



PGS
HERITAGE

THE PROPOSED SAMANCOR CHROME LTD (WESTERN CHROME MINES) WATERKLOOF SECTION OPENCAST PROJECT. SAMANCOR WCM – WATERKLOOF SECTION FALLS UNDER THE JURISDICTION OF THE BOJANALA PLATINUM DISTRICT COUNCIL AND THE RUSTENBURG LOCAL MUNICIPALITY, IN THE NORTHWEST PROVINCE. THE MINE IS LOCATED ON PORTIONS OF WATERKLOOF 305 JQ, NORTHWEST

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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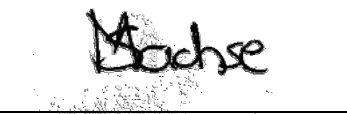

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ACKNOWLEDGEMENT OF RECEIPT

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EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd (PGS) was appointed by Samancor to undertake a Heritage Impact Assessment (HIA) which will serve to inform the Basic Assessment Report (BAR) and Environmental Management Programme (EMPr) for the proposed development of the Waterkloof Section Opencast Project. Samancor WCM Falls Under the Jurisdiction of the Bojanala Platinum District Council and the Rustenburg Local Municipality, in the Northwest Province. The Mine is located on portions of Waterkloof 305 JQ, Northwest Province.

Heritage resources are unique and non-renewable and as such, any impact on such resources must be seen as significant.

During the survey 2 areas with multiple foundations and broken-down buildings were identified. The first area (**WK001** and **WK002**) towards the central section of the project area consisted of two buildings of which only the walls remained and a series of small foundations and piles of building rubble.

The second area (**WK003**) is situated on the north-western corner of the project area and consists of multiple small foundation remnants and a series of tall trees.

None of the structure had any heritage value and thus **not conservation worthy**.

Local residents also identified the location of two possible graves (**WK004** and **5**) and a burial ground at **WK006** that have a high heritage significance.

The palaeontological sensitivity of the area is also rated as insignificant.

Refer to the mitigation measures as indicate in **Table 18**.

General

It is the author's considered opinion that overall impact on heritage resources is Very 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
GN	Government Notice
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
IAIASA	International Association for Impact Assessment South Africa
LCTs	Large Cutting Tools
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
PGS	PGS Heritage (Pty) Ltd
PHRA	Provincial Heritage Resources Authority
PIA	Palaeontological Impact Assessment
PSSA	Palaeontological Society of South Africa
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

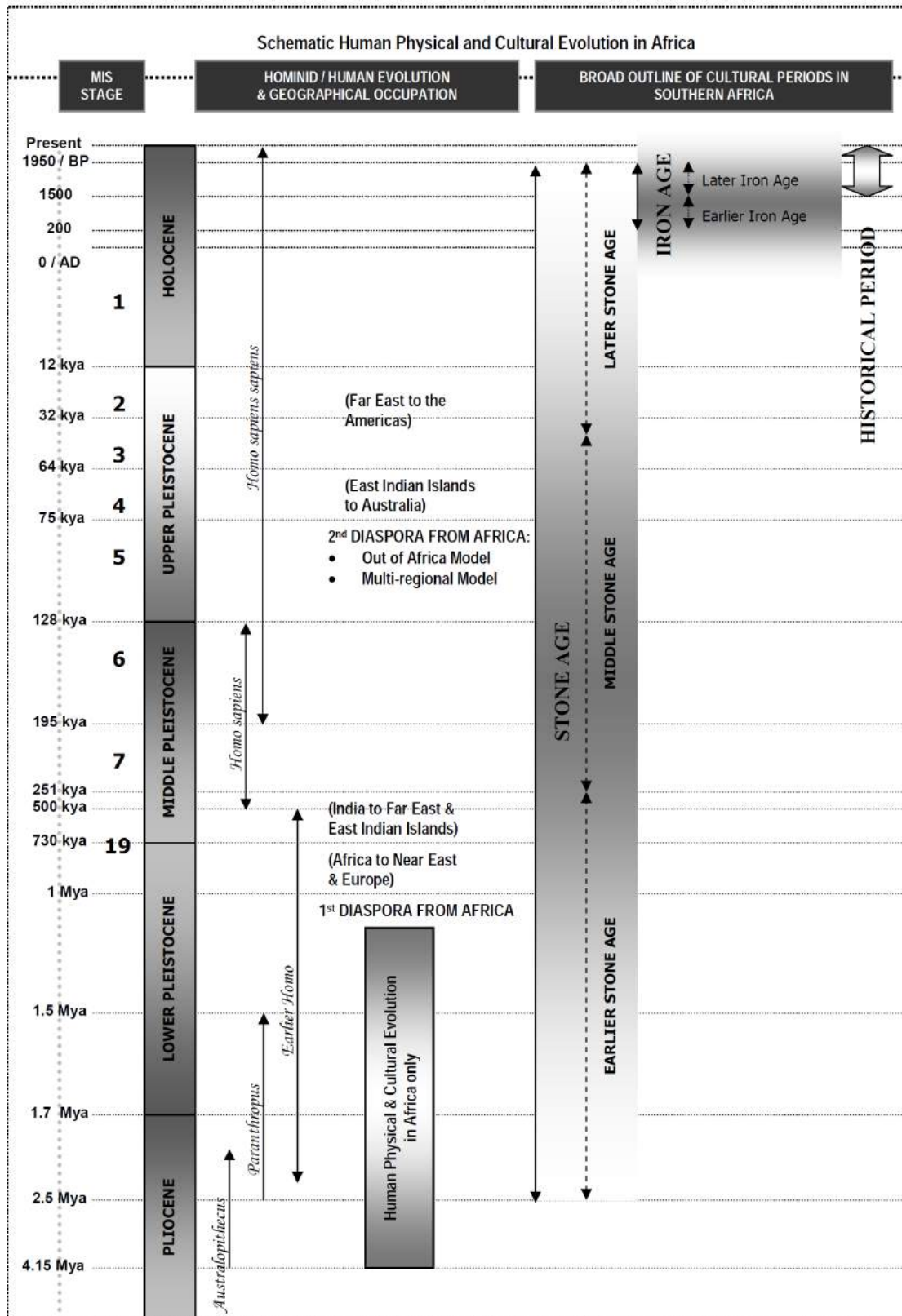


Figure 1 – Human and Cultural Timeline in Africa (Morris, 2008)

1 INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) was appointed by Samancor to undertake a Heritage Impact Assessment (HIA) which will serve to inform the Basic Assessment Report (BAR) and Environmental Management Programme (EMPr) for the proposed development of the Waterkloof Section Opencast Project. Samancor (WCM) falls under the jurisdiction of the Bojanala Platinum District Council and the Rustenburg Local Municipality, in the Northwest Province. The Mine is located on portions of Waterkloof 305 JQ, Northwest 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 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 Heritage.

The staff at PGS have 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 and principal author, is registered with the 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).

Ruan van der Merwe field archaeologist holds a BA (Hons) in Archaeology.

Michelle Sachse is the co-author of this report and field archaeologist. She holds a MA in Archaeology.

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 5.5	
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 6.1	-
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 1.1	-
(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 and Appendix A	-
(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 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 18	
(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 8.11	
(l) Any conditions for inclusion in the environmental authorisation		None required
(m) Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 8.11	
(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		

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Relevant section in report	Comment where not applicable.
(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 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

- 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

The property is located just south of the R104 road, 3,5km to the east of Rustenburg town (**Figure 2**).

Samancor proposes the establishment of an opencast pit on this portion of the property (**Figure 3**).

