WEST WITS MINING MLI (PTY) LTD, ROODEPOORT, JOHANNESBURG METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE

Mining Permit Application: Proposed Kimberley West Opencast Pit

Heritage Impact Assessment

Issue Date:	**11 May 2018**
Revision No.:	**0**
PGS Project No.:	**298 HIA**
Client	**Malan Scholes Consulting**

PGS HERITAGE

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Declaration of Independence

- I, Jennifer Kitto, 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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CONTACT PERSON: Jennifer Kitto – Heritage Specialist

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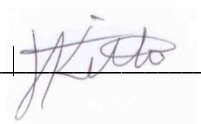
SIGNATURE: 

ACKNOWLEDGEMENT OF RECEIPT

Report Title	**Heritage Impact Assessment - Mining Permit Application: West Wits Mining MLI (Pty) Ltd – Proposed Opencast Pit: Kimberley West, Roodepoort, Johannesburg Metropolitan Municipality, Gauteng**		
Control	**Name**	**Signature**	**Designation**
Author	J Kitto		**Heritage Specialist - PGS Heritage**
Reviewed	W Fourie		**Principal Heritage Specialist**

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The heritage impact assessment report has been compiled taking into account the NEMA Appendix 6 requirements for specialist reports as indicated in the table below.

NEMA Regs (2014) - Appendix 6	Relevant section in report
Details of the specialist who prepared the report	Page ii of Report – Contact details and company
The expertise of that person to compile a specialist report including a curriculum vita	Section 1.2 – refer to **Appendix D**
A declaration that the person is independent in a form as may be specified by the competent authority	Page ii of the report
An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1
The date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 6
A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 3.1 and **Appendix B and Appendix C**
The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	Section 3 and 4.2
An identification of any areas to be avoided, including buffers	N/A
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;	No sensitive areas identified, refer to Figure 13
A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.3
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 5.1
Any mitigation measures for inclusion in the EMPr	Section 8 and 9
Any conditions for inclusion in the environmental authorisation	N/A
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 8 and 9
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised and	Section 8 and 9
If the opinion is that the proposed activity 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	
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 BAR process.
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.
Any other information requested by the competent authority.	Not applicable.

EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd was appointed by Malan Scholes Consulting to undertake a Heritage Impact Assessment (HIA) that forms part of the Basic Assessment Reporting process (BAR) for the mining permit application for the proposed opencast pit referred to as Kimberley West, will be located on a Portion of Portion 1 of the Farm Witpoortjie 245 IQ, a Portion of the Remainder of Portion 14 of the Farm Roodepoort 237 IQ, a portion of the waste rock dump will be located on a Portion of Portion 92 of the Farm Vlakfontein 238 IQ and a section of the access/haul road will be located on the Remainder of Potion 1 of the Farm Vlakfontein 238 IQ, Roodepoort Local Municipality, Gauteng Province.

The archival and historical research has revealed that the entire area of the farms Witpoortjie 245 IQ, Roodepoort 237 IQ and Vlakfontein 238IQ, on which the proposed Kimberley West opencast mining footprint is situated, has been affected on a continual basis by historical mining activities. These mining activities have continued to the present day, both formally and informally (illegal). The ground affected by the Kimberley West opencast footprint is therefore extremely disturbed.

The fieldwork findings confirmed that there are no identified heritage resources situated inside or adjacent to the Kimberley West foot print area. Since no heritage resources were identified within the Kimberley West opencast footprint area, the overall impact of the development on heritage resources is regarded as VERY LOW and no mitigation measures are required.

In Palaeontological terms the significance is rated as Low negative. The proposed development is thus unlikely to pose a substantial threat to local fossil heritage. However, should fossil remains be discovered during any phase of construction, either on the surface or exposed by fresh excavations, the ECO responsible for these developments should be alerted immediately. Such discoveries ought to be protected (preferably in situ) and the ECO should alert SAHRA (South African Heritage Research Agency) so that appropriate mitigation (e.g. recording, sampling or collection) can be taken by a professional palaeontologist.

It is my considered opinion that, based on the findings of the desktop research together with the fieldwork findings, the overall impact on heritage resources is acceptably low and the project can be approved from a heritage perspective.

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TERMINOLOGY AND ABBREVIATIONS

Archaeological resources

This includes:

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

Cultural significance

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

Development

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

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

Early Stone Age

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

Fossil

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

Heritage

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

Heritage resources

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

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, and
- sites of significance relating to the history of slavery in South Africa;

Holocene

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

Late Stone Age

The archaeology of the last 40 000 years associated with fully modern people.

Late Iron Age (Early Farming Communities)

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

Middle Stone Age

The archaeology of the Stone Age between 40 000-300 000 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.

ACRONYMS	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
BAR	Basic Assessment Reporting process
CBD	Central Business District
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
ECO	Environmental Control Officer
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age

NEMA	National Environmental Management Act
NEMAWA	National Environmental Management: Waste Act (No. 59 of 2008)
NHRA	National Heritage Resources Act (No 25 of 1999)
NWA	National Water Act (36 of 1998)
PGS	PGS Heritage
PHRA	Provincial Heritage Resources Authority
PSSA	Palaeontological Society of South Africa
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAPS	South African Police Services
ZAR	Zuid-Afrikaansche Republiek

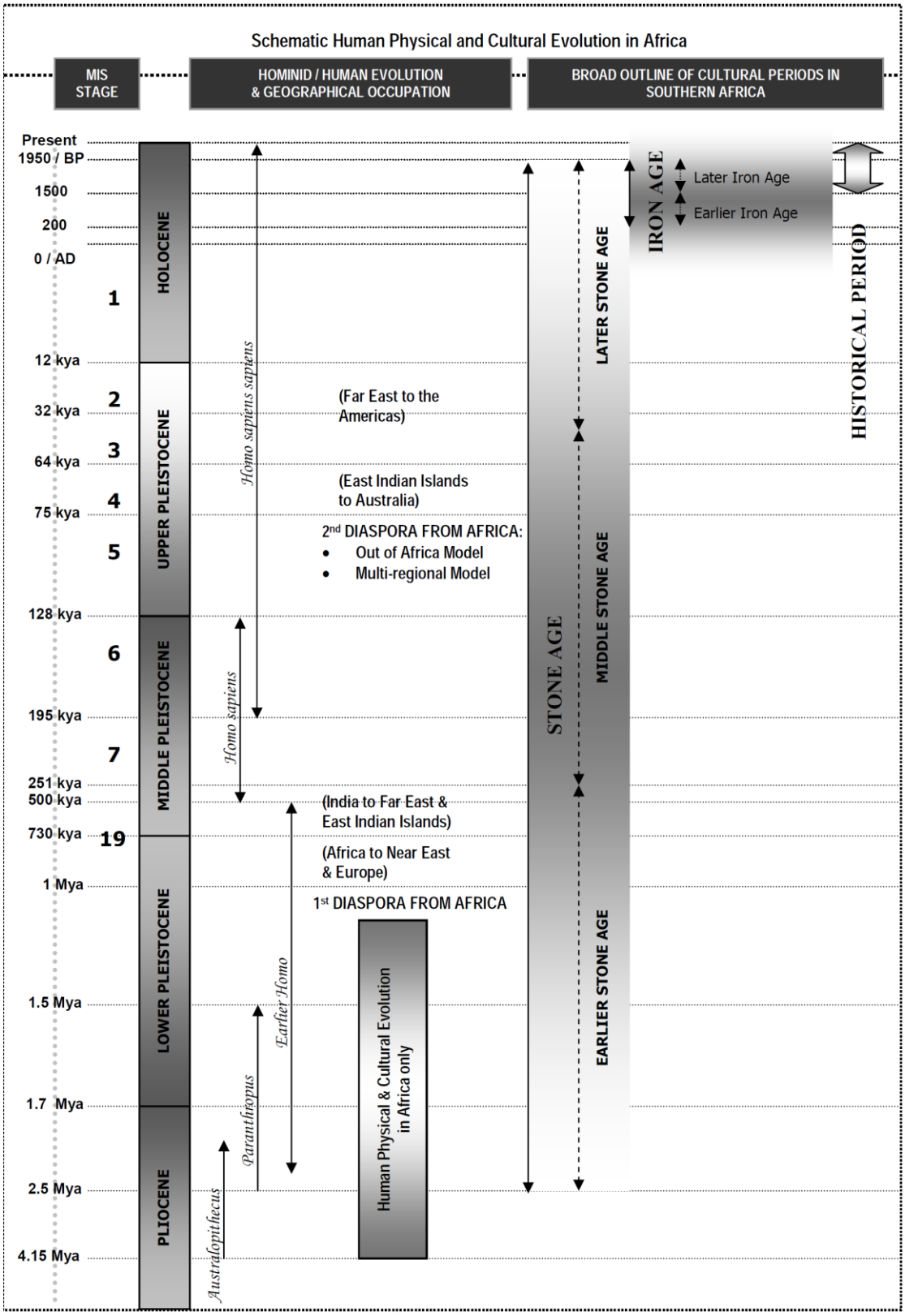

Figure 1 – Human and Cultural Time line in Africa (Morris, 2008)

1 INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) was appointed by Malan Scholes Consulting to undertake a Heritage Impact Assessment (HIA) that forms part of the Basic Assessment Reporting process (BAR) for the mining permit application for the proposed opencast pit referred to as Kimberley West, will be located on a Portion of Portion 1 of the Farm Witpoortjie 245 IQ, a Portion of the Remainder of Portion 14 of the Farm Roodepoort 237 IQ, a portion of the waste rock dump will be located on a Portion of Portion 92 of the Farm Vlakfontein 238 IQ and a section of the access/haul road will be located on the Remainder of Potion 1 of the Farm Vlakfontein 238 IQ, Roodepoort Local Municipality, Johannesburg Metropolitan Municipality, Gauteng Province.

