites in the study area

Name	Description	Legislative protection
Archaeology - Iron Age Sites	Older than 100 years	NHRA Sect 3 and 35
Architectural Structures	Possibly older than 60 years	NHRA Sect 3 and 34
Graves and Burial Grounds	60 years or older	NHRA Sect 3 and 36

Additionally, evaluation of satellite imagery has indicated the following areas that may be sensitive from a heritage perspective. The analysis of the studies conducted in the area assisted in the development of the following landform type to heritage find matrix in **Table 7**.

Table 7 - Landform type to heritage find matrix

LANDFORM TYPE	HERITAGE TYPE
Crest and foot hill	LSA and MSA scatters, LIA settlements
Crest of small hills	Small LSA sites – scatters of stone artefacts, ostrich eggshell, pottery and beads
Watering holes/pans/rivers	ESA, MSA and LSA sites, LIA settlements
Farmsteads	Historical archaeological material
Ridges and drainage lines	LSA sites, LIA settlements
Forested areas	LIA sites

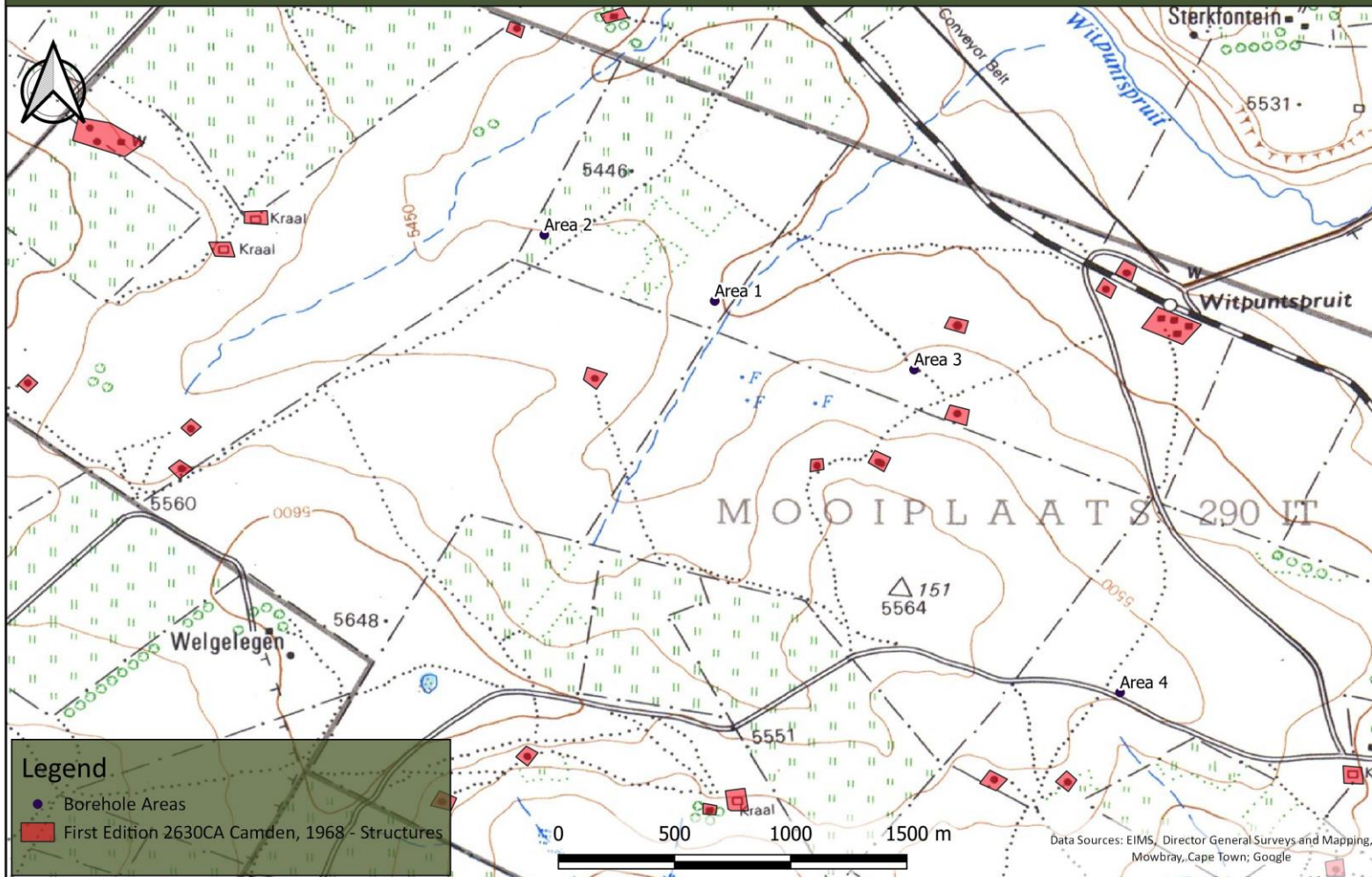


Figure 9 - First Edition 2630CA Camden Topographic Sheet dating to 1968 showing the four borehole areas (purple points), with several heritage features (red polygons) located in close proximity to the project area