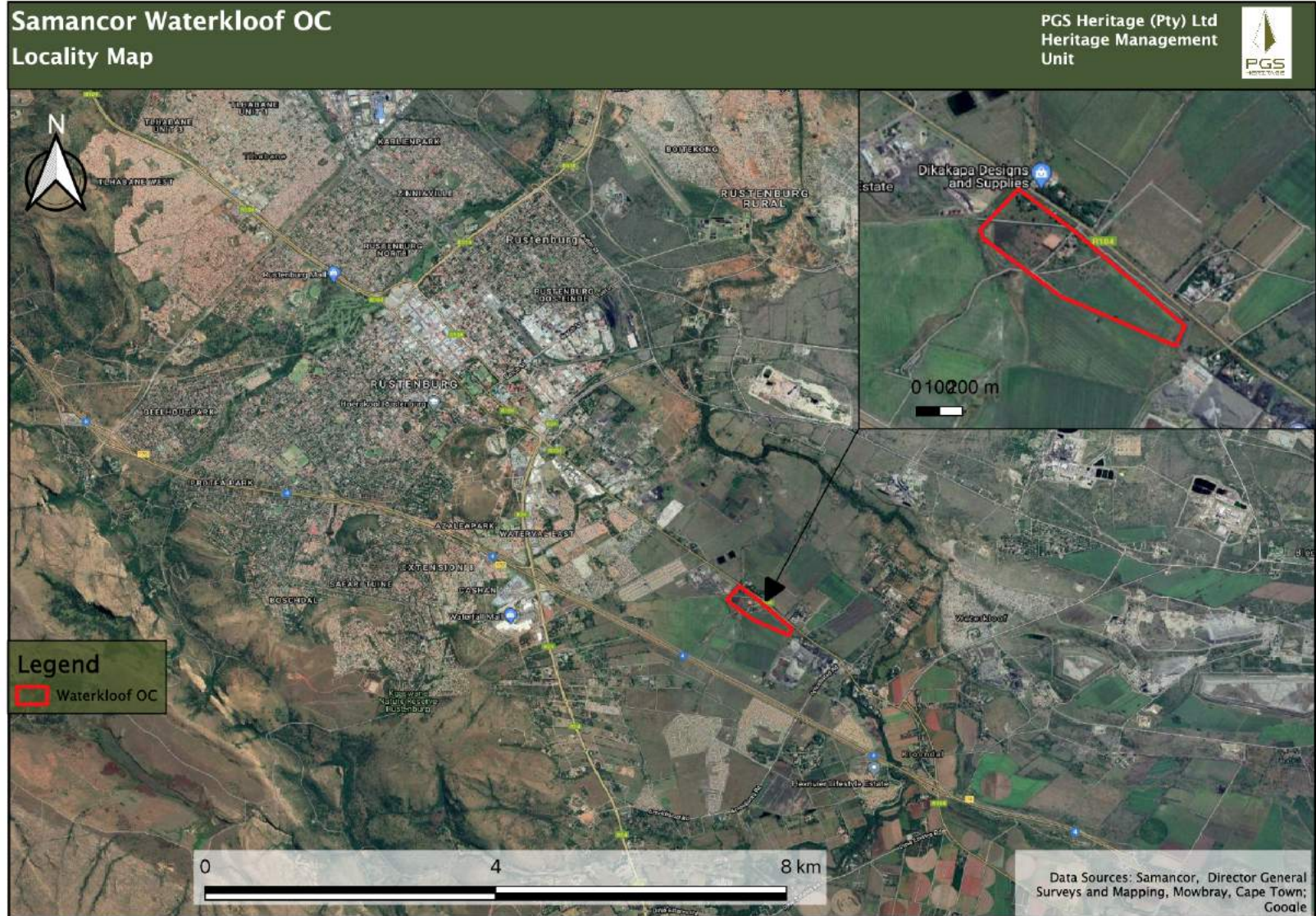


Figure 2 – Locality map of the proposed opencast pit

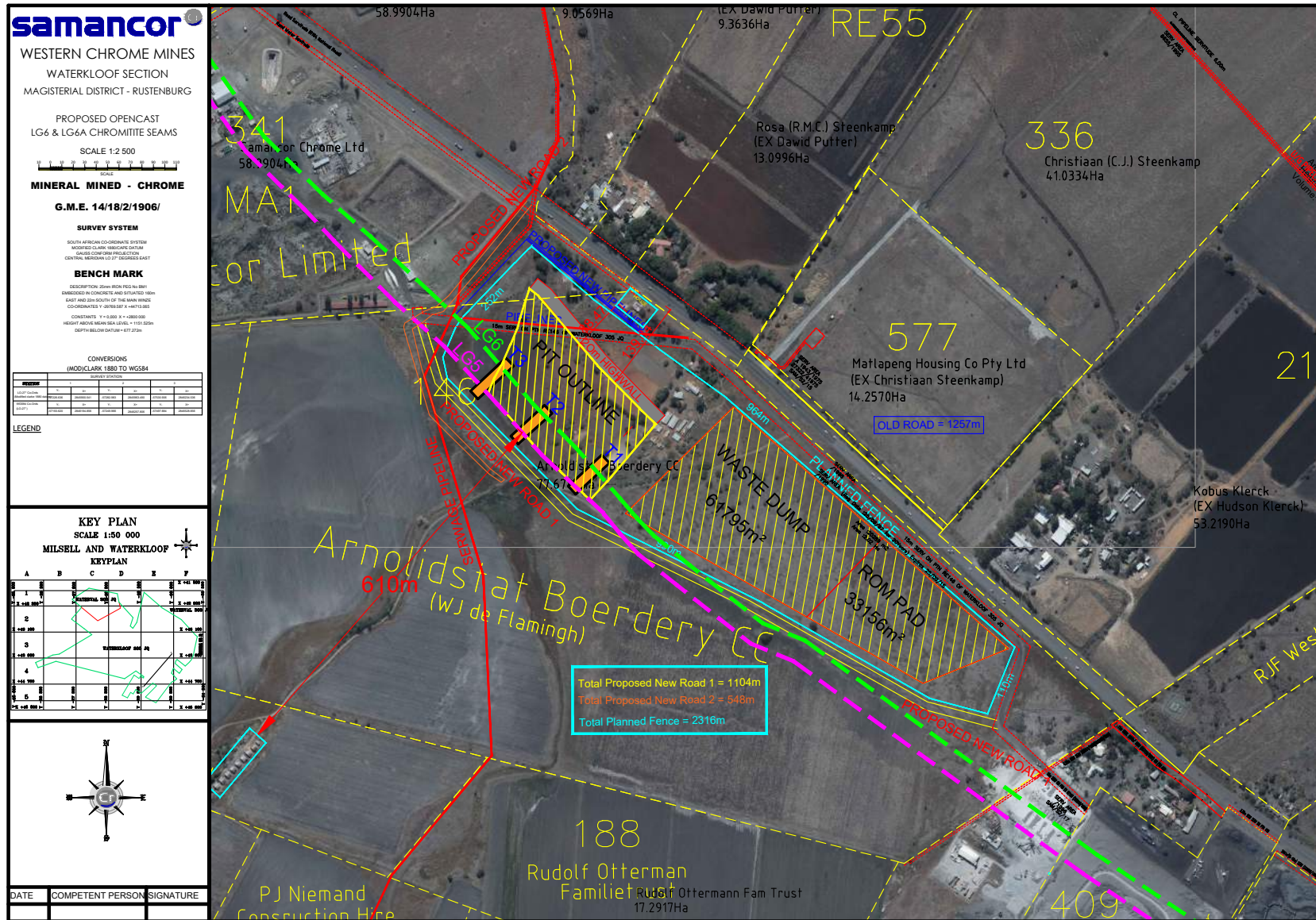


Figure 3 – Locality map of the proposed opencast pit

2.2 Project description

Samancor Waterkloof is a proposed opencast mine where the chrome ore will be mined through free digging and blasting and processed dry through a mobile crushing and screening plant to produce various size fractions of chromite ore as products. Surface infrastructure will include haul roads, ROM Pad, topsoil and waste rock dumps, power supply, a workshop, administrative office, bulk services and a weighbridge. Waste product will be deposited on waste rock dumps and later backfilled into the opencast void and the ROM will be transported to various Samancor Plants for further processing.

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 10-14 August 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**).

¹ According to Notice 648 of the Government Gazette 45421

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 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.	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
	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 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

The project area is situated in an active mining area along the R104 southeast of Rustenburg (**Figure 4**). The project footprint falls within an area that is currently vacant with signs of use as a small business

revolving around equestrian activities. The project area contains a small gravel road that has been built for mining activities of the adjacent mines (**Figure 5**).

The study area consists of highly disturbed terrain as a result of equestrian as well as agricultural activities.

Visibility was low in some areas due to the overgrowth of ground vegetation. The sections of the project area that has been used for agricultural purposes was harvested fairly recently giving high visibility in this area exclusively (**Figure 6**).

The central section of the project area consists of a series of broken-down structures and foundations. The eastern section consists of agricultural fields and the western section consists of an open field with fairly overgrown grass and scattered thickets of young trees (**Figure 7 to Figure 9**).



Figure 4 - The site was accessed via the R104 turning onto an unnamed gravel road.



Figure 5 – Gravel Road running along the northern edge of the project area.



Figure 6 – View of the eastern agricultural fields of the project area facing the Samancor Waterkloof main facility.



Figure 7 – View of the western section of the project area



Figure 8 – View of the central section of the project area.



Figure 9 – Remnants of a Horse-riding arena.

5 DESKTOP STUDY FINDINGS

5.1 Historic Overview of Study Area and Surrounding Landscape

DATE	DESCRIPTION
2.5 million to 250 000 years ago	<p>The Earlier Stone Age is the first and oldest 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 back to approximately 1.5 million years ago.</p> <p>A number of Early Stone Age sites are known from the general vicinity. One of these is situated close to the study area (Huffman, 2005).</p>
250 000 to 40 000 years ago	<p>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.</p> <p>A MSA site is located approx. 7km north-west of the study area, and three sites comprising Iron Age pottery as well as Middle Stone Age lithics were identified roughly 3 km to the north as well as 5.1km and 5.2km to the north-west of the study area (Huffman, 2005). A Middle Stone Age find spot was also identified 5.6km north-east of the study area during the survey of the Turffontein No. 2 area (Huffman, 2005). Lastly, a site comprising Middle Stone Age material as well as Iron Age pottery has been identified in proximity to the study area (Huffman, 2005).</p>

DATE	DESCRIPTION
40 000 years ago to the historic past	The Later Stone Age is the third archaeological phase identified and is associated with an abundance of very small artefacts known as microliths.
AD 1450 – AD 1650	<p>The Ntsuanatsatsi facies of the Blackburn Branch of the Urewe Ceramic Tradition represents the earliest known Iron Age period within the surroundings of the study area. The decoration on the ceramics from this facies is characterised by a broad band of stamping in the neck, stamped arcades on the shoulder and appliqué (Huffman, 2007).</p> <p>Huffman (2007) suggest that the Ntsuanatsatsi facies can be directly linked to the early Bafokeng who regarding this theory were the first Mbo Nguni people to leave present-day KwaZulu-Natal.</p>
AD 1500 - AD 1700	<p>The Olifantspoort facies of the Moloko Branch of the Urewe Ceramic Tradition is the second Iron Age facies to be identified within the surroundings of the study area. The Olifantspoort facies can likely be dated to between AD 1500 and AD 1700. The key features of the decoration used on the ceramics from this facies include multiple bands of fine stamping or narrow incision separated by colour (Huffman, 2007).</p> <p>The type site for this facies is located on the farm Olifantspoort 328 JQ, which is situated approx. 15km south-west of the present study area. An Olifantspoort site was also identified roughly 98m north-west of the study area during the survey for the UG2 expansion area (Huffman, 2005).</p> <p>After an archaeological team under Professor R.J. Mason of the University of the Witwatersrand identified a number of stonewalled settlements on the farm Olifantspoort by using aerial photographs, archaeological field research and excavations were undertaken during 1971 at eight of these sites located on the farm Olifantspoort as well as another site located on an adjacent farm. These sites were numbered 20/71, 21/71, 26/71, 27/71, 28/71, 60/71, 61/71, 62/71, 64/71 and 65/71. The focus of the research turned to Site 20/71 which proved to be a very large stonewalled site. A total of 85 huts as well as a number of middens were excavated here during the 1971 season alone. As many as 80 individual rock engraving panels were identified in the vicinity of the site. These engravings all depict settlement plans (Mason, 1973). A copper mine was also identified on the farm (Steel, 1987). In the following year sites 2/72 and 29/72 were added and researched, with sites 38/73 and 47/73 added the year after. A few years later in 1984 an Olifantspoort site was identified at Broederstroom and in 1985 another Olifantspoort site was identified at Ifafi (Huffman, 2007).</p> <p>The Olifantspoort facies holds an important position in the sequence of the Moloko or Sotho-Tswana group. The earliest facies to be associated with the</p>