1.1 Scope of the Study

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

The scope of work for the Heritage Impact Assessment Phase of the project can be itemised as follows:

- A detailed HIA based on the proposed activities. Impacts must be calculated for each phase of the project and these phases shall be classified as:
  - Planning and Design;
  - Construction;
  - Operation;
  - Decommissioning;
  - Rehabilitation and Closure.
- Identification and description of site sensitivities (if none, motivate why not);
- Identification and description of site constraints (if none, motivate why not);
- Identified potential impacts must be evaluated in accordance with the agreed methodology to determine significance. Identified potential impacts (cumulative, direct

and indirect) must be quantified (where possible) and fully described for each feasible alternative utilising the Impact Assessment template provided.

- Residual and latent impacts after mitigation must be evaluated (in accordance with the assessment methodology described above) that actual implemented results can be measured against those predicted;
- Each specialist will be required to contribute to the preparation of a detailed site specific EMP relating to the specific field of expertise and impacts identified;
- Provide detailed mitigation / management measures for the management of the identified impacts for inclusion in the EMP. The mitigation / management measures must be presented in a tabulated format for each phase of the project and must include:
    - Detailed description of mitigation measures or management options;
    - Roles and Responsibilities for Implementation;
    - Timeframes for implementation;
    - Means of measuring successful implementation (Targets & Performance Indicators).
- Compilation of an Action Plan for Implementation of the recommended mitigation measures. This plan must, at a minimum, include the following:
    - Management Actions for Implementation;
    - Responsibilities for Implementation, Monitoring and Review;
    - Timeframes for implementation;
    - Means of measuring successful implementation (Targets & Performance Indicators).
- Any other Recommendations;
- Identify any gaps in knowledge, data or information;
    - Report on the adequacy of predictive methods utilised
    - Report on the adequacy of underlying assumptions;
    - Report on uncertainties in the information provided.

1.2 Specialist Qualifications

This HIA Report was compiled by PGS.

The staff at PGS has a combined experience of nearly 40 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

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

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

Ilan Smeyatsky, field archaeologist, holds a Master's degree in Archaeology and is registered as a Professional Archaeologist with the ASAPA.

1.3 Assumptions and Limitations

Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and the current dense vegetation cover. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted.

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

Please note that the field survey for this project was constrained by security issues related to illegal mining activity in the footprint area as well as obscured visibility due to some areas of dense vegetation and extensive dumping.

1.4 Legislative Context

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

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

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

- National Environmental Management Act (NEMA) Act 107 of 1998
    - Basic Environmental Assessment (BEA) – Section (23)(2)(d)
    - Environmental Scoping Report (ESR) – Section (29)(1)(d)
    - Environmental Impact Assessment (EIA) – Section (32)(2)(d)
    - Environmental Management Plan (EMP) – Section (34)(b)
- National Heritage Resources Act (NHRA) Act 25 of 1999
    - Protection of Heritage Resources – Sections 34 to 36; and
    - Heritage Resources Management – Section 38
- Mineral and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
    - Section 39(3)

The NHRA stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34(1) of the NHRA states that, “no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…” The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of 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.

The NHRA stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Sections 34-36 provides general protection to heritage resources such as structures older than 60 years, archaeological and palaeontological resources and burial grounds and graves.

The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and, in the case of CRM, those resources specifically impacted on by development as stipulated in Section 38(1) of NHRA, and those developments administered through NEMA and MPRDA legislation (s38(8)). In the latter cases, the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorizations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impacts Processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage (Fourie, 2008).

The NEMA 23(2)(b) states that an integrated environmental management plan should, "…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage".

A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements in the NEMA reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down in Section 33 of the regulations (Fourie, 2008).

1.5 International Requirements

The regulatory aspects dealt with above relate solely to the in-house South African laws and regulations and would usually be the only requirements for an application for a Mining Right. However, it may be that international financing is required for a large-scale project, in which case Project Finance Advisory Services, Project Finance, Project-Related Corporate Loans or Bridging Loans may be required. In such a case, the applicant for international financing will need to comply

with the requirements of the International Finance Corporation (IFC) Performance Standards and the Equator Principles observed by most large international financial institutions. Summaries of these requirements are set out below.

i. The International Finance Corporation

The IFC Performance Standards are an international benchmark for identifying and managing environmental and social risk and have been adopted by many organizations as a key component of their environmental and social risk management. The IFC's Environmental, Health, and Safety (EHS) Guidelines provide technical guidelines with general and industry-specific examples of good international industry practice to meet the IFC's Performance Standards (PS).

In many countries, the scope and intent of the IFC Performance Standards is addressed or partially addressed in the country's environmental and social regulatory framework. The IFC Performance Standards encompass eight topics of which PS 7 and PS 8 have direct relevance to heritage resources:

i. PS 1 - Environmental and Social Assessment and Management System;
ii. PS 2 - Labour and Working Conditions;
iii. PS 3 - Pollution Prevention and Abatement;
iv. PS 4 - Community Health, Safety and Security;
v. PS 5 - Land Acquisition and Involuntary Resettlement;
vi. PS 6 - Biodiversity Conservation and Sustainable Natural Resource Management;
vii. PS 7 - Indigenous Peoples;
viii. PS 8 - Cultural Heritage

Table 1 provides a listing of the relevant sections pertaining to cultural heritage.

Table 1 :Sections of IFC Standards relevant to heritage resources and their management

GUIDELINE	RELEVANT CHAPTER	DESCRIPTION OF THE REQUIREMENT
International Finance Corporations (IFC) Performance Standard	Standard (PS) 5 – Paragraph 3	Minimization and avoidance of impacts from project related activities.
	Standard (PS) 5 – Paragraph 10 (Community Engagement) (2012).	Engagement with affected communities and the disclosure of relevant information of the relocation process.
	Standard (PS) 5 – Paragraph 20	Respecting the social and cultural institutions of the displaced persons and any host communities.
	Standard (PS) 8 – Paragraph 9 (Consultation) (2012).	The need for consultation with affected communities to identify cultural heritage of importance and involve affected communities and involve the relevant national or local regulatory authorities in the decision-making processes.
	Standard (PS) 8 – Paragraph 12 (Removal of Non-Replicable Cultural Heritage) (2012).	The removal of cultural heritage must only be considered when no other alternative is available.

The IFC's Performance Standards offer a framework for understanding and managing environmental and social risks for high profile, complex, international or potentially high impact projects. The financial institution is required to verify, as part of its environmental and social due diligence process, that the commercial client/investee complies with the IFC Performance Standards. To do so, the financial institution needs to be knowledgeable about the environmental and social laws of the country in which it operates and compare these regulatory requirements against those of the IFC Performance Standards to identify gaps. A good understanding of both sets of requirements, as well as potential gaps, ensures that the financial institution will effectively

identify and assess the key environmental and social risks and impacts that might be associated with a financial transaction.

If non-compliances with the IFC Performance Standards are identified, and depending on the severity of the issue, the financial institution can require the commercial client/investee to develop a corrective action plan for addressing the issue within a reasonable timeframe and stipulate this as a condition of the financial transaction with the commercial client/investee.

The IFC Performance Standards help the IFC and its clients to manage and improve their environmental and social performance through an outcomes-based approach and provide a solid base from which clients may increase the sustainability of their business operations. The desired outcomes are described in the objectives of each Performance Standard, followed by specific requirements to help clients achieve these outcomes through means that are appropriate to the nature and scale of the project and commensurate with the level of environmental and social risks (likelihood of harm) and impacts.

ii. Equator Principles

The Equator Principles (EP) is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

The EP apply globally, to all industry sectors and to four financial products –

1) Project Finance Advisory Services;
2) Project Finance;
3) Project-Related Corporate Loans; and
4) Bridge Loans. The relevant thresholds and criteria for applications are described in detail in the Scope section of the EP.