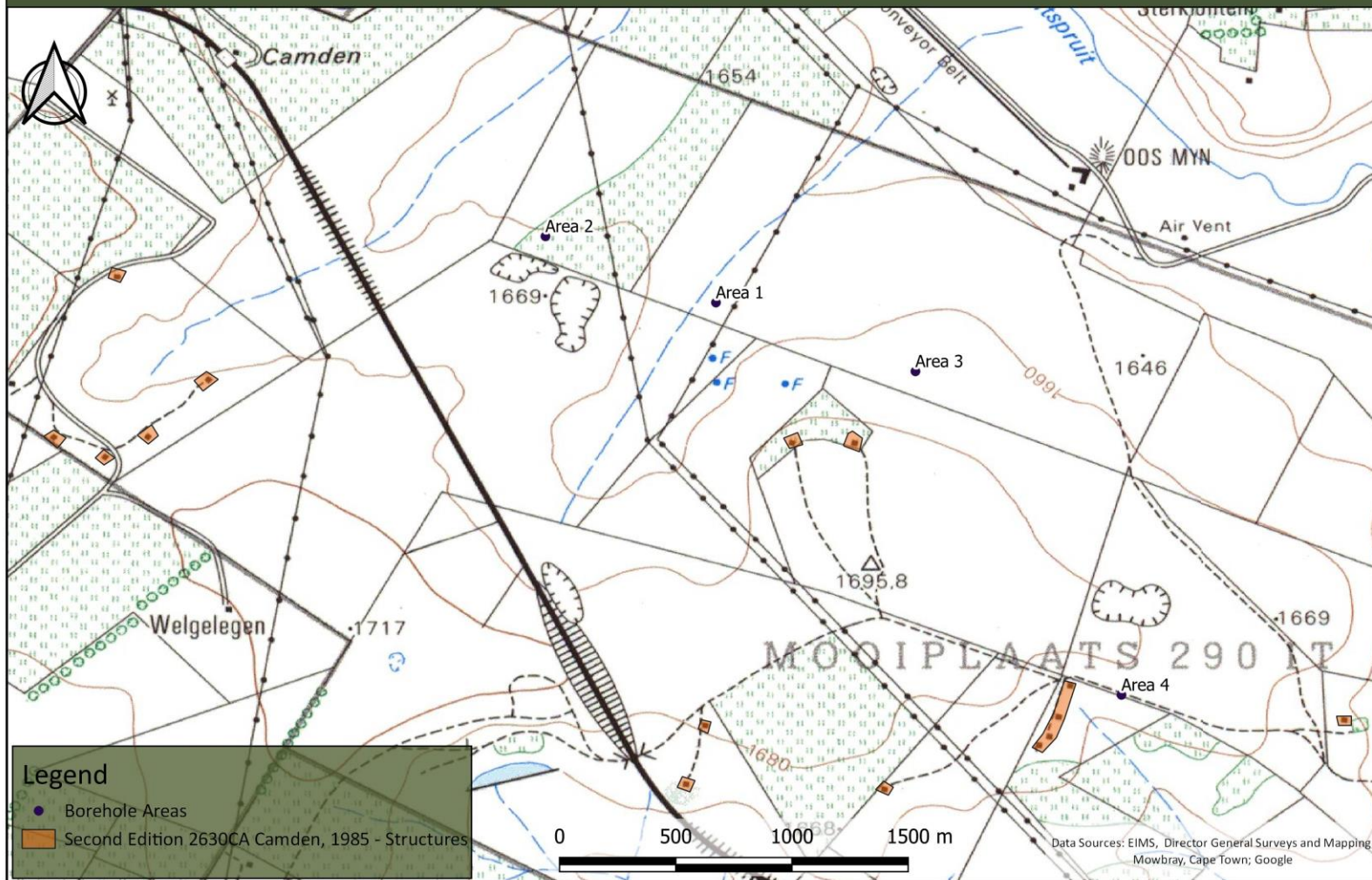


Figure 10 - First Edition 2630CA Camden Topographic Sheet dating to 1985 showing the four borehole areas (purple points), with several heritage features (orange polygons) located in close proximity to the project area.