DATE	DESCRIPTION
	<p>Moloko is the Icon facies (AD 1300 – 1500), with sites found across large sections of what is today the Limpopo Province. The Icon facies resulted in three different and parallel Iron Age facies, namely the Madikwe facies (AD 1500 – 1700) (which in turn led to the Buispoort facies between AD 1700 and 1850), the Letsibogo facies (AD 1500 – 1700) and thirdly the Olifantspoort facies. The Olifantspoort facies developed into the Thabeng facies (AD 1700 – 1850) (Huffman, 2007). It is therefore evident that the Olifantspoort facies represents a key pillar in our understanding of the origins and sequence of the Sotho-Tswana people of today (Huffman, 2007).</p> <p>Sites associated with the Olifantspoort facies are known from the direct vicinity of the study area. One such an example is Site 6 identified by Professor Tom Huffman within the UG2 Expansion Project Area (Huffman, 2005). This site is located close to the present study area.</p>
AD 1650 – AD 1850	<p>The Uitkomst facies of the Blackburn Branch of the Urewe Ceramic Tradition represents the third Iron Age period to be identified for the surroundings of the study area. This facies can likely be dated to between AD 1650 and AD 1820. The decoration on the ceramics associated with this facies is characterised by stamped arcades, appliqué of parallel incisions, stamping and cord impressions and is described as a mixture of the characteristics of both Ntsuanatsatsi (Nguni) and Olifantspoort (Sotho) (Huffman, 2007).</p> <p>The type-site is Uitkomst Cave, which is situated approximately 46km south-east of the study area. The site was excavated by Professor R.J. Mason of the University of the Witwatersrand as part of a project to excavate five cave sites in the Witwatersrand-Magaliesberg area. These five sites are Glenferness, Hennops River, Pietkloof, Zwartkops and Uitkomst. Uitkomst was chosen as the type site for the particular Iron Age material excavated at these sites as the Uitkomst deposit was found to be well stratified and the site “...illustrates the combination of a certain kind of pottery with evidence for metal and food production and stone wall building found at the open sites...” (Mason, 1962:385).</p> <p>The Uitkomst pottery is viewed as a combination of Ntsuanatsatsi and Olifantspoort, and with the Makgwareng facies is seen as the successors to the Ntsuanatsatsi facies. The Ntsuanatsatsi facies is closely related to the oral histories of the Early Fokeng people and represents the earliest known movement of Nguni people out of Kwazulu-Natal into the inland areas of South Africa. Regarding this theory, the Bafokeng settled at Ntsuanatsatsi Hill in the present-day Free State Province. Subsequently, the BaKwena lineage had</p>

DATE	DESCRIPTION
	<p>broken away from the Bahurutshe cluster and crossed southward over the Vaal River to come in contact with the Bafokeng. As a result of this contact a Bafokeng-Bakwena cluster was formed, which moved northward and became further 'Sotho-ised' by coming into increasing contact with other Sotho-Tswana groups. According to this theory, this eventually resulted in the appearance of Uitkomst facies type pottery which contained elements of both Nguni and Sotho-Tswana speakers (Huffman, 2007). Huffman states that that the Uitkomst facies is directly associated with the Bafokeng (Huffman, 2007). However, it worth noting that not all researchers agree with this preposition of the Bafokeng origins. In their book on the history of the Bafokeng, Bernard Mbenga and Andrew Mason indicate that the research of Prof. R.J. Mason and Dr. J.C.C. Pistorius "...would indicate that the Bafokeng originated from the Bahurutshe-Bakwena-Bakgatla lineage cluster. Tom Huffman holds a different view..." (Mbenga & Mason, 2010).</p> <p>Uitkomst sites are well known from the surroundings of the study area. Two examples of Uitkomst sites from the vicinity of the study area are two stone walled sites located roughly 3km to the north and 5 km to the north-east of the present study area. These sites were identified during the survey of the Turffontein No. 2 and Turffontein West areas (Huffman, 2005).</p>
AD 1700 – AD 1840	<p>The Buispoort facies of the Moloko branch of the Urewe Ceramic Tradition is the next phase to be identified within the study area's surroundings. 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). It is believed that the Madikwe facies developed into the Buispoort facies. The Buispoort facies is associated with sites such as Boschhoek, Buffelshoek, Kaditshwene, Molokwane and Olifantspoort (Huffman, 2007).</p>
Early 1700s	<p>At the time, and possibly for some time before this date, the area surrounding present-day Rustenburg would have been occupied by the Bafokeng and the Tlokwa people (Hall et al., 2008). Mbenga and Mason (2010) indicate that Prof. R.D. Coertze estimation was that the Bafokeng had settled in the vicinity of Rustenburg at the end of the 17th century. Their land at the time stretched from the "...Ngwaritsi (Selons) River to the west, the Bakwena-ba-Mogopa to the east, the Magaliesberg to the south and the Kgetleng (Elands) River to the north (Mbenga & Mason, 2010: 7). At roughly this time the capital of the Bafokeng was moved to the Boschpoort area (Mbenga & Mason, 2010). The farm Boschpoort 284JQ is situated roughly 9km north of the present study area.</p>

DATE	DESCRIPTION
	<p>According to Pistorius (2001) the mountain range traditionally known as the Maralla-a-Nape stretches from the vicinity of the Pilanesberg south-eastward ending up roughly between present-day Rustenburg and Marikana. This mountain range: "...is one of the early beacons where the Bafokeng settled when they arrived from the north in the Rustenburg district..." (Pistorius, 2001:47). He also quotes the Bafokeng author and oral historian Naboth Mokgatle in saying that various clans settled along the Maralla-a-Nape mountain range at settlements (from north to south) such as Serutube, Marakana, Tsitsing (Kanana), Thekwane and Photsaneng (Bleskop) (Pistorius, 2001). These settlements are still located along the Maralle-a-Nape mountain range and are still known by their original names, although in some cases (such as Photsaneng and Bleskop) attempts may have been made with the arrival and settlement of white people to rename some of these settlements, albeit not always successfully.</p> <p>Evidence for the settlement of the Maralla-a-Nape range hundreds of years ago was found by Pistorius (2001) in the form of a number of Late Iron Age stonewalled settlements located along this mountain range. Similarly, Professor Tom Huffman has also identified a large number of Late Iron Age sites associated with areas such as Photsaneng and Thekwane (Huffman, 2005). Incidentally, Photsaneng is located less than a kilometre north of the present study area whereas Thekwane is located roughly 3 km further to the north. It is also worth noting that the Maralla-a-Nape range crosses over the present study area as well.</p>
Late 1700s	<p>During the reign of kgosi Sekete IV the Bafokeng had "...relations of conflict..." with their Batswana neighbours. Of interest for the present study area, is that during this time of unrest the Bafokeng established themselves at the confluence of the Matsokubyane (Hex) and Tlhabane Rivers, in the vicinity of where present-day Rustenburg today stands. They called this settlement Tlhabane (Mbenga & Mason, 2010).</p>
c. 1800	<p>The Bafokeng moved from Tlhabane in a north-western direction and settled at Phokeng (Mokgatle, 1971; Mbenga & Mason, 2010).</p>
1827 - 1832	<p>During this time the Khumalo Ndebele of Mzilikazi established themselves along the Magaliesberg Mountains. They had moved here from the central Vaal River. In c. 1832 the Khumalo Ndebele moved to the Marico River to the north-west (Bergh, 1999).</p>
1836	<p>The first Voortrekker parties started crossing the Vaal River (Bergh, 1999).</p>


DATE	DESCRIPTION
Late 1830s – Early 1840s	<p>These years saw the early establishment of farms by the Voortrekkers in the general vicinity of the study area (Bergh, 1999). One of these Voortrekkers was Stephanus Johannes Paulus Kruger, who was President of the Zuid-Afrikaansche Republiek between 1883 and the end of the South African War in 1902. His family formed part of the Voortrekkers who settled in these parts during this time and, in 1841 at the age of 16 Kruger himself became an owner of a farm near Rustenburg (likely Waterkloof).</p> <p>During this period, the first contacts between the black people residing in the Rustenburg area at the time (including the Bafokeng) and white people took place. According to Bergh (2005) these early contacts resulted in the setting aside of land by the Voortrekker leadership for the Bafokeng people. This land appears to have included the farms Boekenhoutfontein 260 IQ (22.6 km north-west of the study area), Turffontein 262 IQ (21.6 km north-west of the study area) and possibly Kookfontein 265 IQ (16 km north-west of the study area) as well. However, within a short period the Bafokeng people were dispossessed of these properties (Bergh, 2005).</p>
1851	Both the district and town of Rustenburg were established in this year (Bergh, 1999). The study area fell within the Rustenburg district at the time.
1858	A Lutheran Mission Station was established at what is today known as the town of Kroondal. The mission station was established on the farm Kronendal which was owned by Jan Michiel van Helsing (Erasmus, 2004). The Kroondal Mission Station eventually became one of 22 Lutheran mission stations in South Africa where both the missionaries and farmers living on the property of the mission station were initially supported by the missionary society (Erasmus, 2004). The town of Kroondal is 1.7 km south-west of the present study area.
10 February 1859	The very first Reformed Church (Gereformeerde Kerk) was established in South Africa on this day. The church was established under a Syringa tree in Church Street, Rustenburg. The stump of this tree was proclaimed as a National Monument in 1951 (Bergh, 1999). This tree is located approx. 9.7km west of the present study area. Incidentally, the Anglican Church of Rustenburg was proclaimed a National Monument in 1972 and the Dutch Reformed Church of Rustenburg was proclaimed a National Monument in 1979.
1867	Hermannsburg missionary Hermann Wenhold established the Kana mission station amongst the Bafokeng. At the time the mission station was established on the farm Tweedepoort 283 JQ (Bergh, 2005). This farm is situated roughly 12 km north of the study area.