Equator Principles Financial Institutions (EPFI) commit to implementing the EP in their internal environmental and social policies, procedures and standards for financing projects and will not provide Project Finance or Project-Related Corporate Loans to projects where the client will not, or is unable to, comply with the EP.

The EP have greatly increased the attention and focus on social/community standards and responsibility, including robust standards for indigenous peoples, labour standards, and consultation with locally affected communities within the Project Finance market. They have also promoted convergence around common environmental and social standards. Multilateral development banks, including the European Bank for Reconstruction & Development, and export credit agencies through the Organisation for Economic Co-operation and Development (OECD) Common Approaches are increasingly drawing on the same standards as the EP.

The EP have also helped spur the development of other responsible environmental and social management practices in the financial sector and banking industry (for example, Carbon Principles in the US, Climate Principles worldwide) and have provided a platform for engagement with a broad range of interested stakeholders, including non-governmental organisations (NGOs), clients and industry bodies.

The EP consist of 10 Principles, outlined below:

i. Principle 1: Review and Categorisation

When a Project is proposed for financing, the EPFI will, as part of its internal environmental and social review and due diligence, categorise it based on the magnitude of its potential environmental and social risks and impacts. Such screening is based on the environmental and social categorisation process of the International Finance Corporation (IFC).

Using categorisation, the EPFI's environmental and social due diligence is commensurate with the nature, scale and stage of the Project, and with the level of environmental and social risks and impacts.

The categories are:

Category A – Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented;

Category B – Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and

Category C – Projects with minimal or no adverse environmental and social risks and/or impacts

ii. Principle 2: Environmental and Social Assessment

For all Category A and Category B Projects, the EPFI will require the client to conduct an Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and impacts of the proposed Project. The Assessment Documentation should propose measures to manage impacts in a manner relevant and appropriate to the nature and scale of the proposed Project. One or more specialised studies may also need to be undertaken for the Assessment Documentation. It may, in some cases, be appropriate for the client to complement its Assessment Documentation with specific human rights due diligence.

For all Projects, in all locations, when combined Scope 1 and Scope 2 Emissions are expected to be more than 100,000 tonnes of CO2 equivalent annually, an alternatives analysis will be conducted to evaluate less Greenhouse Gas (GHG) intensive alternatives.

iii. Principle 3: Applicable Environmental and Social Standards

The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.

EPFIs operate in diverse markets: some with robust environmental and social governance, legislation systems and institutional capacity designed to protect their people and the natural environment; and some with evolving technical and institutional capacity to manage environmental and social issues.

The EPFI will require that the Assessment process evaluates compliance with the applicable standards for what are known as Designated Countries (the First World countries with robust regulatory systems), where the Assessment process evaluates compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues; and Non-Designated Countries, where the Assessment process evaluates compliance with the then applicable IFC Performance Standards

iv. Principle 4: Environmental and Social Management System and Equator Principles Action Plan

For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's satisfaction, the client and the EPFI will agree an Equator Principles Action Plan (AP). The Equator Principles AP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards.

v. Principle 5: Stakeholder Engagement

For all Category A and Category B Projects, the EPFI will require the client to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities and, where relevant, Other Stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process. The engagement process should be free from external manipulation, interference, coercion and intimidation. The client will take account of, and document, the results of the Stakeholder Engagement process, including any actions agreed resulting from such process. For Projects with environmental or social risks and adverse impacts, disclosure should occur early in the Assessment process, in any event before the Project construction commences, and on an ongoing basis. EPFIs recognise that indigenous peoples may represent vulnerable segments of project-affected communities. Projects affecting indigenous peoples are subject to a more rigorous process of Informed Consultation and Participation.

vi. Principle 6: Grievance Mechanism

For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish a grievance mechanism designed to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance. The grievance mechanism will seek to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate, readily accessible, at no cost, and without retribution to the party that originated the issue or concern. The mechanism should not impede access to judicial or administrative remedies. The client will inform the Affected Communities about the mechanism in the course of the Stakeholder Engagement process.

vii. Principle 7: Independent Review: Project Finance

For all Category A and, as appropriate, Category B Projects an Independent Environmental and Social Consultant, not directly associated with the client, will carry out an Independent Review of the Assessment Documentation including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles compliance.

Project-Related Corporate Loans

An Independent Review by an Independent Environmental and Social Consultant is required for Projects with potential high-risk impacts including, but not limited to, any of the following

adverse impacts on indigenous peoples, Critical Habitat impacts, Significant cultural heritage impacts and Large-scale resettlement.

In other Category A, and as appropriate Category B, Project-Related Corporate Loans, the EPFI may determine whether an Independent Review is appropriate or if internal review by the EPFI is sufficient. This may take into account the due diligence performed by a multilateral or bilateral financial institution or an OECD Export Credit Agency, if relevant.

viii. Principle 8: Covenants

An important strength of the Equator Principles is the incorporation of covenants linked to compliance. For all Projects, the client will covenant in the financing documentation to comply with all relevant host country environmental and social laws, regulations and permits in all material respects.

Furthermore, for all Category A and Category B Projects, the client will covenant the financial documentation:

a) to comply with the ESMPs and Equator Principles AP (where applicable) during the construction and operation of the Project in all material respects;
b) to provide periodic reports in a format agreed with the EPFI (with the frequency of these reports proportionate to the severity of impacts, or as required by law, but not less than annually), prepared by in-house staff or third-party experts, that document compliance with the ESMPs and Equator Principles AP (where applicable), and provide representation of compliance with relevant local, state and host country environmental and social laws, regulations and permits; and
c) to decommission the facilities, where applicable and appropriate, in accordance with an agreed decommissioning plan.
d) Where a client is not in compliance with its environmental and social covenants, the EPFI will work with the client on remedial actions to bring the Project back into compliance to the extent feasible. If the client fails to re-establish compliance within an agreed grace period, the EPFI reserves the right to exercise remedies, as considered appropriate.

ix. Principle 9: Independent Monitoring and Reporting Project Finance

To assess Project compliance with the Equator Principles and ensure ongoing monitoring and reporting after Financial Close and over the life of the loan, the EPFI will, for all Category A and, as appropriate, Category B Projects, require the appointment of an Independent Environmental and Social Consultant, or require that the client retain qualified and

experienced external experts to verify its monitoring information which would be shared with the EPFI.

Project-Related Corporate Loans

For Projects where an Independent Review is required under Principle 7, the EPFI will require the appointment of an Independent Environmental and Social Consultant after Financial Close, or require that the client retain qualified and experienced external experts to verify its monitoring information which would be shared with the EPFI.

x. Principle 10: Reporting and Transparency Client Reporting Requirements

The following client reporting requirements are in addition to the disclosure requirements in Principle 5.

For all Category A and, as appropriate, Category B Projects:

The client will ensure that, at a minimum, a summary of the ESIA is accessible and available online.

The client will publicly report GHG emission levels (combined Scope 1 and Scope 2 Emissions) during the operational phase for Projects emitting over 100,000 tonnes of CO2 equivalent annually.

EPFI Reporting Requirements

The EPFI will report publicly, at least annually, on transactions that have reached Financial Close and on its Equator Principles implementation processes and experience, taking into account appropriate confidentiality considerations.

There are two important Attachments to the Equator Principles: Annexure A dealing with Climate Change: Alternatives Analysis, Quantification and Reporting of Greenhouse Gas Emissions; and Annexure B dealing with Minimum Reporting Requirements on:

- Data and Implementation Reporting
- Project Finance Advisory Services Data
- Bridge Loans Data
- Implementation Reporting
- Project Name Reporting for Project Finance

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Locality

West Wits Mining MLI (Proprietary) Limited (West Wits) holds a prospecting right (GP 30/5/1/1/2/10035 PR) over various portions of the farms, *inter alia,* Roodepoort 237 IQ and Witpoortjie 245 IQ, in the City of Johannesburg Metropolitan Municipality, Gauteng Province. Consent in terms of Section 11(2) of the Mineral and Petroleum Resources Development Act (MPRDA) (No. 28 of 2002) to cede a renewed prospecting right MPT No. 29/2016 from Mintails SA Soweto Cluster (Proprietary) Limited to West Wits was granted by the Department of Mineral Resources (DMR) in 2018.

Therefore, West Wits intends to now apply to the DMR for a mining permit for gold, uranium and silver over a portion of portion 1 of the Farm Witpoortjie 245 IQ and a portion of the Remainder of portion 14 of the Farm Roodepoort 237 IQ, referred to as Kimberley West. The resource would be accessed via opencast mining activities.

The proposed mining permit will be located on a Portion of Portion 1 of the Farm Witpoortjie 245 IQ, a Portion of the Remainder of Portion 14 of the Farm Roodepoort 237 IQ, a portion of the waste rock dump will be located on a Portion of Portion 92 of the Farm Vlakfontein 238 IQ and a section of the access/haul road will be located on the Remainder of Potion 1 of the Farm Vlakfontein 238 IQ, Gauteng Province.