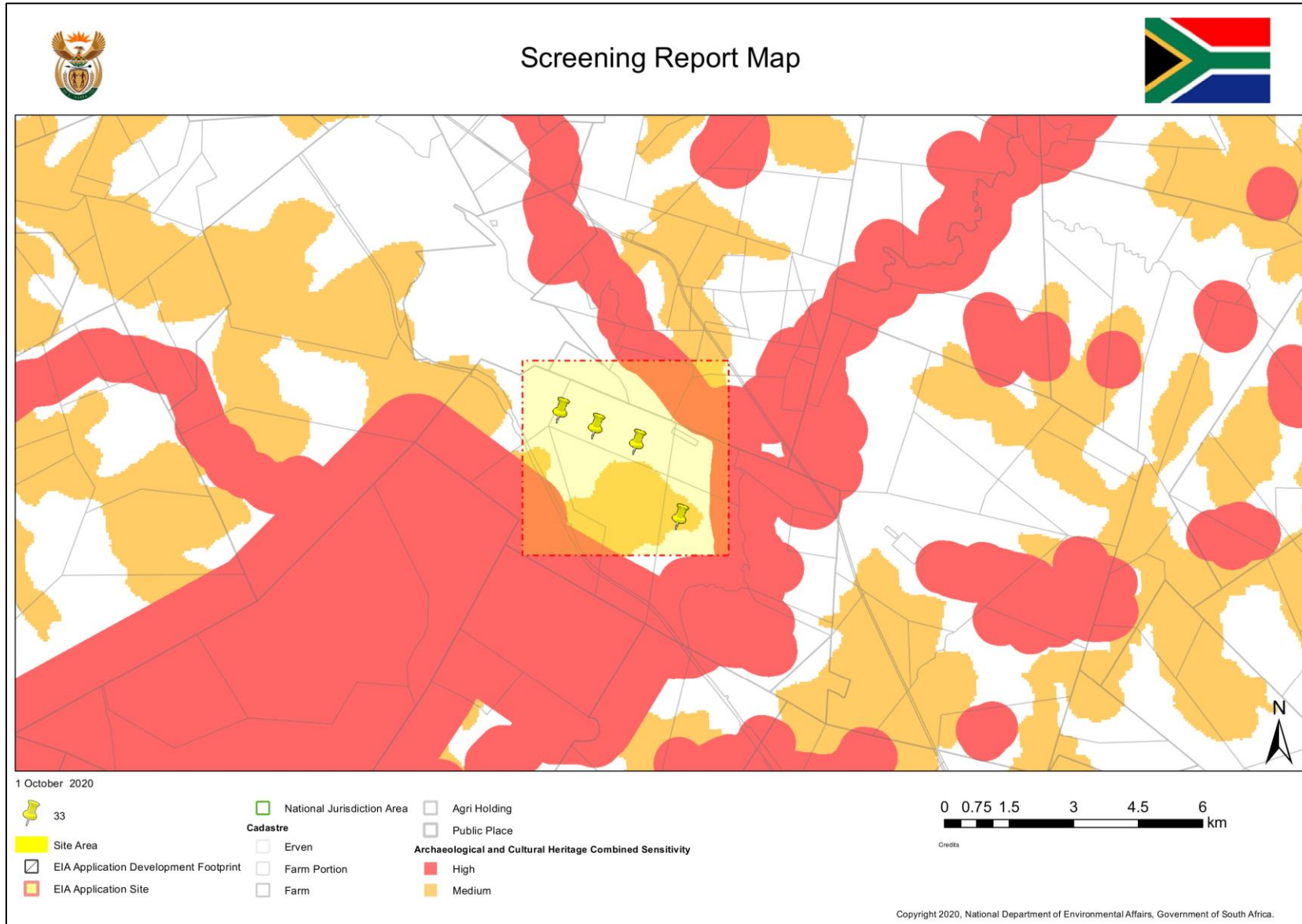


Figure 11 - Heritage Screening map. Source: Department of Environmental Affairs

5 FIELDWORK AND FINDINGS

A controlled surface survey was conducted on foot and by a vehicle by an archaeologist from PGS. The fieldwork was conducted on 15 September 2020. During the fieldwork, hand-held GPS devices were used to record tracklogs. These recorded track logs show the routes followed by the fieldwork team on site. The tracklogs (in yellow) for the survey are indicated in **Figure 12**.

Despite the intensive fieldwork was undertaken, no evidence for any archaeological or heritage sites could be identified within the study area.

5.1 SENSITIVITY ASSESSMENT OUTCOME

From the desktop assessment moderate to low heritage sensitive areas were identified. Many of the heritage sensitive areas identified during the desktop search consisted of old structures and buildings that fall outside the study area.

No other heritage sites were identified during the survey of the project area.



Figure 12 - Fieldwork tracklogs

6 PALAEOLOGY

According to the Palaeontological Desktop assessment (PDA) the proposed development is underlain by the by Karoo Dolerite and Vryheid Formation (Ecca Group; Karoo Supergroup) (Butler, 2020)(**Figure 13**).

According to the PalaeoMap of South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of Karoo Dolerite (malific intrusions) is insignificant while the Palaeontological Sensitivity of the Vryheid Formation is Very High.

As can be seen in **Figure 14**, the proposed four boreholes occurs in an area where the palaeontology is assessed as being of Insignificant (grey) palaeosensitivity. As such no palaeontological studies are required however a protocol for finds is required.