DATE	DESCRIPTION
December 1869	The Kana mission station was moved from the farm Tweedepoort 283 JQ to the farm Reinkoyalskraal 278 JQ (Bergh, 2005). This new location for the Kana Mission Station is located roughly 11km north-west of the study area.
1860s – 1870s	<p>With the assistance provided by German missionary Christoph Penzhorn of the Hermannsburg Missionary Society, Kgosi Mokgatle and the Bafokeng bought a number of farms (Bergh, 2005). These acquisitions were an attempt by the Kgosi and the Bafokeng to procure land which had been theirs before the arrival of the first white people.</p> <p>According to Mbenga & Manson (2010) a total of 24 farms were acquired by the Bafokeng during the second half of the 19th century. Of these, the closest two farms to the present study area are Turffontein (located directly north of the present study area) and a portion of the farm Klipfontein (the present-day farm of Waterval 303 IQ comprises a section of the farm Klipfontein).</p>
1880-1881	<p>The First Boer War (First War of Independence) took place during this time. The most significant aspect of the war for the town of Rustenburg would have been the besiegement of a company of 2nd Batallion Royal Scots Fusiliers by Boer forces. The siege lasted for 93 days. While the earthwork fort in which the British forces were besieged does not exist anymore, its present location would have been the corner of Kerk and Von Wielligh Streets. This position is approx. 10 km west of the present study area (Wulfsohn, 1992).</p>



Figure 10 - Photograph taken in 1887 of Kgosi Mokgatle and his sons (Mbenga & Manson, 2010).

DATE	DESCRIPTION
1899 - 1902	<p>During the Anglo Boer War (1899-1902) the town of Rustenburg had some role to play. This was largely due to its strategic position halfway between Zeerust and Pretoria as well as its location near two important passes over the Magaliesberg range, namely Olifants Nek and Magato's Nek. During the initial phase of the war very few military activities took place in this area. After the British advance into the republics and the occupation of Pretoria (5 June 1900), the Rustenburg area became significant. On 15 June 1900, the town was occupied by a British force under Major-General Robert Stephenson Baden-Powell. On 4 July 1900 it was evacuated by the British and occupied once again the following day on 5 July 1900 by a small British force of 50 men, supported during the afternoon by another 140 men. Soon thereafter, the Rustenburg Commando under General Lemmer attacked the town. They were repulsed when two squadrons of Australians arrived. On 7 August 1900 it was evacuated by the British in light of Lord Roberts' decision to evacuate all the smaller British positions in the then Western Transvaal, which included the town of Rustenburg. The Boer forces occupied the town on the same day, and remained in possession of Rustenburg until 16 August 1900 when a force under Lord Methuen pushed over Magatos Nek and reoccupied Rustenburg. However, this occupation was short-lived in that the British evacuated the town during the end of August 1900 leaving it in Boer hands once more. On 26 September 1900 General Cunningham's column occupied it again. For the remainder of the war until the cessation of hostilities in 1902 Rustenburg remained in British hands (Wulfsohn, 1992).</p> <p>While no skirmishes or battles are known from within the study area, one of the more significant of these from the direct surroundings was certainly the Battle of Buffelspoort of 3 December 1900. The battle entailed the attack of the commandos of Generals De La Rey and Smuts and Commandant K. Boshoff on the British Convoy under the overall command of Major J.S. Wolrige-Gordon en route from the Rietfontein military camp to Rustenburg (Wulfsohn, 1992) The battlefield is located roughly 5km south-east of the present study area.</p>
1924	<p>In this year, the famous geologist Hans Merensky was shown a sample of platinum ore that a Mr. Andries Lombard had found near Lydenburg. Merensky managed to trace a platinum reef all along the outer edge of the Bushveld Complex from Lydenburg to Rustenburg. This reef was to be known as Merensky Reef (Carruthers, 2007).</p>

DATE	DESCRIPTION
	<p data-bbox="906 678 1366 804"><i>Figure 11 - Dr. Hans Merensky, the geologist who discovered the platinum reef at Rustenburg (Machens, 2009).</i></p>
1925	Several companies were floated to mine the Merensky Reef in the vicinity of Rustenburg at the time (Carruthers, 2007).
27 August 1925	Potgietersrust Platinums was registered (SA Mining Yearbook, 1941/2).
29 September 1926	The Waterval (Rustenburg) Platinum Mining Company Limited was registered on this day (South African Mining Yearbook, 1941/2).
1927	The re-proclamation of the farm Rustenburg Townlands was applied for by the Potgietersrust Platinum Mines Limited (MNW, 876, MM804/27).
11 September 1931	Rustenburg Platinum Mines Ltd was registered on this day. It was formed by the amalgamation of Potgietersrust Platinums and the Waterval (Rustenburg) Platinum Mining Company (SA Mining Yearbook, 1941/2).

5.2 Significant Aspects Regarding the History and Archaeology of the Study Area

5.2.1 Early History of Platinum Mining within the Study Area

After the discovery of platinum in the vicinity of Rustenburg by Dr. Hans Merensky during 1924, a period similar to one of the gold rushes followed during which gambles were won and lost. Those who managed to get options on platinum bearing farms were the obvious winners. This period became known as the Platinum Boom and during this time the quest for options on profitable farms became a mad race as more and more people became interested in the promise of profits to be gained from the newly discovered

mineral reefs. Merensky himself commissioned two men by the names of Hans von Gernet and Schreiner Cooper to obtain as many options as possible from farm owners along areas Merensky believed to contain platinum. Due to the obvious advantage Merensky had as the discoverer of the platinum reefs, his rivals constantly spied on Merensky and his two associates, Von Gernet and Cooper. As a result, a cloak and dagger game developed whereby misinformation was spread on a daily basis to put any rivals of their tracks (Machens, 2009).

Eventually, as the dust started settling, as many as fifty individual mining companies had been established along the platinum fields of Lydenburg and Rustenburg by 1925. However, sanity soon prevailed as the realities and logistical challenges of mining became apparent. As a result, many of the smaller companies were bought by the larger ones or disappeared altogether. In some cases, mining companies that were established to mine the Lydenburg fields relocated their entire operations to the Rustenburg area, albeit keeping their original names (Wagner, 1973). An example of this is the company known as Potgietersrust Platinums Limited which will be discussed in more detail below.

By 1929, the most prominent mining companies within the study area and surroundings were Potgietersrust Platinums Limited, Transvaal Consolidated Land and Exploration Company Limited and the Colonial Mining Development Company Limited (Wagner, 1973).

5.2.2 Potgietersrust Platinums Limited and Rustenburg Platinum Mines Limited

Potgietersrust Platinums Limited was established on 7 August 1925 and according to Machens (2009) had as founding partners Gustav Adolf Eugene Becker, Hermann Ohlthaver, South African Townships as well as Anglo American with a start-up capital of £500,000. A few months later the Barnato group became another partner and brought capital to the value of £500,000 to the table. This said, the published history of the Johannesburg Consolidated Investment Company Limited (1965) indicates that the Johannesburg Consolidated Investment company had in fact acquired a controlling interest in the Potgietersrust Platinums Limited company as early as 1926.

As its name suggests, the company was established to mine the platinum deposits in the vicinity of Potgietersrust (present day Mokopane). However, after acquiring the Rustenburg properties of companies such as Premier Rustenburg Platinum Limited, the Steelpoort Platinum Syndicate Limited and the Eerstegeluk Platinum Mines Limited, the company started intensive mining operations on the Rustenburg fields as well. By 1929 Potgietersrust Platinums Limited boasted the most extensive holdings of any South African platinum mining company.

By the late 1920s, the company owned mineral rights over more than 842 morgen, 159 square roods on the farm Kroondal 304 JQ as well as mineral rights over 62 morgen, 105 square roods on the farm Klipfontein 300 JQ (Wagner, 1973).

Within the study area, the mining company was actively developing the Klipfontein-Kroondal Mine during the late 1920s (Wagner, 1973). By 1929 the Merensky Reef on this property had been opened up over a distance of 18,000 feet (5,486.4 meters) along the outcrop and to a depth of 300 feet (91.4 meters) (Excursion Guide, 1929). At the same time, a treatment plant with a capacity of 6,000 tons a month was in the process of being constructed here (Wagner, 1973). A mill was also erected during this time. According to a published history of the Johannesburg Consolidated Investment company, the mine appears to have come into production in 1930 (Johannesburg Consolidated Investment, 1965).

On 11 September 1931, a new company by the name of Rustenburg Platinum Mines Limited was registered. It was formed by the amalgamation of Potgietersrust Platinums and the Waterval (Rustenburg) Platinum Mining Company (SA Mining Yearbook, 1941/2). This amalgamated company came about as a result of a decreasing worldwide demand for platinum and the resulting shutting down of the Waterval mine. Due to the continuing slump in the platinum market, all mining operations were halted in April 1932. When the demand for platinum increased again during the early 1950s, the mine opened once more on 1 August 1933 (Johannesburg Consolidated Investment, 1965).

In August 1950, the Rustenburg Platinum Mine took over the Union Platinum Company (Johannesburg Consolidated Investment, 1965). By the 1970s, the Rustenburg Platinum mine was seen as the biggest platinum producer in the world.

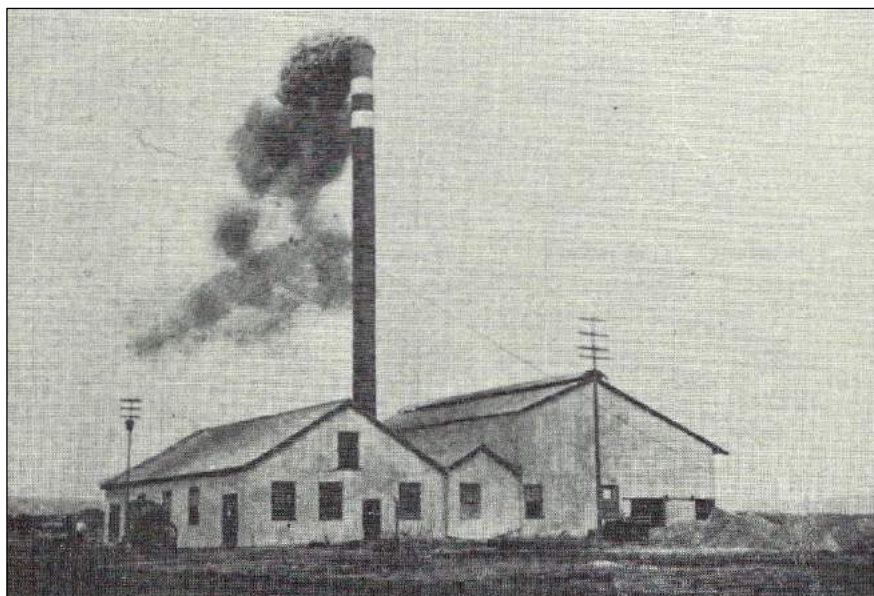


Figure 12 – The power plant at the Kroondal-Klipfontein Mine during the late 1920s (Wagner, 1973:96).