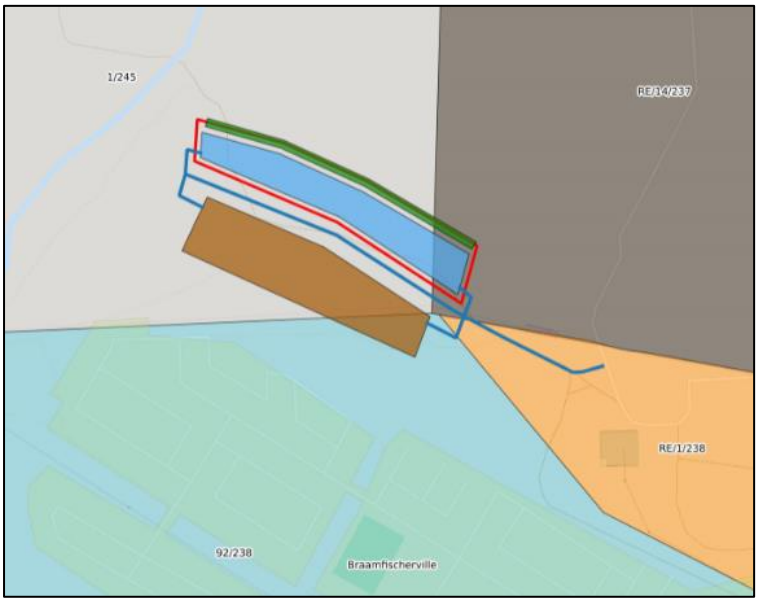

Figure 2: Location of the Kimberley West opencast footprint with property portions

Figure 3: Closer view of the location of the Kimberley West footprint (yellow and brown polygons)

2.2 Technical Project Description

The following brief project description for the project has been supplied by Malan Scholes Consulting.

The West Wits ('the project') Mining Permit for Kimberley West will include a Mining Work Programme and an integrated Environmental Authorisation application in terms of NEMA and National Environmental Management: Waste Act, No. 59 of 2008 (NEMWA), as well as in terms of the National Water Act, No 36 of 1998 (NWA). Mining would involve the removal of low grade gold bearing material that would be accessed via opencast mining. The gold bearing material would be processed at plants off-site. Once the removal of economic material has been completed the site will be rehabilitated. The post closure land use will be identified during the Environmental Impact Assessment process, a Basic Assessment process will be followed, and the land could be suitable for housing or agriculture purposes.

Opencast mining activities would include conventional open pit mining operations of load and haul to off-site processing plants, not excluding the option to blast but predominantly conducted through using modern methods and equipment for rock breaking which should not be intrusive to communities. Overburden and other non-mineralised rock will be excavated to expose the

targeted reefs of the opencast reserves. This material would be used to backfill and rehabilitate the pit areas.

Basic overview of the mining method

At the open pit targets, mining operations will be undertaken using a conventional excavate, load and haul mining cycle. Trees and bush will initially be removed, and topsoil will be excavated and hauled to an identified topsoil stockpile. Waste material below the topsoil will also be excavated and hauled to the identified waste dumping sites. Ore will be excavated and hauled to an ore stockpile for initial crushing before transportation to the processing plant. Breakage of any material that is not susceptible to free-dig excavation will be enabled through excavators fitted with rock breaking technology and it is expected that no blasting will be required at any of the open pit targets. It is expected that mining at the open pit targets will be carried out by a mining contractor. **Figure 4** and **Figure 5** below, show views of the current opencast mining operations at Sol Plaatjie Pit and the rock-breaking machinery being used.

Figure 4: View of the current opencast mining operations at Sol Plaatjie opencast operation.

Figure 5: Closer view of the equipment used to break up the rock. The machine uses an Xcentric Ripper, which is an attachment developed for high-performance rock excavation and concrete demolition work. The production rates are up to 5 times greater than using a hydraulic breaker.

Summary of infrastructure requirements such as roads, rail, electricity and water

It is envisaged that managerial and supervision operations during the extraction of ore from the open pit target areas will be performed from the existing Sol Plaatje operation site. No additional infrastructure is therefore required during the open pit phase (Years 1 to 3). The mining and rehabilitation periods for the Kimberley West opencast area are expected to be 4 to 5 months and 8 to 9 months, respectively.

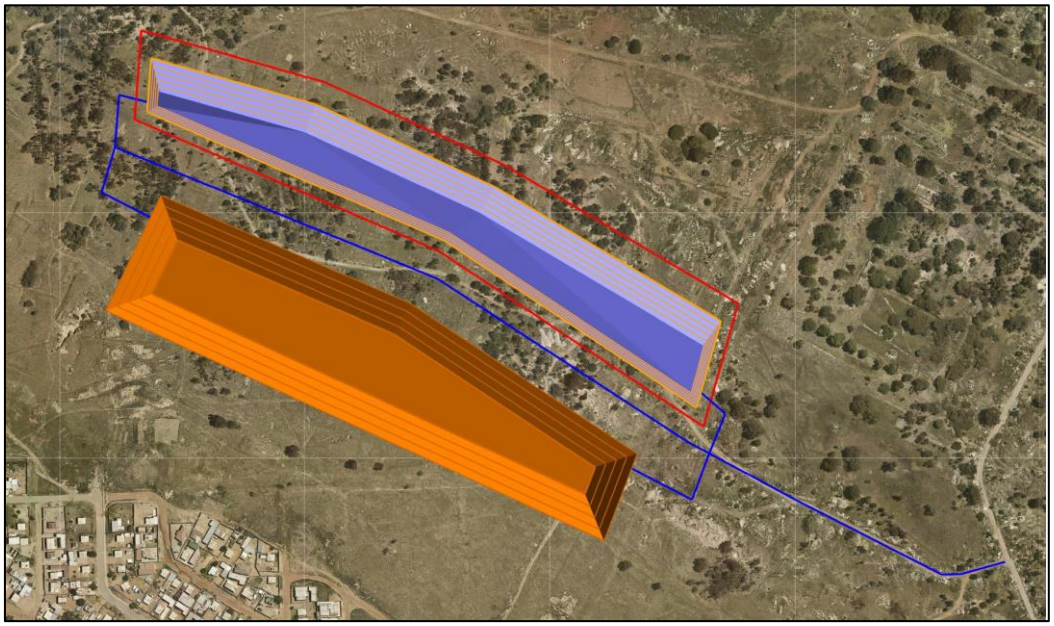

Figure 6: Kimberly Reef West Open Pit Layout showing the position of the pit (blue polygon), waste rock dump (brown polygon) and the associated access roads (blue)

3 ASSESSMENT METHODOLOGY

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

3.1 Methodology for Assessing Heritage Site significance

This HIA report was compiled by PGS for the proposed Kimberley West opencast mining permit. 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: The background information to the field survey relied greatly on the Heritage Background Research.

Step II – Physical Survey: A physical survey was conducted on foot through the proposed project area by a qualified archaeologist and heritage specialist which was 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 heritage resources, the assessment of resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

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

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

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

A - No further action necessary;

B - Mapping of the site and controlled sampling required;

C - No-go or relocate development activity position;

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

E - Preserve site.

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

3.1.1 Site Significance

Site significance classification standards prescribed by the SAHRA (2006) and approved by the ASAPA for the Southern African Development Community (SADC) region, were used for the purpose of this report.

Table 2: Site significance classification standards as prescribed by SAHRA.