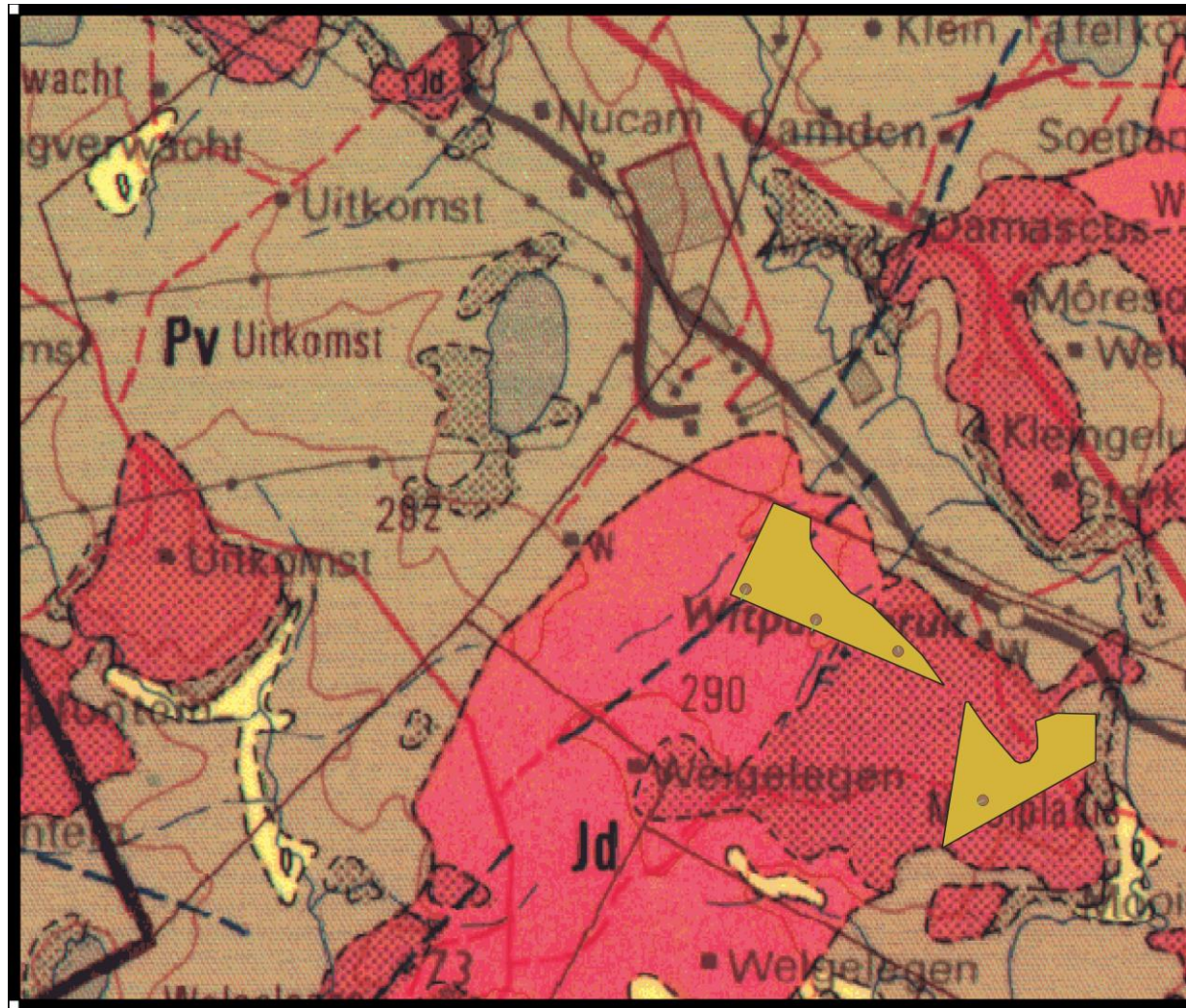
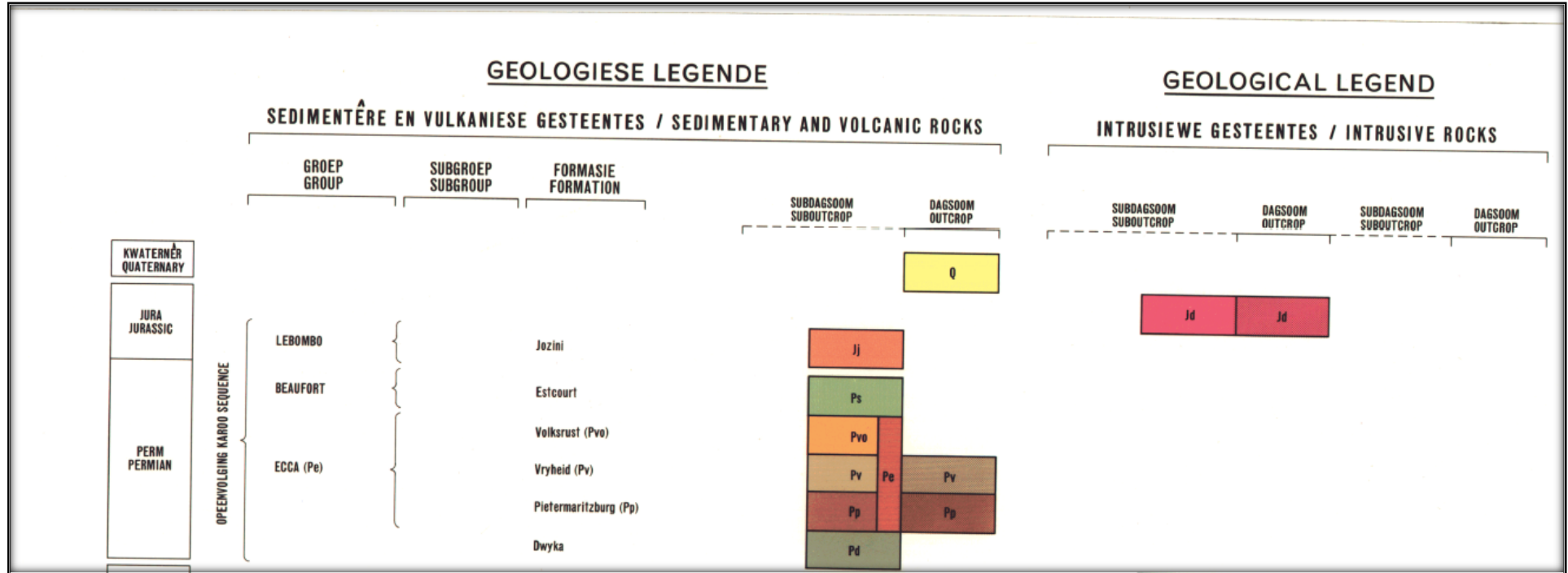


Figure 13 - Extract of the 2630 Mbabane Map (Council of Geoscience) indicating the surface geology of the Mooiplaats Colliery Extension in Mpumalanga. The proposed development is mainly underlain by the Jurassic intrusive rocks as well as a small portion of Vryheid Fm (Ecca Group; Karoo Supergroup).



Legend

Jd- Jurassic Dolerite-Igneous rocks

Pv-Vryheid Formation (Ecca Group; Karoo Supergroup), sandstone, gritt and coal seam

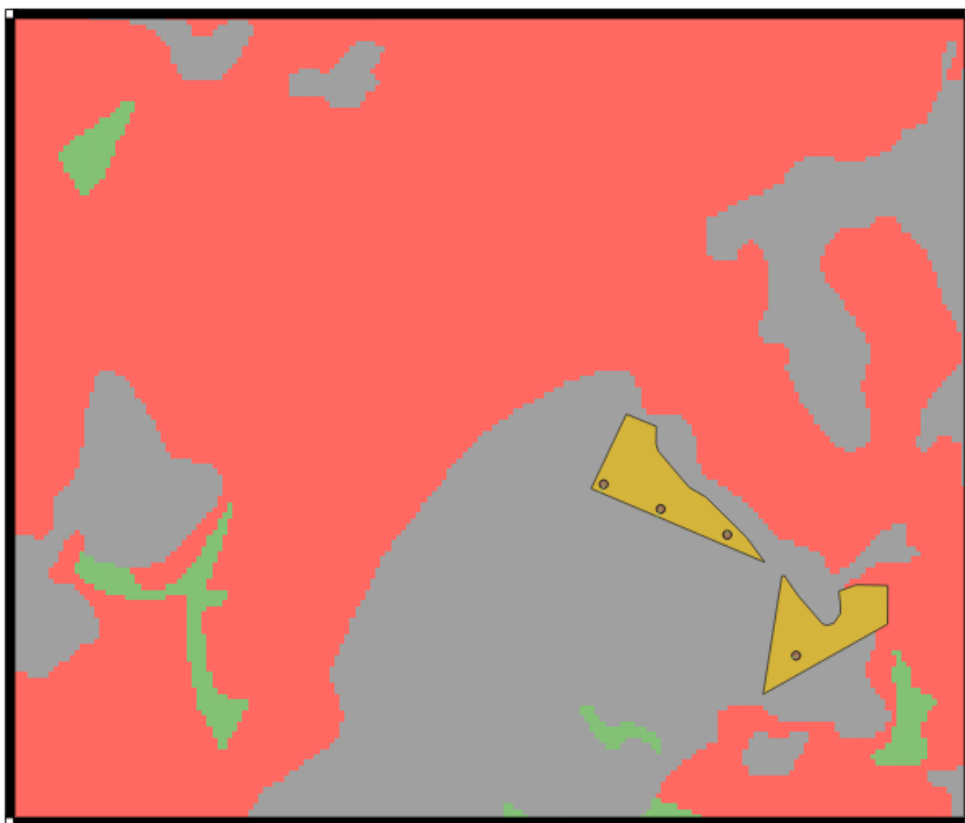


Figure 14 - Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences) indicating the proposed development in green.