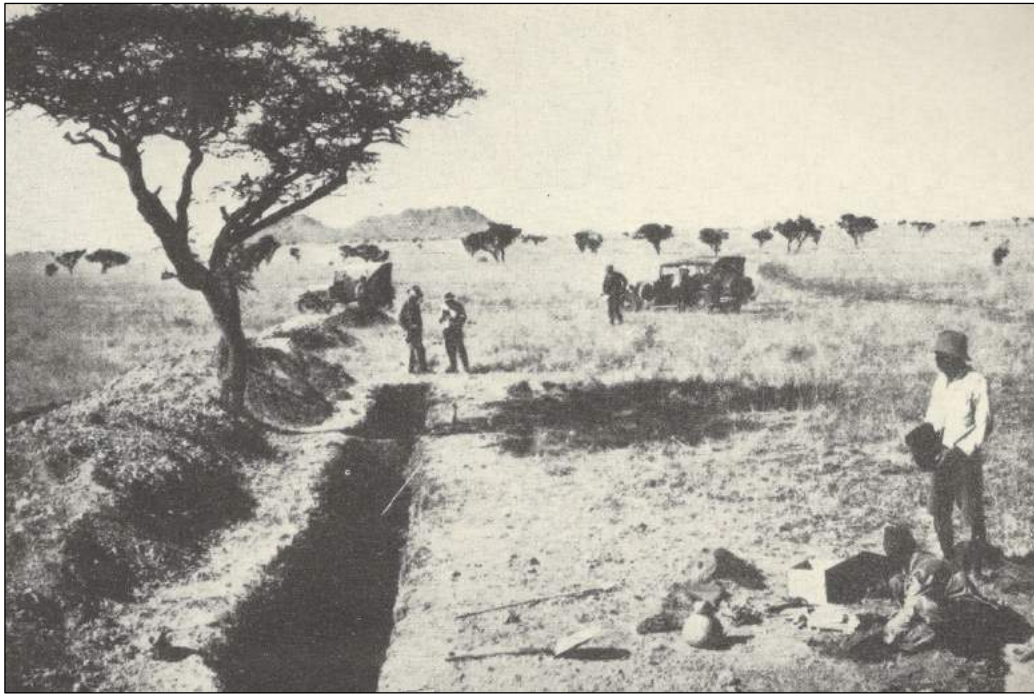


Figure 13 – Early prospecting activities on the farm Swartklip, Rustenburg District. Although this farm is located near present-day Northam, this image provides the viewer with an idea as to what the early history of platinum mining within the study area was like (Wagner, 1973:96).

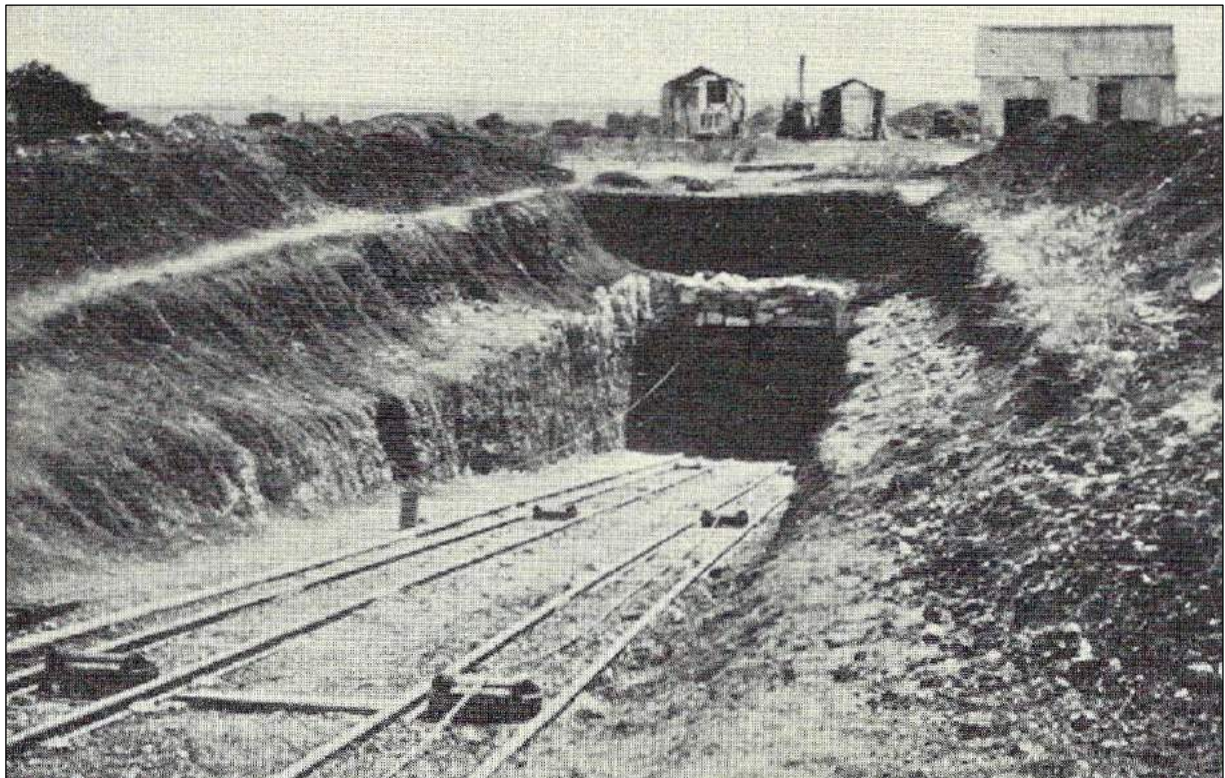


Figure 14 – The Main Western Incline Shaft at the Kroondal-Klipfontein Mine. The photograph was taken during the late 1920s (Wagner, 1973:96).

5.3 Previous Archaeological and Heritage Reports from the Study Area and Surroundings

A number of archaeological and heritage studies have been undertaken within the study area. The reports on these studies were obtained through the South African Heritage Resources Information System (SAHRIS). It must be noted that the list of studies provided here does not necessarily represent all the archaeological and heritage work which have taken place within the study area.

- An HIA study undertaken by PGS Heritage (Pty) Ltd for a Consolidated EIA and EMP for Kroondal And Marikana in 2014 (Birkholtz) identified the three existing buildings at the Central Shaft site (Additional Site 1). This study noted that the Rustenburg Platinum Mines commissioned and completed the Central Deep shaft and associated treatment plant in 1954. The study also noted that “such older mine buildings and structures from this area are not at all common” and gave the site a Generally Protected B (GP.A) or High / Medium Significance, which indicated that the site may not be impacted upon without prior mitigation. It was recommended that the best option for the site was to preserve it *in situ*.
- The archaeological survey undertaken by Dr. Johnny van Schalkwyk of the National Cultural History Museum in 1997 on the farm Kroondal 304 JQ. A total of four sites were identified in the report, all of which are located close to the present study area. These four sites comprise three LIA stonewalled sites and one MSA site (NCHM, 1997).
- The cultural resources survey undertaken by the National Cultural History Museum in 1999 on the farms Spruitfontein 341JQ and Kafferskraal 342JQ. Eight sites were identified and include two unmarked graves (2527CB10 & 2527CB13), three cemeteries (2527CB15, 2527CB16 & 2527CB17), a historic structure (2527CB11), an Iron Age site comprising pottery (2527CB12) and an Iron Age stonewalled site (2527CB14) (NCHM, 1999).
- During 1999 an article was published by Dr. Julius Pistorius of the University of Pretoria with regard to his archaeological excavations and research on a Late Iron Age stonewalled complex comprising three distinct clusters, numbered in his article as KRO001, KRO002 and KRO003. Dr. Pistorius indicated that these “...*settlement clusters reflect the same tripartite division as has been recognised at Molokwane.*” Dr. Pistorius identified the overall stonewalled complex comprising the three clusters as a typical Batswana settlement, and while no direct association with a specific cultural group was found, he suggested that the site was located within the historical sphere of influence of the Bafokeng (Pistorius, 1999).
- The cultural resources survey undertaken by the National Cultural History Museum in 2001 on a section of the farm Kroondal 304JQ. This study was undertaken to identify cultural resources from within the proposed footprint area of a new tailings facility at Kroondal Platinum Mine. No sites were identified (NCHM, 2001).
- During 2002 the National Cultural History Museum was commissioned by Aquarius Platinum to exhume and relocate 23 graves located on the farm Kafferskraal 342JQ that were affected by proposed development at the Marikana Platinum Mine. The exhumations took place on 31

October 2002 (NCHM, 2002). The graves were reburied on Portion 345 of the farm Kafferskraal 342JQ at the following coordinates: S 25° 44' 19.0" E 27° 27' 59.1". This place of reburial is located close to the present study area.

- The archaeological survey undertaken by Professor Tom Huffman of the Rustenburg Platinum Mines Limited Lease Area, and particularly his survey of the Central Deep Railway Line (ARM, 2005). The author identified two sites in proximity to the present study area. Site 5 comprises Iron Age pottery whereas Site 6 comprises Olifantspoort pottery, as well as the poorly preserved remains of farm worker housing.
- The archaeological survey undertaken by Professor Tom Huffman in terms of the Rustenburg Platinum Mines Limited Lease Area, and particularly his survey of the area known as Waterval 2 (ARM, 2005). Professor Tom Huffman identified one site within this area (Site 4) which comprised Iron Age pottery.
- The archaeological survey undertaken by Professor Tom Huffman in terms of the Rustenburg Platinum Mines Limited Lease Area, and particularly his survey of the area known as Brakspruit Option 1 (ARM, 2005). Professor Tom Huffman identified one site within this area which comprised Iron Age pottery and MSA lithics of low to no significance.
- The heritage impact assessment undertaken by Dr. Johnny van Schalkwyk during 2011 on Portion 24 of the farm Spruitfontein 341JQ for the proposed development of a photovoltaic facility. One historic structure of low significance was identified (Van Schalkwyk, 2011a).
- The HIA undertaken by Dr. Johnny van Schalkwyk during 2011 for the proposed amendment to the existing Aquarius Platinum Mine South Africa's Marikana Mine EMPR to include the proposed West-West Open Pit Rehabilitation and Tailings Storage Facility Project. A total of 11 sites were identified including two cemeteries, one farmstead, seven Late Iron Age stonewalled sites and one rock gong (Van Schalkwyk, 2011b).