Field Rating	Grade	Significance	Recommended Mitigation
National Significance (NS)	Grade 1	-	**Conservation; National Site nomination**
Provincial Significance (PS)	Grade 2	-	**Conservation; Provincial Site nomination**
Local Significance (LS)	Grade 3A	High Significance	**Conservation; Mitigation not advised**
Local Significance (LS)	Grade 3B	High Significance	**Mitigation (Part of site should be retained)**
Generally Protected A (GP.A)	-	High / Medium Significance	**Mitigation before destruction**
Generally Protected B (GP.B)	-	Medium Significance	**Recording before destruction**
Generally Protected C (GP.A)	**-**	**Low Significance**	**Destruction**

3.2 Methodology for Impact Assessment

The environmental assessment methodology used to assess the potential impacts on heritage resources discussed in this report. The methodology uses the following concepts in the assessment:

- **Nature of the impact**: A *brief description of the impact being assessed, in terms of the proposed activity or project, including the socio-economic or environmental aspect affected by this impact.*
- **Status of the impact:** *Whether the impact is of benefit or detriment to the environment or whether it is neutral.*
- **Magnitude of the impact: A** *brief description of the intensity or amplitude of the impact on socio-economic or environmental aspects.*

- **Extent of the project:** A *brief description of the spatial influence of the impact or the area that will be affected by the impact*.
- **Duration of the impact: A** *short description of the period of time the impact will have an effect on aspects*.
- **Probability of the impact occurring: T**he *estimated chance of the impact happening*.
- **Degree to which the impact can be reversed:** *The ability of an impact to be changed from a state of affecting aspects to a state of not affecting aspects*.
- **Degree to which impact may cause irreplaceable loss of resources: T***he amount of resources that can/can't be replaced.*
- **Degree to which the impact can be mitigated:** *The effect of mitigation measures on the impact and its degree of effectiveness.*
- **Confidence rating:** *Level of certainty of the impact occurring*.
- **Significance of the impacts:** *The combination of the duration and importance of the impact, in terms of physical and socio-economic extent, resulting in an indicative level of mitigation required*.
- **Cumulative impacts:** *The effect the combination of past, present and "reasonably foreseeable" future actions have on aspects.*

4 CURRENT STATUS QUO

4.1 Site Description

The greater Roodepoort region has been extensively altered by historical mining activities since the farms Vogelstruisfontein, Roodepoort, Langlaagte and the two portions comprising Paardekraal (in Krugersdorp) were proclaimed as public diggings by the then Zuid-Afrikaansche Republiek (ZAR) government in 1886.

Present land uses associated with the general surrounds include a combination of informal settlements, low-cost and high-cost residential areas, industrial areas and manufacturing and distribution facilities, historical mine housing and historical mine infrastructure (tailings dams, shafts, derelict/abandoned buildings and water dams), powerlines and road infrastructure.

The Kimberley West opencast footprint area consists of relatively flat terrain covered with secondary grassland with scattered stands of black wattle and eucalyptus trees. Historical mining activities and recent illegal informal mining activities have altered the natural topography of the

area. There is a large linear excavation located in the north-west section of the opencast pit footprint area. The entire footprint area is also covered by extensive dumping of building rubble and general waste (Figure 7 to Figure 12). A residential area of low-cost housing is located immediately south of the proposed opencast footprint area, within 120m of the proposed waste rock dump boundary.

It should be noted that there is an existing opencast mining operation underway in the Sol Plaatjies area. The pit is located 0.54 km to the south-east of the proposed Kimberley West opencast footprint. There is also an existing large Tailings Storage Facility located approximately 1.37km to the south-east of Kimberley West footprint.

The current mining operation in the Sol Plaatjies area is being undertaken as a consequence of a Directive received from the DMR and under the NEMA (No 107 of 1998), for the landowner to clean up and rehabilitate the Sol Plaatjie area to rid it of illegal mining. The landowner is compelled to comply with the Directive, and in order to give effect to this NEMA Directive, the landowner appointed West Wits to remove the easily accessible opencast ore on the land which the illegal miners exploit, as removing this ore will stop the illegal mining. As part of this process, West Wits is obliged to concrete over access adits to the old underground workings, to also prevent access by illegal miners. This rehabilitation operation is supported by the DMR and the South African Police services (SAPS). This rehabilitation project is short term and the rehabilitated land will be used after removal of the ore which attracts the illegal miners, for a housing property development. Rehabilitation of this area pursuant to the NEMA Directive is therefore an essential requirement for the property development.

Figure 7: Pit area - General view of grass, trees and dumping

Figure 8: Pit area - View of extensive dumping of rubble and general waste

Figure 9: Pit area - View of the linear excavation from old diggings

Figure 10: Pit area - View showing old soil dumps

Figure 11: Waste dump area, showing burnt vegetation

Figure 12: Waste dump area, old excavation

4.2 Archival findings

The archival research focused on available information sources that were used to compile a background history of the study area and surrounds. This data then informed the possible heritage resources to be expected during field surveying.

4.2.1 Heritage mapping

The sensitivity maps were produced by overlying:

- Satellite Imagery; and
- Topographical Maps dating from the 1940s to the 1970s.

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

- Structures/Buildings.

By superimposition and analysis, it was possible to rate these structures/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 3. However, during the site survey it was clear that any historical architectural structures that had existed in or adjacent to the footprint area had since been demolished.

Table 3: Tangible heritage site in the study area

Name	Description	Legislative protection
Architectural Structures	Possibly older than 60 years	NHRA Sect 3 and 34

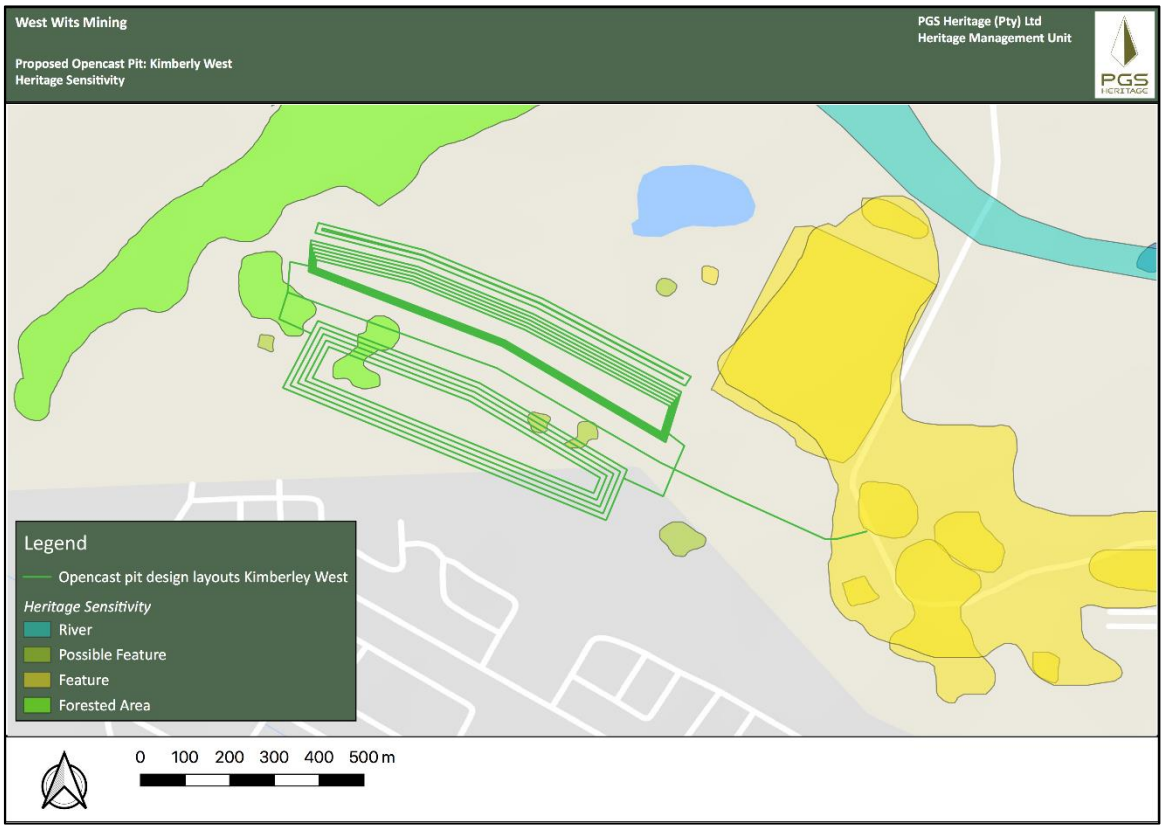

Figure 13: Heritage sensitivity map indicating possible sensitive areas within and around the Kimberley West opencast footprint

4.3 South African Heritage Resources Information System (SAHRIS)

A scan of SAHRIS revealed several previous heritage studies conducted in the general region of Roodepoort, however, only a few studies have been undertaken in the immediate vicinity of the Kimberley West opencast footprint. These are summarised below:

- *Birkholtz.PD. 2006. Phase 1 Heritage Impact Assessment for the Proposed Jameson Field Extension 1 Residential Township Development, Gauteng Province. Compiled for: KWP Landscape Architects/Environmental Consultants By Archaeology Africa CC*

  Archaeology Africa was commissioned by Marsh Environmental Services to undertake a HIA for the proposed Jameson Field Extension 1 development located on Portions 12 and 37 of the farm Vlakfontein 238 IQ. The study identified seven heritage sites comprising three sites that can be directly associated with the Jameson Raid and its final battle on 2 January 1896, three buildings and one cemetery. This study area is located roughly 3.74km to the south-west of the Kimberley West footprint area.