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

According to the SAHRIS Palaeo Sensitivity map (**Figure 14**) there is a very high chance of finding fossils in this area (the red colour indicates Very High palaeontological sensitivity).

7 IMPACT ASSESSMENT

The impact significance rating methodology, as provided by GSW, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. This determines the environmental risk. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S). The impact assessment will be applied to all identified alternatives. Where possible, mitigation measures will be recommended for the impacts identified.

7.1 DETERMINATION OF ENVIRONMENTAL RISK

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. The consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and reversibility (R) applicable to the specific impact.

For the purpose of this methodology, the consequence of the impact is represented by:

$$C = \frac{(E+D+M+R) \times N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in **Table 8** below.

Table 8 - Criteria for Determining Impact Consequence

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site)
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years),
	3	Medium term (6-15 years),
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).

Aspect	Score	Definition
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way),
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact

Once the C has been determined, the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Error! Reference source not found.9.

Table 9 - Probability Scoring

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur)

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$ER = C \times P$$

Table 10 - Determination of Environmental Risk

Cons	5	5	10	15	20	25
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	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
	0	1	2	3	4	5
	Probability					

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in **Table 11**.

Table 11 - Significance Classes

Environmental Risk Score	
Value	Description
< 9	Low (i.e. where this impact is unlikely to be a significant environmental risk).
≥9 - <17	Medium (i.e. where the impact could have a significant environmental risk),
≥17	High (i.e. where the impact will have a significant environmental risk).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post-implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

7.2 IMPACT PRIORITISATION

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 12 - Criteria for Determining Prioritisation

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely
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		that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable Loss of Resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 5. The impact priority is therefore determined as follows:

$$\text{Priority} = \text{CI} + \text{LR}$$

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 2 (Refer to **Table 13**).

Table 13 - Determination of Prioritisation Factor

Priority	Ranking	Prioritisation Factor
2	Low	1
3	Medium	1.125
4	Medium	1.25
5	Medium	1.375
6	High	1.5

In order to determine the final impact significance, the PF is multiplied by the ER of the post-mitigation scoring. The ultimate aim of the PF is an attempt to increase the post-mitigation environmental risk rating by a full ranking class if all the priority attributes are high (i.e. if an impact comes out with a medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 14 - Final Environmental Significance Rating

Environmental Significance Rating	
Value	Description
≤ -20	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
> -20 ≤ -10	Medium negative (i.e. where the impact could influence the decision to develop in the area).
> -10	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
0	No impact
<10	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥ 10 < 20	Medium positive (i.e. where the impact could influence the decision to develop in the area).
≥ 20	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

7.3 HERITAGE IMPACTS

Despite an intensive walkthrough of the footprint area, no evidence for any archaeological or heritage sites could be identified. As a result, no impact is expected from the proposed development on heritage. Refer to **Table 15**.

7.4 PALAEOLOGICAL IMPACTS

According to the PDA the proposed development is underlain by the by Karoo Dolerite and Vryheid Formation (Ecca Group; Karoo Supergroup). According to the SAHRIS PalaeoMap the Palaeontological Sensitivity of Karoo Dolerite (malific intrusions) is insignificant while the Palaeontological Sensitivity of the Vryheid Formation is Very High.

A Very High palaeontological sensitivity has been allocated to the Vryheid Formation. The expected duration of the impact is assessed as potentially permanent to long term. *Only the study site will be affected by the proposed development.* In the absence of mitigation procedures (should fossil material be present within the affected area) the damage or destruction of any palaeontological materials will be permanent. The possibility of the impact occurring **is very likely**. Impacts on palaeontological heritage during the construction phase could potentially occur but are regarded as having a moderate possibility.

Table 15 - Impact rating for heritage resources

IMPACT DESCRIPTION				Pre-Mitigation						Post Mitigation						Priority Factor Criteria						
Identifier	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
7.3 Heritage resources	Damage/destruction of unidentified heritage finds	Alternative 1	Planning	-1	1	5	1	5	1	-3	-1	1	4	2	4	2	-5,5	High	2	3	1,38	-7,56
	Damage/destruction of unidentified heritage finds	Alternative 1	Construction	-1	1	5	1	5	1	-3	-1	1	4	2	4	2	-5,5	High	2	3	1,38	-7,56
	Damage/destruction of unidentified heritage finds	Alternative 1	Operation	-1	1	5	1	5	1	-3	-1	1	4	2	4	2	-5,5	High	2	3	1,38	-7,56
	Damage/destruction of unidentified heritage finds	Alternative 1	Decommissioning	-1	1	5	1	5	1	-3	-1	1	4	2	4	2	-5,5	High	2	3	1,38	-7,56
	Damage/destruction of unidentified heritage finds	Alternative 1	Rehab and closure	-1	1	5	1	5	1	-3	-1	1	4	2	4	2	-5,5	High	2	3	1,38	-7,56
7.4 Palaeontology	Damage/destruction of possible finds	Alternative 1	Planning	-1	1	5	1	5	1	-3	-1	1	3	3	3	2	-5	High	2	2	1,25	-6,25
	Damage/destruction of possible finds	Alternative 1	Construction	-1	1	5	5	5	3	-12	-1	1	5	2	5	2	-6,5	High	2	2	1,25	-8,13
	Damage/destruction of possible finds	Alternative 1	Operation	-1	1	5	5	5	3	-12	-1	1	5	2	5	2	-6,5	High	2	2	1,25	-8,13
	Damage/destruction of possible finds	Alternative 1	Decommissioning	-1	1	5	5	5	3	-12	-1	1	5	2	5	2	-6,5	High	2	2	1,25	-8,13
	Damage/destruction of possible finds	Alternative 1	Rehab and closure	-1	1	5	5	5	3	-12	-1	1	5	2	5	2	-6,5	High	2	2	1,25	-8,13

7.5 MANAGEMENT RECOMMENDATIONS AND GUIDELINES

7.5.1 CONSTRUCTION PHASE

The project will encompass a range of activities during the construction phase, including ground clearance, the establishment of construction camp areas and small-scale infrastructure development associated with the project.