5.4 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 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 15**).

The relevant topographical map include:

- First Edition of 2527CB Rustenburg Topographic Map 1:50000, surveyed in 1968 and drawn in 1969 by the Trigonometrical Survey Office and published by the Government Printer in 1969.

The map indicates various structures within the study area.

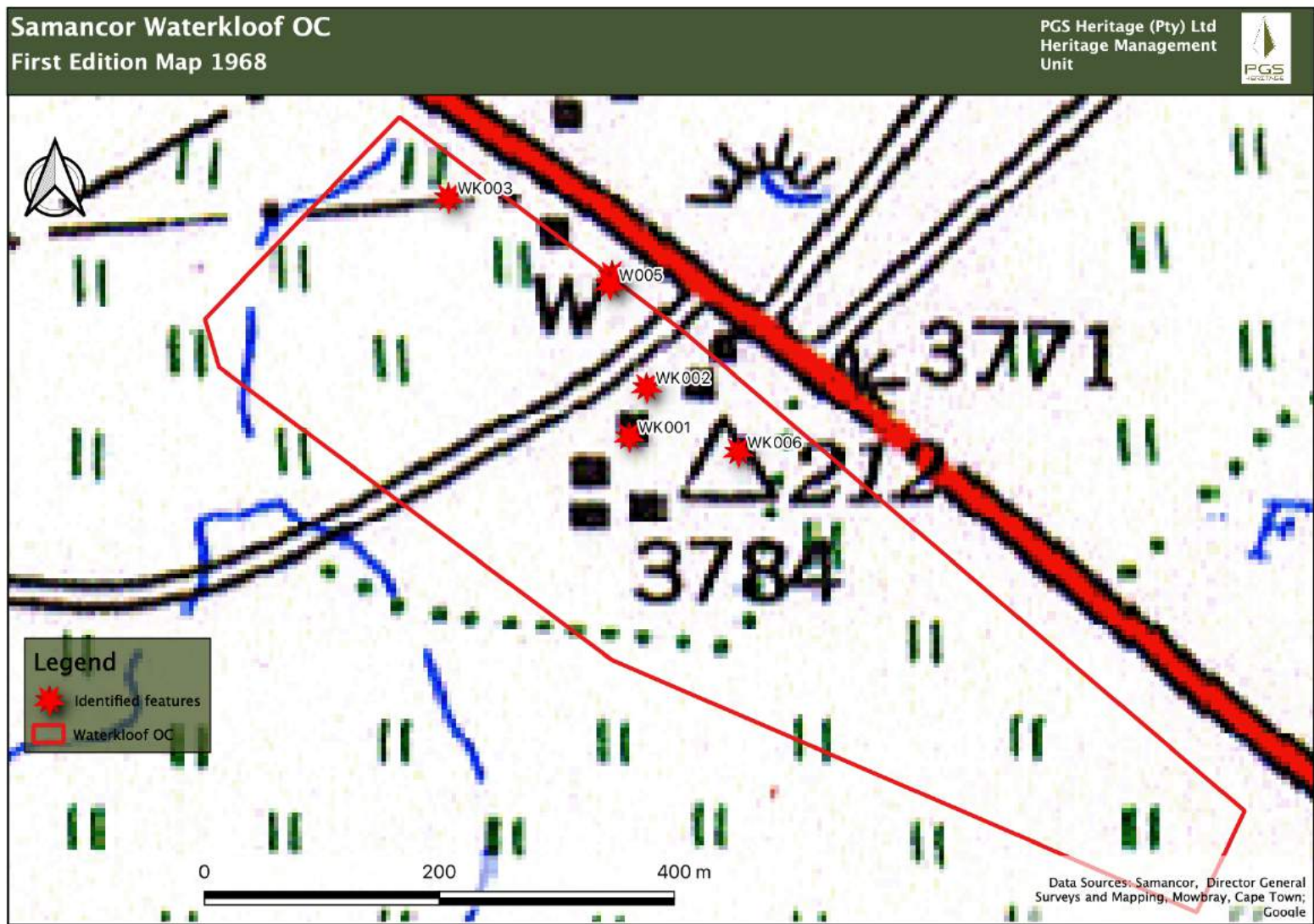


Figure 15 – First Edition of 2527CB Rustenburg Topographic Map 1:50000 dating to 1968, showing the proposed mine area, with several possible heritage features located in the project area. Those sites identified during the fieldwork indicated on the map.

5.5 Findings of the historical desktop study

5.5.1 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 16** and **Figure 17**). According to the Heritage screening report, the project area has a low heritage sensitivity but medium palaeontological sensitivity. The palaeontological sensitivity is addressed in **section 7** of this report.

5.5.2 Heritage Sensitivity

The sensitivity maps were produced by overlying:

- Satellite Imagery;
- Current Topographical Maps; and
- First to third edition Topographical Maps dating from the 1960s.

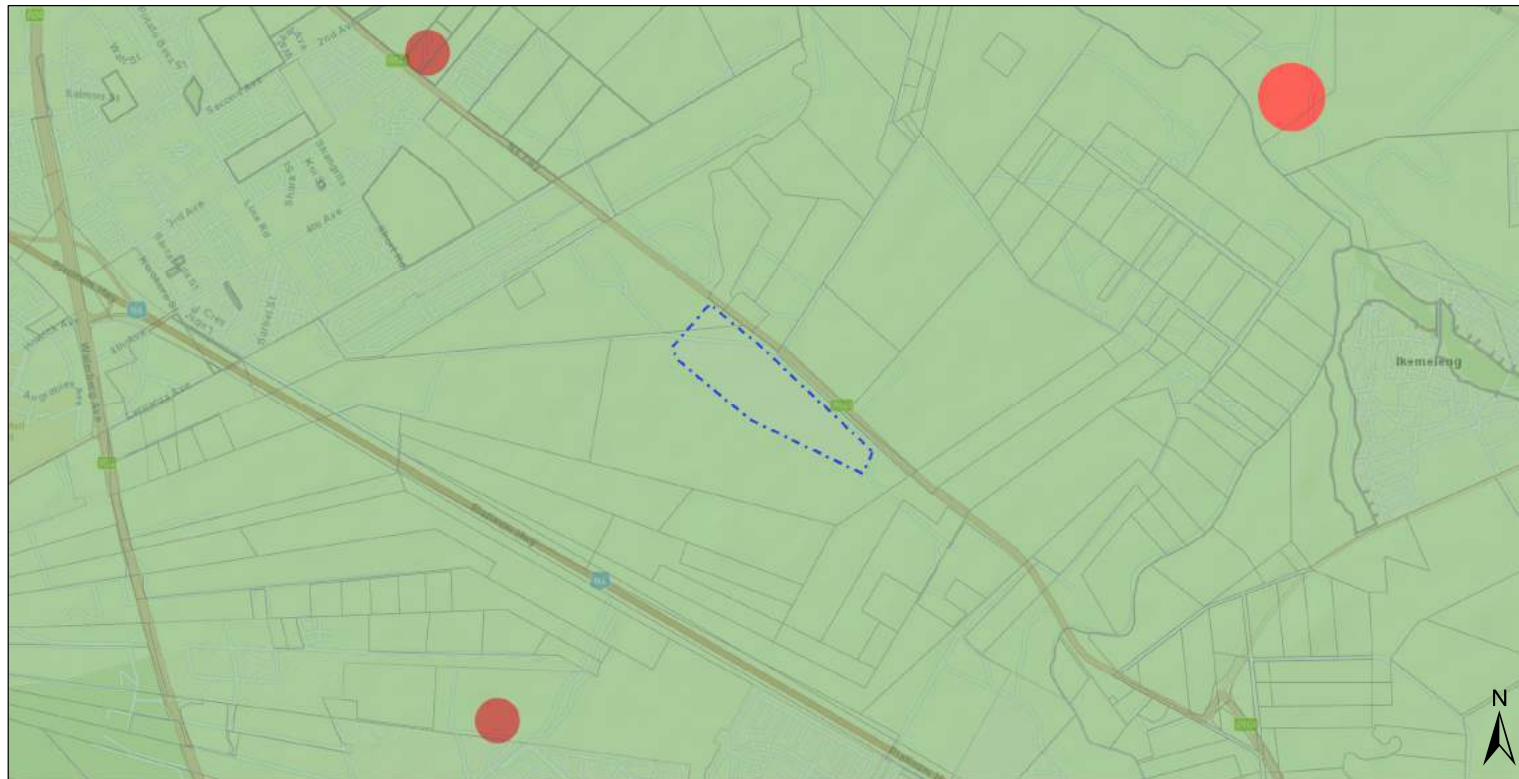
This enabled the identification of possible heritage sensitive areas that included:

- Dwellings;
- Clusters of dwellings (homesteads, huts and farmsteads); 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



2 March 2021

Legend

- | | | | |
|---------------------------------------|------------------|--|-----------|
| Site Area | Cadastral | Public Place | |
| EIA Application Development Footprint | Erven | Archaeological and Cultural Heritage Combined Sensitivity | |
| EIA Application Site | Farm Portion | | Very High |
| National Jurisdiction Area | Farm | | High |
| | Agri Holding | | Low |

0 0.75 1.5 km
 Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community














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 National Department of Environmental Affairs,
 Government of South Africa.

Figure 16 – Archaeological and Cultural Heritage Combined Screening map. Source: Department of Environmental Affairs



2 March 2021

Legend

- | | | | |
|---|--|--|---|
|  Site Area | Cadastre |  Public Place |  Low |
|  EIA Application Development Footprint |  Erven | Paleontology Combined Sensitivity | |
|  EIA Application Site |  Farm Portion |  Very High | |
|  National Jurisdiction Area |  Farm |  High | |
| |  Agri Holding |  Medium | |

0 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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Figure 17 – Palaeontology Combined Screening map. Source: Department of Environmental Affairs

6 FIELDWORK AND FINDINGS

A controlled surface survey was conducted on foot on **22 January 2021** by two archaeologist and heritage specialists from PGS. The tracklogs (in red) for the survey are indicated in **Figure 18**.