- *Du Pisanie, J. 2014. Mining Right Application for Reclamation of the Soweto Cluster Dumps, Roodepoort, Gauteng Province Heritage Impact Assessment. DMR Ref Number: GP 30/5/1/2/2(10020) MR. Prepared for Ergo Mining (Pty) Ltd by Digby Wells Environmental.*

  The proposed Soweto Cluster Project area is located in the Gauteng Province on the farms Vogelstuisfontein 231 IQ; Roodepoort 237 IQ; and Vlakfontein 238 IQ. The project area is situated adjacent to several suburbs of greater Soweto, approximately 20 km from the Johannesburg Central Business District (CBD). This study identified two burial grounds, several historical structures, several industrial era buildings, the historical Durban Roodepoort Deep Mine and associated structures, one declared heritage site. This greater study area includes the location of the Kimberley West footprint area.

- *Birkholtz, P. 2017. Heritage Impact Assessment for the Proposed Establishment of Goudrand Ext. 12 and Goudrand Ext. 13, located within the Roodepoort Magisterial District, City of Johannesburg Metropolitan Municipality, Gauteng Province. for Client: Hunter Theron Inc. By PGS Heritage.*

  The HIA study formed part of the EIA)for the proposed establishment Goudrand Ext. 12 and Goudrand Ext. 13, situated within the Roodepoort Magisterial District, City of Johannesburg Metropolitan Municipality, Gauteng Province. Three sites comprising the mostly demolished ruins of historical mining infrastructure were identified during the fieldwork

4.4 Archaeological background

4.4.1 Stone Age period

The Early Stone Age (ESA) (2.5 million to 250 000 years ago) 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 (Korsman, & Meyer, 1999). A number of ESA sites are known from the general vicinity. One of these is situated roughly 2.11km south-east of the Kimberley West footprint (Birkholtz, 2001).

The Middle Stone Age (MSA) is the second oldest phase identified in South Africa's archaeological history (250 000 to 40 000 years ago). This phase is associated with flakes, points and blades manufactured by means of the so-called 'prepared core' technique (Korsman, & Meyer, 1999).

The Later Stone Age (40 000 years ago to the historic past) is the third archaeological phase identified and is associated with an abundance of very small artefacts known as microliths (Korsman, & Meyer, 1999).

4.4.2 Overview of the Iron Age in the Johannesburg region

Early Iron Age (EIA) sites in the Witwatersrand area date between 500 AD and 900 AD. The Magaliesberg mountain range represents the most southern point of distribution of these sites. The most well-known EIA site in this general area is Broederstroom, located next to the Hartebeespoort Dam, to the west of the route corridor. This site is dated to 350 - 600 AD and represents the first phase of occupation in the region by Bantu speaking farmers (Huffman 2007). No Early Iron Age sites are known from the immediate vicinity of the footprint area.

The Late Iron Age occupation of this area by Sotho-Tswana communities is represented by four ceramic sequences of the Urehwe tradition: Ntsuanatsatsi (1450-1650), Olifantspoort (AD 1500 - 1700), Uitkomst (AD 1700-1850) and Buispoort (1700-1840) (Huffman 2007). No Late Iron Age sites are known from the immediate vicinity of the footprint area.

It seems that agropastoralists did not settle in the Johannesburg region until the Late Iron Age (AD 1300-1840). According to the ceramic evidence, Sotho-Tswana and Nguni speakers moved south into southern Africa between about AD 1100 and 1300. Generally, Nguni occupied the eastern regions, while Sotho-Tswana moved onto the plateau, starting in the Limpopo Province.

After a while, the first Sotho-Tswana groups split into two clusters: a Western cluster (that today includes BaHurutshe, BaKwena, BaKgatla, BaNgwaketse and BaNgwato) centred in the present-day Northwest Province; and a Southwestern cluster (including BaRolong and BaThlaping) that

inhabited the region from the Magaliesberg to Potchefstroom, including Johannesburg. Radiocarbon dates place the pottery (called Olifantspoort after the site where it was first recorded) between about AD 1450 and 1700.

In the 15th century BaFokeng people, using the early type of walling, spread north across the Vaal. Type N sites are on record near Balfour, in the Suikerbosrand, Vredefort Dome, Pretoria and Greater Johannesburg area. For Johannesburg, some of the best examples occur in the Klipriviersberg to the south. The associated pottery is called "*Uitkomst*" (after the name of a cave where it was first found). Radiocarbon dates place this first walling with "*Uitkomst*" pottery between about AD 1440 and 1665 (Bergh 1999, http://www.sahistory.org.za/places/johannesburg).

All agropastoralists appear to have left Greater Johannesburg between AD 1670 and 1780 when the climate became cooler and drier. When conditions improved 100 years later, Sotho-Tswana farmers once again lived in the area. Sotho-Tswana occupation came to an end in the Greater Johannesburg in 1823 as a result of the *difaqane* period when Mzilikazi's Ndebele group moved into and through the area. Mzilikazi first established his headquarters near Heidelberg before moving to Pretoria (Bergh 1999, http://www.sahistory.org.za/places/johannesburg).

4.5 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 for various years were assessed to observe the development of the area, as well as the location of possible historical sites 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 14** to **Figure 16)**.

4.5.1 Topographic map sheet 2627BB First Edition 1943

A portion of the First Edition of the 2627BB Topographical Sheet is depicted below. The map was compiled and drawn by the Survey Depot (Tech.) S.A.E.C. from 1:25 000 sheets by the Survey Depot S.A.E.C. in 1943. A field revision was undertaken by the 45 Survey Coy. S.A.E.C. in 1943. It was reprinted in the Union of South Africa by the Government Printer, Pretoria in 1955.

4.5.2 Topographic map sheet 2627BB Second Edition 1954

A portion of the Second Edition of the 2627BB Topographical Sheet is depicted below. The map was based on air photography from 1952. It was surveyed in 1954 and drawn in 1956 by the Trigonometrical Survey Office. It was printed in the Union of South Africa by the Government Printer, Pretoria in 1957.

4.5.3 Topographic map sheet 2627BB Second Edition 1977

A portion of the Third Edition of the 2627BB Topographical Sheet is depicted below. The sheet was remapped in 1977 by the Director-General Surveys. It was printed and published by the Government Printer in 1979.

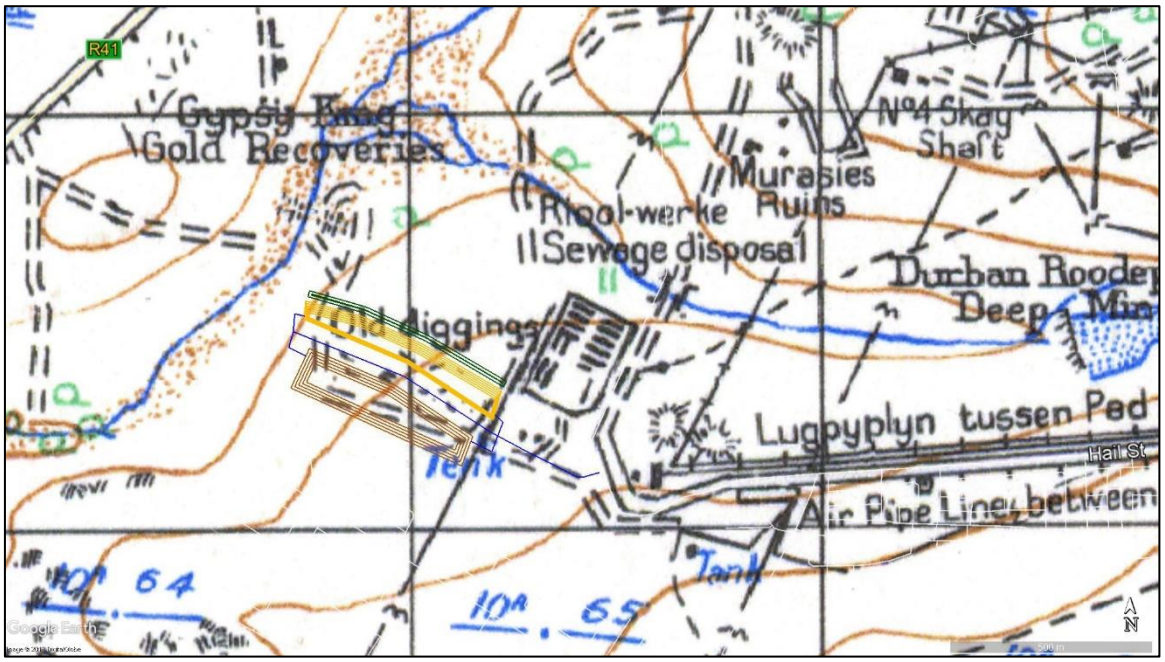

Figure 14: Enlarged section of the sheet 2627BB Ed 1, 1943. The only features depicted within the location of the Kimberley West footprint area are "old diggings". The compound depicted to the immediate north-east was found to have been demolished.