It is possible that cultural material will be exposed during construction and may be recoverable, keeping in mind delays can be costly during construction and as such must be minimised. Development surrounding infrastructure and construction of facilities results in significant disturbance, however, foundation holes do offer a window into the past and it thus may be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project and these must be catered for. Temporary infrastructure developments, such as construction camps and laydown areas, are often changed or added to the project as required. In general, these are low impact developments as they are superficial, resulting in a little alteration of the land surface, but still, need to be catered for.

During the construction phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. It is recommended that the following chance find procedure should be implemented.

7.5.2 CHANCE FIND PROCEDURE

- An appropriately qualified heritage practitioner/archaeologist must be identified to be called upon in the event that any possible heritage resources or artefacts are identified.
- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted.
- The qualified heritage practitioner/archaeologist will then need to come out to the site and evaluate the Heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource.
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered.
- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner/archaeologist.

7.5.3 POSSIBLE FINDS DURING CONSTRUCTION

The study area occurs within a greater historical and the archaeological site as identified during the desktop and fieldwork phase. Soil clearance for infrastructure as well as the proposed reclamation activities could uncover the following:

- High-density concentrations of a stone artefact
- unmarked graves

7.6 TIMEFRAMES

It must be kept in mind that mitigation and monitoring of heritage resources discovered during construction activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the construction time frames. **Table 16** gives guidelines for lead times on permitting.

Table 16 - Lead times for permitting and mobilisation

Action	Responsibility	Timeframe
Preparation for field monitoring and finalisation of contracts	The contractor and service provider	1 month
Application for permits to do necessary mitigation work	Service provider – Archaeologist and SAHRA	3 months
Documentation, excavation and archaeological report on the relevant site	Service provider – Archaeologist	3 months
Handling of chance finds – Graves/Human Remains	Service provider – Archaeologist and SAHRA	2 weeks
Relocation of burial grounds or graves in the way of construction	Service provider – Archaeologist, SAHRA, local government and provincial government	6 months

7.7 HERITAGE MANAGEMENT PLAN FOR EMPR IMPLEMENTATION

Table 17 - Heritage Management Plan for EMPr implementation

Area and site no.	Mitigation measures	Phase	Timeframe	The responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
General project area	Implement a chance to find procedures in case where possible heritage finds are uncovered.	Construction and operation	During construction and operation	Applicant ECO Heritage Specialist	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	ECO Monthly Checklist/Report
General project area gravs	Implement the Palaeontological chance finds protocol as required	Construction through to Operational	During Construction and Operation	Applicant Environmental Control Officer (ECO) Heritage specialist	Monthly	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report

8 CONCLUSIONS

PGS was appointed by GSW to undertake an HIA which will serve to inform the BAR and EMPr for the proposed Mooiplaats Colliery Expansion, Gert Sibande District Municipality, Mpumalanga Province.

This report focusses on the four (4) areas proposed for the drilling of four (4) rescue bay boreholes and their associated access roads.

Heritage resources are unique and non-renewable and as such, any impact on such resources must be seen as significant. The HIA has shown that the study area and surrounding area has some heritage resources situated within the proposed development boundaries. Through data analysis and a site investigation, the following issues were identified from a heritage perspective.

8.1 HERITAGE SITES

Intensive field surveys of the study area were undertaken on foot by comprising one field archaeologist on 15 September 2020. No archaeological sites or burial grounds and graves were identified during the fieldwork.

8.2 IMPACT ASSESSMENT

Despite an intensive walkthrough of the project area, no evidence for any archaeological or heritage sites could be identified. As a result, no impact is expected from the proposed development on heritage.

According to the PDA the proposed development is underlain by the by Karoo Dolerite and Vryheid Formation (Ecca Group; Karoo Supergroup). According to the SAHRIS PalaeoMap the Palaeontological Sensitivity of Karoo Dolerite (malific intrusions) is insignificant while the Palaeontological Sensitivity of the Vryheid Formation is Very High. Refer to Chapter 7.

8.3 MITIGATION MEASURES

With no impact expected on heritage, no further mitigation is required. Refer Chapter 8 of this report.

8.4 GENERAL

It is the author's considered opinion that the overall impact on heritage resources is Low. Provided that the recommended mitigation measures are implemented, the impact would be acceptably Low or could be totally mitigated to the degree that the project could be approved from a heritage perspective.