During the survey 2 areas with multiple foundations and broken-down buildings were identified. The first area (**WK001** and **WK002**) towards the central section of the project area consisted of two buildings of which only the walls remained and a series of small foundations and piles of building rubble.

The second area (**WK003**) is situated on the northwestern corner of the project area and consists of multiple small foundation remnants and a series of tall trees.

The structured marked by **WK002** is much older than the other structures.

Local residents also identified the location of two possible graves (**WK004 and 5**) and a burial ground at **WK006**.

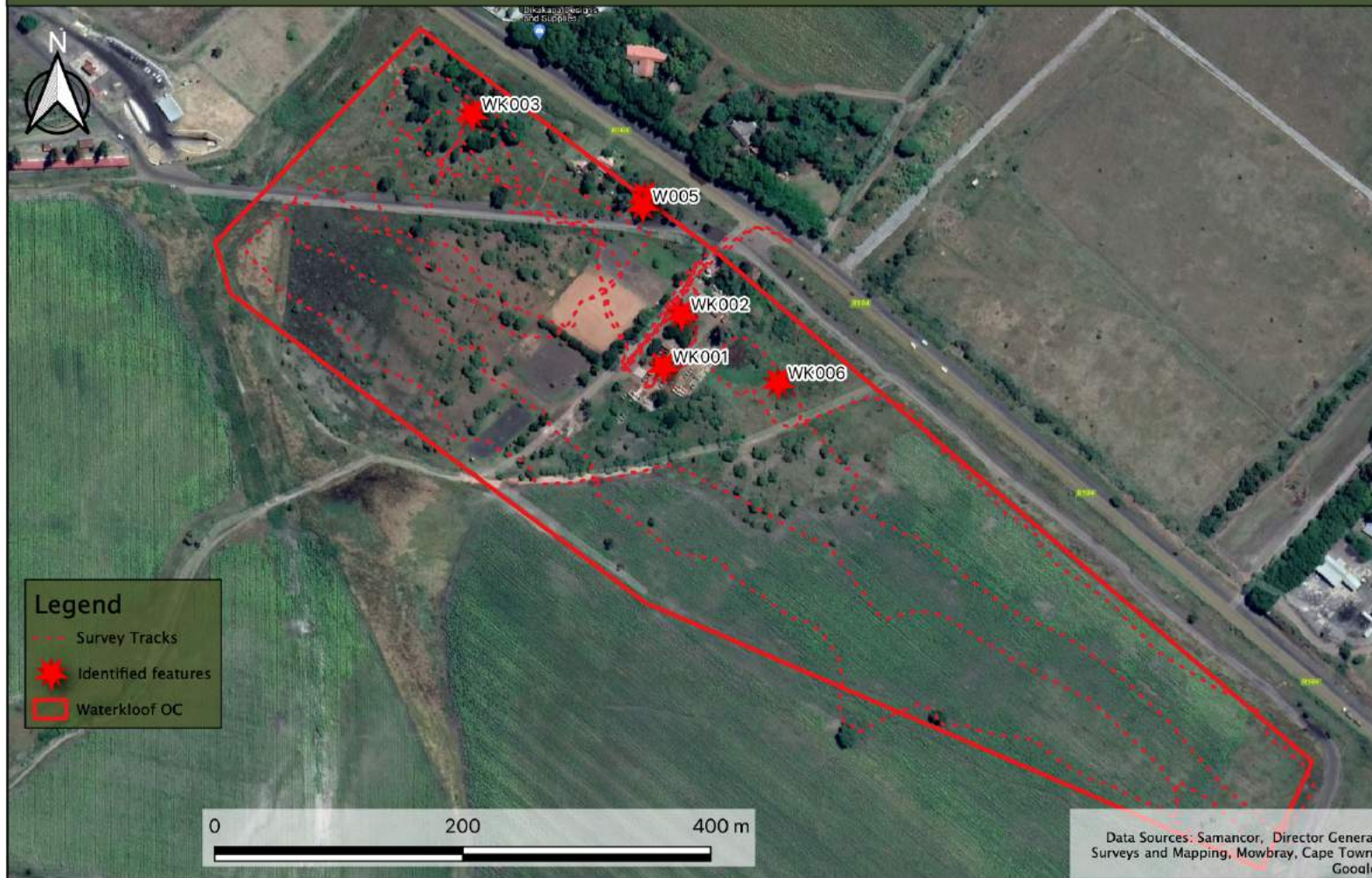



Figure 18 – Locality of the identified structures and fieldwork logs

Table 7 - Sites identified during the heritage survey

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
WK001	25°42'16,99"S	27°17'5,55"E	Series of broken-down structures and piles of building rubble. These structures were possibly part of a small business revolving around equestrian activities.	Low Significance	NCW



Figure 19 – WK001 View of broken-down structures and piles of building rubble.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
 <p data-bbox="725 663 1536 692"><i>Figure 20 – Alternate views of the series of remnants around WK001</i></p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
WK002	25°42'15,48"S	27° 17'6,08"E	<p>Location of a structure that has been partially broken down and derelict. The materials used for construction consist of fired clay bricks and mortar. Later additions are evident as indicated with a change in the type of bricks utilised.</p> <p>Although the structure may be older than 60 years it has no heritage value as most of the indicative building materials are removed.</p> <p>No further mitigation or management measures before destruction will be needed.</p>	Low Significance	NCW



Figure 21 - View of the western facing wall.

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
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Figure 22 – Alternate views of structure at WK002

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
WK003	25°42'9,70"S	27°17'0,03"E	Foundation located on the northwestern corner of the project area.	Low Significance	NCW



Figure 23 – Foundation located at WK003

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
<p>Figure 24 – Alternate view of WK003</p>					

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
WK004 WK005	25° 42' 12.1"S 25° 42' 12.3"S	27° 17' 05.0"E 27° 17' 05.0"E	Two possible graves were identified by local residents during site clearing for the mining project. The two structures were demarcated with barrier tape.	High	IIIA


Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					

Figure 25 – demarcated structures at WK004

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					

Figure 26 – Alternate view of WK004 and Wk005

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
WK006	25° 42' 17.5" S	27° 17' 08.9"E	A burial ground was. Identified by local residents within the proposed mining area. The area is extremely overgrown and only two of. The grave could be clearly photographed	Low Significance	NCW

Site number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
<p><i>Figure 27 – Two of the grave in the burial ground at WK006</i></p>					

6.1 Sensitivity assessment outcome

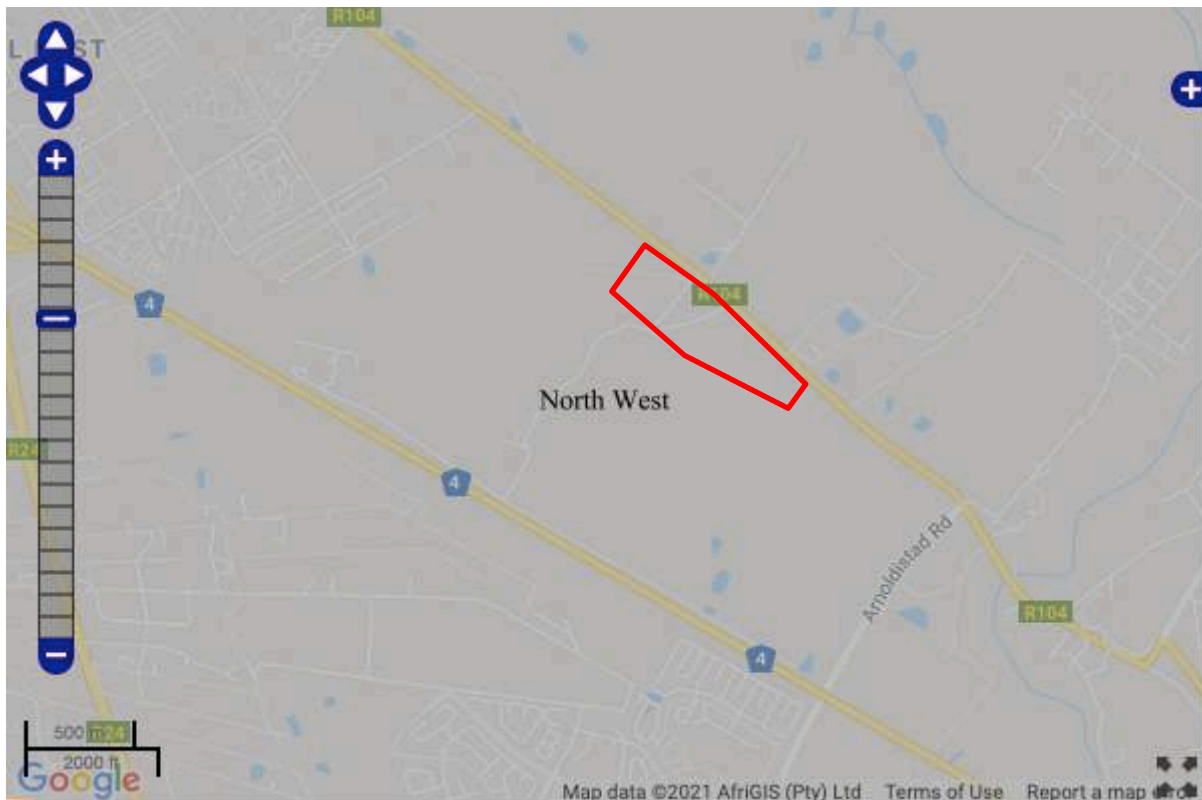
From the desktop assessment high to low heritage sensitive areas were identified. Many of the heritage sensitive areas identified during the desktop search consisted of old structures.

During the survey, 6 possible sensitive heritage features were identified. The possible graves at WK004 and WK005 and the burial ground at WK006 are of high heritage significance.

7 PALAEOLOGY

Although the environmental Screening tool attributes a medium palaeontological sensitivity note in section 5.5.1 and analysis according to the detailed PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the proposed area of the project footprint occurs (Figure 28) is insignificant.

No further palaeontological studies are thus required.



*Figure 28 - Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences).
Approximate location of the proposed development is indicated in red*

8 IMPACT ASSESSMENT

The impact significance rating process serves two purposes: firstly, it helps to highlight the critical impacts requiring consideration in the management and approval process; secondly, it shows the primary impact characteristics, as defined above, used to evaluate impact significance.