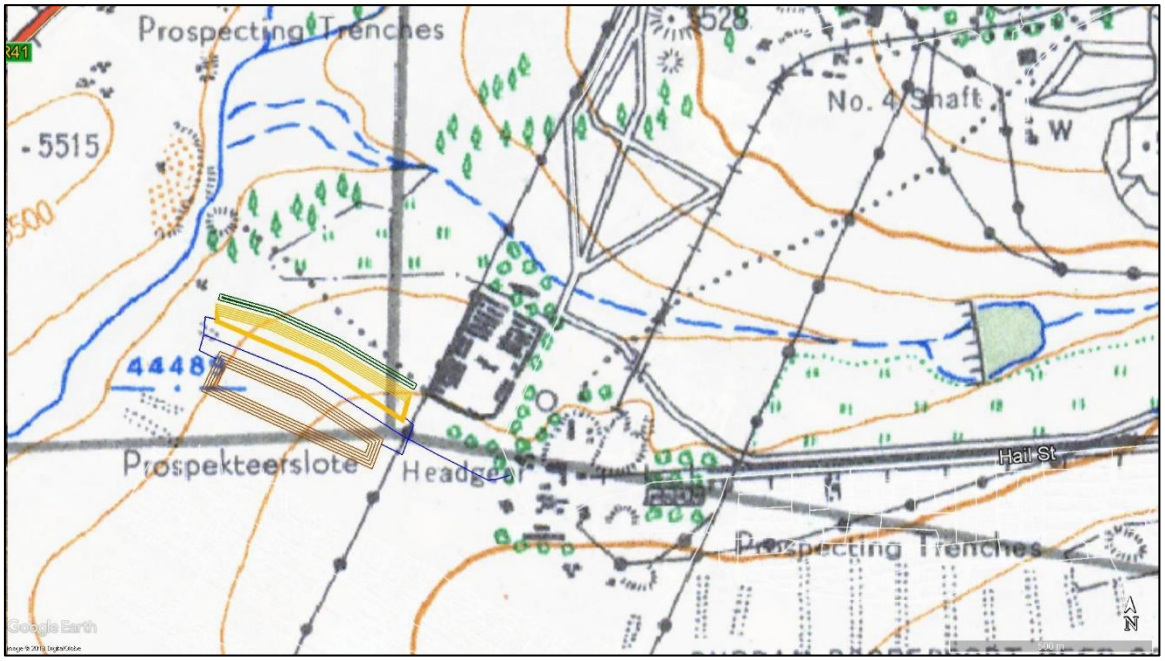

Figure 15: Enlarged section of the sheet 2627BB Ed 2, 1954. The only features depicted within the location of the Kimberley West footprint area are "prospecting trenches"". The compound depicted to the immediate north-east was found to have been demolished.

Figure 16: Enlarged section of the map 2627BB Ed 3 1977. No heritage features are depicted within the footprint of the Kimberley West area, except an old digging. The compound and the structures depicted to the east was found to have been demolished.

4.6 Aspects of the area's history as revealed by the archival/desktop study

4.6.1 Brief History of Roodepoort and surrounds

After the discovery of gold on the farm Roodepoort and surrounding farms during 1886, these properties were declared public prospecting areas by a Notice in the "Staatscourant" published on 8 September 1886 (Roux, 1955). The expansion of gold prospecting activities in and around the farm Roodepoort, resulted in the need for a town. By February 1887, the first residential stands of what would become Roodepoort were sold (Erasmus, 2004). In 1904, the town of Roodepoort-Maraisburg was given municipal status (Erasmus, 2004).

4.6.2 History of Gold Mining within the Study Area and Surrounding Landscape (Birkholtz, 2017)

<u>The farms Vlakfontein and Roodepoort and Gold Mining</u>

Vlakfontein

The farm Vlakfontein (numbered 155, later 45 and presently 238-IQ) was first inspected on 8 June 1859 by J.G. Marais. On 11 August 1859 it was granted to Jan Joosten. On the same day (11 August

1859) the farm was divided into three equal portions (A, B and C), which were transferred to the Harmse brothers, as below (Birkholtz, 2006):

- Portion A – Transported to Cornelis Johannes Harmse
- Portion B – Transported to Christiaan Bart Harmse
- Portion C – Transported to Bart Jacobus Harmse

Vlakfontein – Portion B was later transferred from Christiaan Bart Harmse to Jan Harm & Pieter Ignatius Michael du Plessis in 1864 and in 1884, to Willem Hendrik Steijn. WH Stein subsequently transferred this portion to Robert Morton Findlay for Stijn Sindicaat on 15 June 1888. The ownership was then transferred to R.M. Findlay for Steyn Estate and Gold Mining Company Ltd on 29 September 1888 and subsequently, on 18 March 1895, to the New Steyn Estate Gold Mines Limited. The archival records only indicate the ownership history up to the 1890s (Birkholtz, 2006). Troye's Map of the Witwatersrand Gold Fields (1890), confirms that the Steyn Estate & Gold Mining Company, owned 7000 acres on the farms Vlakfontein and Doornkop in 1890 (**Figure 17**).

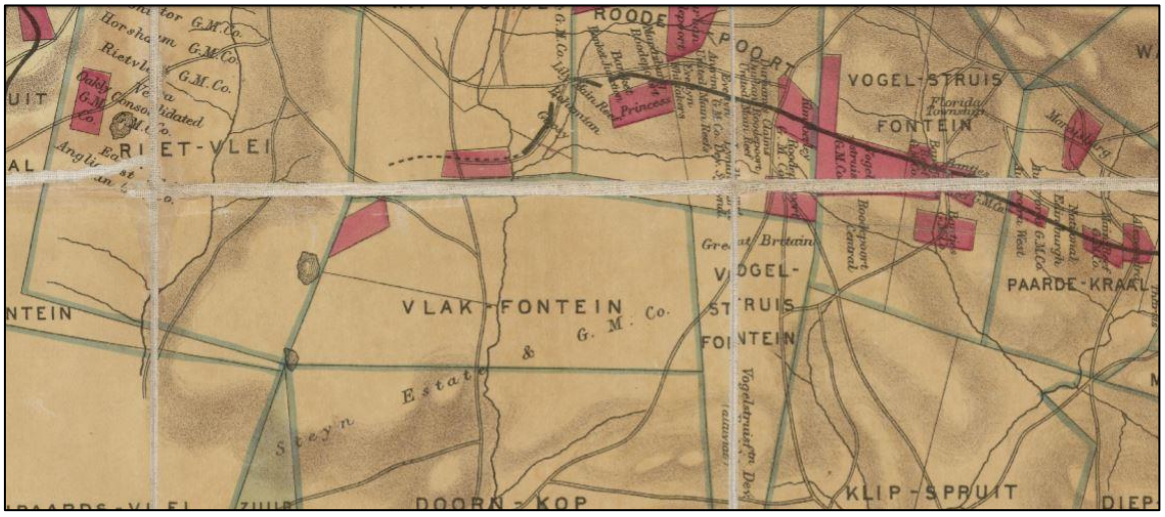

Figure 17: Enlarged section of Troy's Map of the Wiwatersrand Goldfields (The Digger's News Printing & Publishing Co Ltd.), dated 1890

Gold mining shares subsequently boomed in 1895. However, this boom and the progress of the gold mining industry was affected severely by the Jameson raid at the end of 1895. The farm of Vlakfontein was the scene of the surrender to Genl. Cronje., whose Boer forces held the koppie of Doornkop, blocking the way to Johannesburg (Payne, 1948).

In 1934, the property and assets of the New Steyn Estate were taken over by the Durban Deep mining company. These included the claims, plant and building of the old Roodepoort United. By 1948, the Durban Deep owned 3,007 mining claims on the farms Roodepoort, Vogelstruisfontein, Vlakfontein and Witpoortjie. In addition, its freehold property measured 4, 443 morgen (Payne, 1948).

Roodepoort

The farm Roodepoort located on the southern ridge of the Witwatersrand originally belonged to the brothers J.H. and A.S. du Plessis. On 14 November 1885 the brothers signed a contract with a group of prospectors which provided for prospecting rights on the farm Roodepoort in return for a percentage of the profits gained from the discovery and mining of any minerals found there. Four months after this, one of the prospectors, J.G. Bantjies, discovered the so-called Bird Reef during March 1886 on the farm Roodepoort. This was about the same time that the Main Reef was discovered accidentally by George Harrison and George Walker on the farm Langlaagte. Fred Struben subsequently discovered the same reef on the western boundary of the farm Vogelstruisfontein, and before long it was located on a number of the neighbouring farms, including Roodepoort.

In April of 1886 President Kruger received three petitions requesting that the farms Vogelstruisfontein, Roodepoort, Langlaagte and the two portions comprising Paardekraal be declared public diggings. The amended gold laws of 4 August 1886 had enabled the government to proclaim privately owned land as public diggings with or without the owner's approval. Subsequently, on 8 September 1886, a notice in the "De Staatscourant" informed all interested parties that the government had located yielding gold reefs on the Witwatersrand in the district of Heidelberg, including the farms Vogelstruisfontein and Roodepoort. The farms Vogelstruisfontein and Roodepoort were to be declared a public prospecting area on the 11 October 1886, as long as the owners or renters did not have the land cordoned off as workable areas, gardens, arable land and water furrows. By the end of 1886 there were approximately 150 persons residing on the farm Roodepoort (Roux, 1955).