9 REFERENCES

9.1 PUBLISHED REFERENCES

- Bergh, J.S. (ed.). 1999: Geskiedenis Atlas van Suid-Afrika: Die Vier Noordelike Provinsies. J.L. van Schaik. Pretoria.
- Delius, P and Hay, M. 2009. Mpumalanga An Illustrated History. The Highveld Press Esterhuysen and Smith, 2007. The Archaeology of Mpumalanga In: Delius, P. (ed.) Mpumalanga: History and Heritage: 69-89. Pietermaritzburg: University of KwaZulu-Natal Press
- Lye, W.F. 1967. The Difaqane – the Mfecane in the Southern Sotho area, 1822 – 1824. Journal of African History 8 (1): 107-131.
- Goodwin H.J. & Van Riet Lowe, C. 1929. The Stone Age cultures of South Africa. Annals of the South African Museum 27: 1 – 289.
- Huffman, T., 2007. Handbook to the Iron Age of Pre-Colonial Farming Societies in South Africa. s.l.: University of KwaZulu-Natal Press.
- Lombard, R.T.J. 1980. Ermelo: 1880 - 1980. City Council of Ermelo, Ermelo.
- Maggs T. M. O'C 1976. Iron Age Communities of the Southern Highveld. Occasional Publications of the Natal Museum No. 2. Natal Museum, Pietermaritzburg.
- Morris, D. 2008. Archaeological and Heritage Phase 1, Impact Assessment for proposed upgrading of Sishen Mine Diesel Depot Storage Capacity at Kathu, Northern Cape. Kimberley: McGregor Museum.
- Myburgh, A.C., 1956: Die Stamme van die Distrik Carolina, Departement van Naturellesake, Etnologiese reeks nr. 34, Die Staatsdrukker, Pretoria.
- Sampson, C.G. 1968. The Middle Stone Age of the Orange River Scheme Area. National Museum, Bloemfontein. Memoir, no. 4.
- Sampson 1972. The Stone Age Industries of the Orange River Scheme and South Africa. National Museum, Bloemfontein. Memoir, no. 6.
- Smith R. 2004. The Battle Of Onverwacht* (Known by the British as 'Bankkop'), 4 January 1902 Military History Journal Vol 13 No 2
- Van Der Westhuizen, G.P. And Van Der Westhuizen, E., (2000). Guide To The Anglo Boer War In The Eastern Transvaal, 1899-1902, 100 Years. Volksrust: G.P. van der Westhuizen.
- Zubieta, L. & Smith, B.W. 2007 The Power Of Ancient Art (With L. Zubieta). In: Delius, P. (Ed.) Mpumalanga: History And Heritage: 69-89. Pietermaritzburg: University Of Kwazulu-Natal Press.

9.2 UNPUBLISHED REFERENCES

- Antonites, X. 2020. Heritage impact assessment report: proposed stone mining and crushers on Portion 15 of Rietspruit 437 IS, Ermelo, Mpumalanga Province.
- Birkholtz, P. 2008. Phase 1 Heritage Impact Assessment for the Lothier Siding for Golfview Mining (Pty) Ltd. on the Farm Leliefontein 136 IT Portion 6 in the Vicinity of Ermelo, Mpumalanga Province, South Africa.

- Birkholtz, P. 2010. Phase 1 Heritage Impact Assessment proposed the establishment of the Van Ouds Colliery On Portions 20, 23, 32 And 51 of the farm Van Oudshoornstroom 261-It, in the vicinity of Ermelo, Mpumalanga Province.
- Fourie, W. 2008. Archaeological Impact Assessment Camden Power Station Rail expansion project on portions of the farm Mooiplaats 290 IT and the farm Camden Power Station 329 IT, District Ermelo, Mpumalanga.
- Fourie, W. 2008. Archaeological Impact Assessment for the proposed mining development for Xstrata Group Spitzkop Mine, Breyten – Ermelo Region, Mpumalanga Province.
- Fourie, W. 2009. Heritage Impact Assessment for the Spitzkop Colliery, District Ermelo, Mpumalanga.
- Hardwick, S. & du Piesanie, J. 2019. Heritage Impact Assessment for the Integrated Environmental Authorisation Process for the Proposed Dagsoom Twyfelaar Coal Mining Project near Ermelo, Mpumalanga.
- Kitto, J. 2013. Heritage Impact Assessment for the proposed expansion of mining activities on Portion 25 of the Farm Witbank No 262 It, Ferreira's Extension of Penumbra Mine, near Ermelo, Gert Sibande District Municipality, Mpumalanga Province.
- Magoma, M. 2013. Phase 1 archaeological impact assessment specialist study report for the proposed township establishment of 5760 Stands on Portion 6 of Farm Rietspruit 437- is in Ermelo Region within Msukaligwa Local Municipality of Gert Sibande District, Mpumalanga Province.
- Pistorius, J. C. C. 2007. A Phase 1 Heritage Impact Assessment Study for the Proposed New 88 kV Power Line Running from the Majuba Power Station near Amersfoort to the Camden Power Station near Ermelo in the Mpumalanga Province.
- Richard, M. 2019. Phase 1 heritage impact assessment report for the proposed construction of New Ermelo Primary School On Erf 9248 Ermelo Extension 34 in Ermelo, Msukaligwa Local Municipality Of Mpumalanga Province.
- Rossouw, L. 2017. Phase 1 Heritage Impact Assessment of a proposed new Eskom 132kV power line between the Rouxville substation in the Free State Province and the Melkspruit substation in Aliwal North, Eastern Cape Province.
- Van Schalkwyk, L. 2006. Heritage impact assessment of n11 borrow pits, Ermelo to Amersfoort, Mpumalanga Province, South Africa.
- van Vollenhoven, A. 2012. A report on a heritage impact assessment for a proposed Opencast Coal Mine On The Farms Joubertsvlei 260 It and Meppel 264 It, close to Ermelo, Mpumalanga Province.

9.3 HISTORIC TOPOGRAPHIC MAPS

All the historic topographic maps used in this report were obtained from the Directorate: National Geo-spatial Information of the Department of Rural Development and Land Reform in Cape Town.

9.4 CONTEMPORARY CARTOGRAPHIC DATA

MapSource and Google Earth were used to depict contemporary cartographic data.