The impacts will be ranked according to the methodology described below. Where possible, mitigation measures will be provided to manage impacts. In order to ensure uniformity, a standard impact assessment methodology will be utilised so that a wide range of impacts can be compared with each other. The impact assessment methodology makes provision for the assessment of impacts against the following criteria:

- Significance;
- Spatial scale;
- Temporal scale;
- Probability; and
- Degree of certainty.

A combined quantitative and qualitative methodology was used to describe impacts for each of the aforementioned assessment criteria. A summary of each of the qualitative descriptors along with the equivalent quantitative rating scale for each of the aforementioned criteria is given in **Table 8**.

Table 8 - Quantitative rating and equivalent descriptors for the impact assessment criteria

RATING	SIGNIFICANCE	EXTENT SCALE	TEMPORAL SCALE
1	VERY LOW	Proposed site	Incidental
2	LOW	Study area	Short-term
3	MODERATE	Local	Medium/High-term
4	HIGH	Regional / Provincial	Long-term
5	VERY HIGH	Global / National	Permanent

A more detailed description of each of the assessment criteria is given in the following sections.

8.1 Significance Assessment

Significance rating (importance) of the associated impacts embraces the notion of extent and magnitude but does not always clearly define these since their importance in the rating scale is very relative. For example, the magnitude (i.e., the size) of area affected by atmospheric pollution may be extremely large (1 000 km²) but the significance of this effect is dependent on the concentration or level of pollution. If the concentration is great, the significance of the impact would be HIGH or VERY HIGH, but if it is diluted it would be VERY LOW or LOW. Similarly, if 60 ha of a grassland type are destroyed the impact would be VERY HIGH if only 100 ha of that grassland type

were known. The impact would be VERY LOW if the grassland type was common. A more detailed description of the impact significance rating scale is given in **Table 9** below.

Table 9 - Description of the significance rating scale

RATING		DESCRIPTION
5	Very high	Of the highest order possible within the bounds of impacts which could occur. In the case of adverse impacts: there is no possible mitigation and/or remedial activity which could offset the impact. In the case of beneficial impacts, there is no real alternative to achieving this benefit.
4	High	Impact is of substantial order within the bounds of impacts, which could occur. In the case of adverse impacts: mitigation and/or remedial activity is feasible but difficult, expensive, time-consuming or some combination of these. In the case of beneficial impacts, other means of achieving this benefit are feasible but they are more difficult, expensive, time-consuming or some combination of these.
3	Moderate	Impact is real but not substantial in relation to other impacts, which might take effect within the bounds of those which could occur. In the case of adverse impacts: mitigation and/or remedial activity are both feasible and fairly easily possible. In the case of beneficial impacts: other means of achieving this benefit are about equal in time, cost, effort, etc.
2	Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts: mitigation and/or remedial activity is either easily achieved or little will be required, or both. In the case of beneficial impacts, alternative means for achieving this benefit are likely to be easier, cheaper, more effective, less time consuming, or some combination of these.
1	Very low	Impact is negligible within the bounds of impacts which could occur. In the case of adverse impacts, almost no mitigation and/or remedial activity are needed, and any minor steps which might be needed are easy, cheap, and simple. In the case of beneficial impacts, alternative means are almost all likely to be better, in one or a number of ways, than this means of achieving the benefit. Three additional categories must also be used where relevant. They are in addition to the category represented on the scale, and if used, will replace the scale.
0	No impact	There is no impact at all - not even a very low impact on a party or system.

8.2 Spatial Scale

The spatial scale refers to the extent of the impact i.e., will the impact be felt at the local, regional, or global scale. The spatial assessment scale is described in more detail in **Table 10**.

Table 10 - Description of the significance rating scale

RATING		DESCRIPTION
5	Global/National	The maximum extent of any impact.
4	Regional/Provincial	The spatial scale is moderate within the bounds of impacts possible and will be felt at a regional scale (District Municipality to Provincial Level).
3	Local	The impact will affect an area up to 10 km from the proposed site.
2	Study Site	The impact will affect an area not exceeding the Eskom property.
1	Proposed site	The impact will affect an area no bigger than the ash disposal site.

8.3 Duration Scale

In order to accurately describe the impact, it is necessary to understand the duration and persistence of an impact in the environment. The temporal scale is rated according to criteria set out in **Table 11**.

Table 11 - Description of the temporal rating scale

RATING		DESCRIPTION
1	Incidental	The impact will be limited to isolated incidences that are expected to occur very sporadically.
2	Short-term	The environmental impact identified will operate for the duration of the construction phase or a period of less than 5 years, whichever is the greater.
3	Medium/High term	The environmental impact identified will operate for the duration of life of facility.
4	Long term	The environmental impact identified will operate beyond the life of operation.
5	Permanent	The environmental impact will be permanent.

8.4 Degree of Probability

*Probability or likelihood of an impact occurring will be described as shown in **Table 12***

Table 12 below.

Table 12 - Description of the degree of probability of an impact occurring

RATING	DESCRIPTION
1	Practically impossible
2	Unlikely
3	Could happen
4	Very Likely
5	It's going to happen / has occurred

8.5 Degree of Certainty

As with all studies it is not possible to be 100% certain of all facts, and for this reason a standard “degree of certainty” scale is used as discussed in **Table 13**. The level of detail for specialist studies is determined according to the degree of certainty required for decision-making. The impacts are discussed in terms of affected parties or environmental components.

Table 13 - Description of the degree of certainty rating scale

RATING	DESCRIPTION
Definite	More than 90% sure of a particular fact.
Probable	Between 70 and 90% sure of a particular fact, or of the likelihood of that impact occurring.
Possible	Between 40 and 70% sure of a particular fact or of the likelihood of an impact occurring.
Unsure	Less than 40% sure of a particular fact or the likelihood of an impact occurring.
Can't know	The consultant believes an assessment is not possible even with additional research.

Don't know	The consultant cannot, or is unwilling, to make an assessment given available information.
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8.6 Quantitative Description of Impacts

To allow for impacts to be described in a quantitative manner in addition to the qualitative description given above, a rating scale of between 1 and 5 was used for each of the assessment criteria. Thus, the total value of the impact is described as the function of significance, spatial and temporal scale as described below:

$$\text{Impact Risk} = \frac{(\text{SIGNIFICANCE} + \text{Spatial} + \text{Temporal}) \times \text{Probability}}{3 \quad \quad \quad 5}$$

An example of how this rating scale is applied is shown in **Table 14**.

Table 14 - Example of Rating Scale

Impact	Significance	Spatial Scale	Temporal Scale	Probability	Rating
	LOW	Local	Medium/High-term	Could Happen	
Impact to air	2	3	3	3	1.6

Note: The significance, spatial and temporal scales are added to give a total of 8, that is divided by 3 to give a criteria rating of 2,67. The probability (3) is divided by 5 to give a probability rating of 0,6. The criteria rating of 2,67 is then multiplied by the probability rating (0,6) to give the final rating of 1,6.

The impact risk is classified according to five classes as described in the **Table 15** below.

Table 15 - Impact Risk Classes

RATING	IMPACT CLASS	DESCRIPTION
0.1 – 1.0	1	Very Low
1.1 – 2.0	2	Low
2.1 – 3.0	3	Moderate
3.1 – 4.0	4	High
4.1 – 5.0	5	Very High

Therefore, with reference to the example used for air quality above, an impact rating of 1.6 will fall in the Impact Class 2, which will be considered to be a low impact.

8.7 Heritage Impacts

During the survey 3 areas with multiple foundations and broken-down buildings were identified. None of the structure had any heritage value and thus **not conservation worthy**.

The palaeontological sensitivity of the area is also rated as insignificant.

8.8 Impact Assessment Table

Table 16 - Impact Assessment Table

IMPACT	IMPACT DIRECTION	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
Structures	Negative	NO IMPACT	Isolated Sites / proposed site	Permanent	It's going to happen	
	-	0	1	5	5	2,00
Palaeontological resources	Negative	NO IMPACT	Isolated Sites / proposed site	Incidental	It's going to happen / has occurred	
	-	0	1	1	5	0,67
Palaeontological resources	Negative	VERY HIGH	Study Area	Permanent	It's going to happen / has occurred	
	-	5	2	5	5	4,00

8.9 Management recommendations and guidelines

8.9.1 Construction phase

The project will encompass a range of activities during the construction phase and mining phase, including ground clearance, 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 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.

8.9.2 Chance find procedure

- A heritage practitioner / archaeologist should be appointed to develop a heritage induction program and conduct training for the ECO as well as team leaders in the identification of heritage resources and artefacts.
- An appropriately qualified heritage 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 extent and importance of 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.

8.9.3 Possible finds during construction and operation (mining activities)

The study area occurs within a greater historical and 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:

- unmarked graves

8.10 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 17** gives guidelines for lead times on permitting.

Table 17 - 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

8.11 Heritage Management Plan for EMPr implementation

Table 18 - 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
Possible graves (WK004 and 5) and the burial ground (WK006)	<p>The site should be demarcated with a 100-meter buffer as per SAHRA policy and the grave should be avoided if any construction is to happen close to it.</p> <p>If not possible the graves must be relocated through a detailed grave relocation process as required by the NHRA and National Health Act</p>	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

9 CONCLUSIONS

During the survey 2 areas with multiple foundations and broken-down buildings were identified. The first area (**WK001** and **WK002**) towards the central section of the project area consisted of two buildings of which only the walls remained and a series of small foundations and piles of building rubble.

The second area (**WK003**) is situated on the northwestern corner of the project area and consists of multiple small foundation remnants and a series of tall trees.

None of the structure had any heritage value and thus **not conservation worthy**.

Local residents also identified the location of two possible graves (**WK004** and **5**) and a burial ground at **WK006** that have a high heritage significance.

The palaeontological sensitivity of the area is also rated as insignificant.

Refer to the mitigation measures as indicate in **Table 18**.

9.1 General

It is the author's considered opinion that overall impact on heritage resources is Very 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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10.3 Archival References

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10.4 Historical Aerial Photographs

All the historic aerial photographs 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.

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10.5 Internet

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10.6 Google Earth

At least some of the aerial depictions of the study area were obtained using Google Earth.

Appendix A
Project team CV's

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*

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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