9.5 INTERNET SOURCES

<https://screening.environment.gov.za/screeningtool/>

<http://samilitaryhistory.org/vol132rs.html>

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, Mozambique, Malawi, Mauritius, Zimbabwe and the Democratic Republic of the Congo

CURRICULUM FOR CHERENE DE BRUYN

Name: Cherene de Bruyn
Profession: Archaeologist
Date of Birth: 1991-03-01
Parent Firm: PGS Heritage (Pty) Ltd
Position in Firm: Archaeologist
Years with Firm: 9 Months
Years' experience: 2
Nationality: South African
HDI Status: White Female

EDUCATION:

Name of University or Institution : University of Pretoria
Degree obtained: : BA
Major subjects : Archaeology and Anthropology
Year : 2010-2012

Name of University or Institution : University of Pretoria
Degree obtained : BA (Hons)
Major subjects : Archaeology
Year : 2013

Name of University or Institution : University of Pretoria
Degree obtained : BSc (Hons)
Major subjects : Physical Anthropology
Year : 2015

Name of University or Institution : University College London
Degree obtained : MA
Major subjects : Archaeology
Year : 2016/2017

Professional Qualifications:

Association of Southern African Professional Archaeologists - Professional Member (#432)

Association of Southern African Professional Archaeologists - CRM Accreditation

- Principal Investigator: Grave relocation
- Field Director: Colonial period archaeology, Iron Age archaeology
- Field Supervisor: Rock art, Stone Age archaeology
- Laboratory Specialist: Human Skeletal Remains

International Association for Impact Assessment South Africa - Member (#6082)
KZN Amafa and Research Institute – Accredited Heritage Practitioner (Since 2020)

Languages:

Afrikaans & English

KEY QUALIFICATIONS

Heritage Impact Assessment Management, Historical and Archival Research, Archaeology, Physical Anthropology, Grave Relocations, Fieldwork and Project Management including *inter alia*

Summary of Experience

Involvement in various grave relocation projects and grave “rescue” excavations in the various provinces of South Africa

Involvement with various Heritage Impact Assessments, within South Africa

- Heritage Impact Assessments for various projects

HERITAGE ASSESSMENT PROJECTS

Below a selected list of Heritage Impact Assessments (HIA) Projects involvement:

- Heritage Impact Assessment for the upgrade of road d4407 between Hluvukani and Timbavati, road d4409 at Welverdiend and road d4416/2 between Welverdiend and road P194/1 in the Bohlabela region of the Mpumalanga Province.
- Heritage Impact Assessment for the proposed Piggery on Portion 46 of the farm Brakkefontien 416, within the Nelson Mandela Bay Municipality, Eastern Cape.
- Heritage Impact Assessment for proposed development On Erf 30, Letamo Town, Farm Honingklip 178 Iq, Mogale Local Municipality, Gauteng Province.
- Heritage Impact Assessment for the proposed Prospecting Right Application on the Farm Reserve No 4 15823 And 7638/1, near St Lucia, within the jurisdiction of the Mfolozi Local Municipality in the King Cetshwayo District Municipality, KwaZulu-Natal Province.
- Heritage Impact Assessment for the proposed mining rights on the Farm Waterkloof 95 located between Griekwastad and Groblershoop in the Pixley Ka Seme District Municipality within the Northern Cape Province.
- Heritage Impact Assessment for the proposed East Coast Gas 400 Kv Power Lines, located in Richards Bay, within the Umhlatuze Local Municipality in the King Cetshwayo District Municipality in the Kwazulu-Natal Province.
- Heritage Impact Assessment for the mining right application for the Farm Woodlands 407, situated in the Free State Province.
- Heritage Impact Assessment for the refurbishments of Lyttelton Primary School, Lyttelton Manor, Centurion, Gauteng Province.
- Heritage Impact Assessment for the amendment of an existing prospecting right and environmental authorization for Bothaville NE Ext A, situated in the Free State Province.

- Heritage Impact Assessment and Integrated Cultural Resources Management Study for The Proposed Mfolozi-Mbewu 765kv Transmission Line, Zululand And King Cetshwayo District Municipality, KwaZulu-Natal.
- Heritage Impact Assessment for the proposed for the Construction of the Bulk Water Supply Pipeline and Feeder Pipes in Dunnottar, Gauteng Province.
- Heritage Impact Assessment the prospecting right and environmental authorisation application for Kroonstad South situated in the Free State Province.
- Archaeological impact assessment for a mining permit application for portion 19 of the farm Syferfontein 303 IP within the city of Matlosana Local Municipality in the North West Province.

GRAVE RELOCATION PROJECTS

Below, a selection of grave relocation projects involvement:

- Report on the relocation of graves. Relocation of four stillborn graves from the Farm Wonderfontein 428 Js, Belfast, Mpumalanga Province.
- Report on the relocation of graves. Relocation of approximately 6 graves from Kwaqubuka Tribal Area, Mtubatuba Local Municipality, Kwa-Zulu Natal Province. Grave exhumation and relocation of 19 graves on erf 3 of Holding 87 North Riding Agricultural Holdings, City of Johannesburg, Gauteng Province.
- Report on the exhumation and reburial report of 16 graves from Doornkop, to Voortrekker Cemetery in Middelburg, Mpumalanga Province
- Report on rescue excavations and skeletal analyses of two archaeological graves inadvertently uncovered in Boitekong, North-West Province.
- Rescue excavation of an unmarked graveyard at Diamond Park, Greenpoint, Kimberley, Northern Cape Province.
- Report on Follow-up site visit excavation and physical anthropological analyses of archaeological human remains transferred from SAPA Victim Identification Centre to Department of Anatomy. Mamelodi East Phase 2 House 566.
- Excavation of human remains from Marulaneng village, Bakenberg Limpopo Province.
- Follow up site visit on human remains found at Bothlokwa (Ramatjowe & Mphakahne), Limpopo Province.
- Follow up site visit on human remains found in Waterpoort, Soutpansberg, Limpopo Province.

EMPLOYMENT SUMMARY:

Positions Held

- 2020 – to date: Archaeologist - PGS Heritage (Pty) Ltd
- 2019: Manager of the NGT ESHS Heritage Department – NGT Holdings (Pty) Ltd
- 2018 – 2019: Archaeologist and Heritage Consultant – NGT Holdings (Pty) Ltd
- 2015-2016: Archaeological Contractor - BA3G, University of Pretoria

- 2014 – 2015: DST-NRF Archaeological Intern, Forensic Anthropological Research Centre

I, Cherene de Bruyn, hereby confirm that the above information contained in my CV is true and correct.



C de Bruyn

1 October 2020

Date