4.7 Conclusions

The archival and historical research has revealed that the entire area of the farms Witpoortjie 245 IQ, Roodepoort 237 IQ and Vlakfontein 238 IQ , on which the proposed Kimberley West opencast

mining footprint is situated, has been affected on a continual basis by historical mining activities. These mining activities have continued to the present day, both formally and informally (illegal). The ground affected by the Kimberley West opencast footprint is therefore extremely disturbed.

5 PALAEONTOLOGY

A basic palaeontological sensitivity was determined using the SAHRIS database palaeosensitivity map (http://www.sahra.org.za/sahris/map/palaeo). As can be seen in **Figure 18** to **Figure 20**, the proposed route occurs in an area where palaeontology is assessed as being entirely of Low to significance and no palaeontological studies are required. However, a finds protocol will be required.

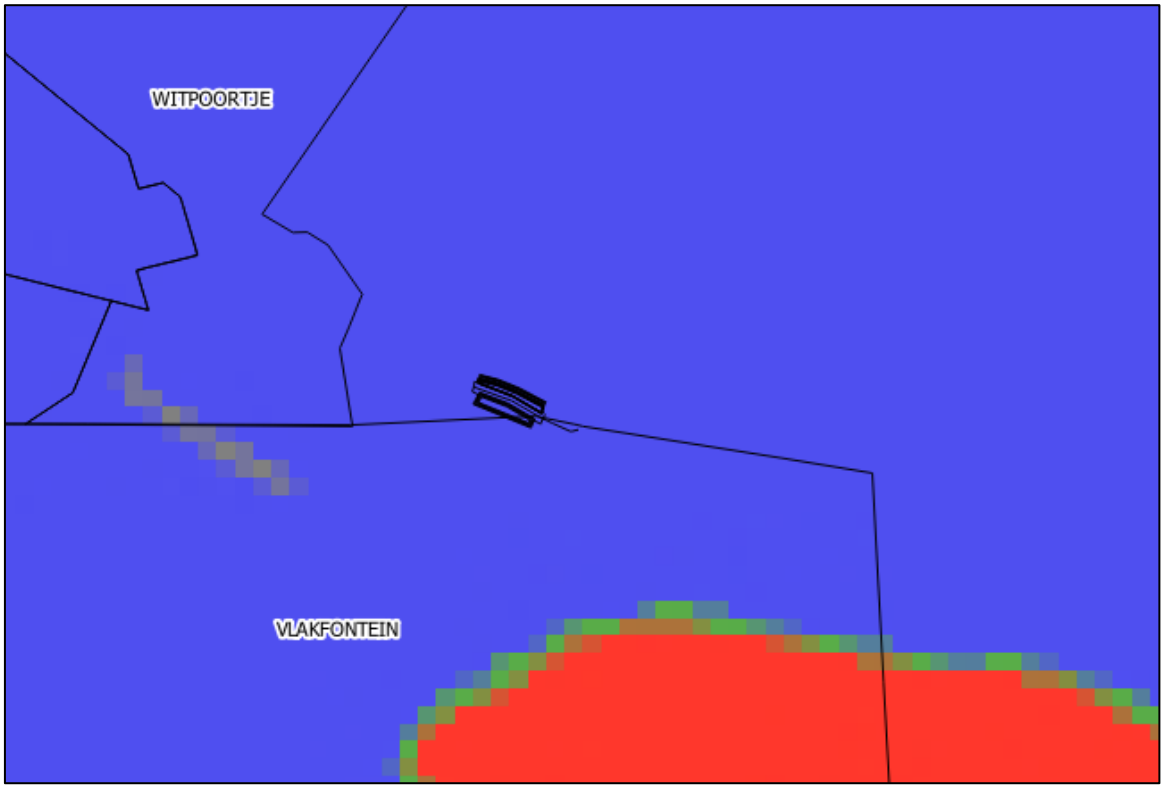

Figure 18: Overlay of the Kimberley West opencast footprint on the palaeosensitivity map from the SAHRIS database (showing that the entire footprint is coloured blue, which is rated as Low sensitivity.

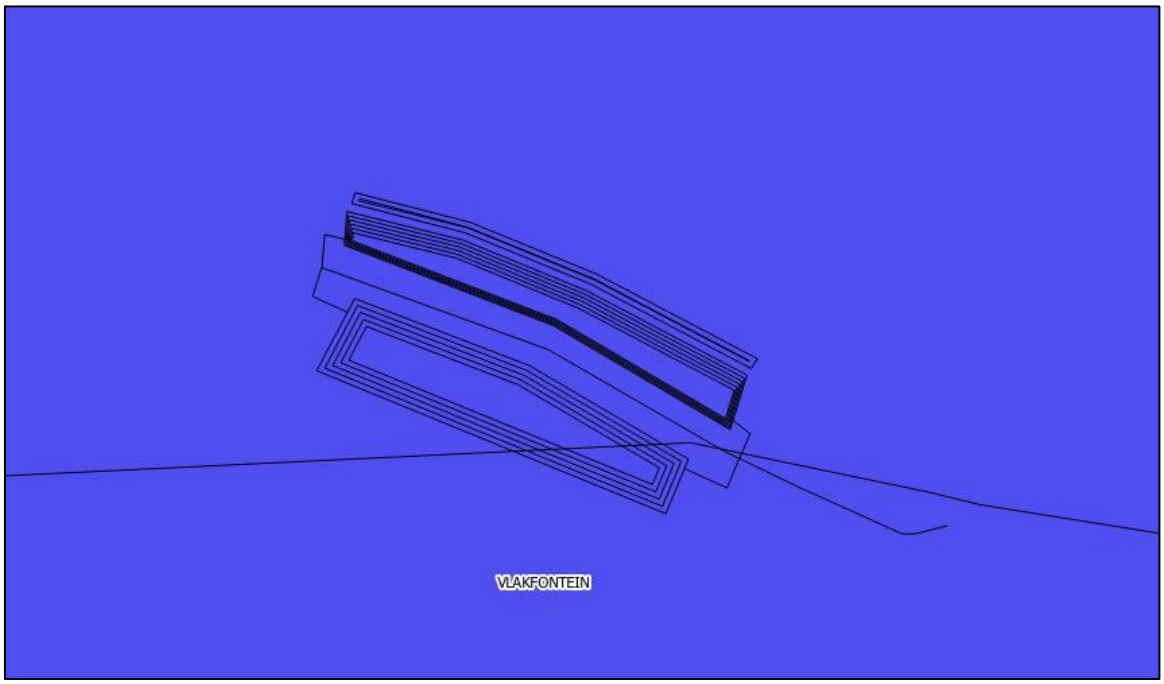

Figure 19: Enlarged section of the overlay of the Kimberley West footprint on the palaeosensitivity map, which confirms the entire area is assessed as being of Low sensitivity.

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

Figure 20: Sensitivity ratings from SAHRIS

6 FIELD WORK FINDINGS

Due to the nature of cultural remains, with the majority of artefacts occurring below the surface, a controlled-exclusive surface survey was conducted on two separate days (26 April and 8 May 2018) by vehicle and on foot by a team from PGS consisting of an archaeologist and a heritage specialist on one day and a heritage specialist and field technician on the other day (accompanied by two security staff on both days). The fieldwork was logged with a GPS receiver and all finds were marked. The second survey was undertaken to assess areas which had not been included in the original footprint area provided to PGS.

During the field assessment of the Kimberley West pit footprint, no heritage sites were identified. Refer to **Figure 21** for the tracklog the proposed footprint area.

Figure 21: Tracklog of the field survey of the Kimberley West opencast footprint (red lines).

6.1 Site Descriptions

No heritage sites were identified within the footprint for the Kimberley West opencast area. Refer to section 8 for the recommended general management measures as proposed for inclusion in the EMPr.

7 IMPACT ASSESSMENT

The aim of the impact evaluation is to determine the extent of the impact of the proposed project on the identified heritage resources and predict possible impacts on unidentified heritage resources.

During the field assessment of the Kimberley West opencast footprint area, no heritage sites were located. Therefore, no impact on heritage resources can be assessed.

7.1 Status Quo and "No Go" option

7.1.1 Status Quo

No fatal flaws were identified from a cultural, historical, archaeological and paleontological perspective.

7.1.2 "No go" Option

No such option is contemplated.

7.1.3 Impact on Palaeontological Resources

The palaeontological sensitivity of the area determined using the SAHRIS database palaeosensitivity map (http://www.sahra.org.za/sahris/map/palaeo) indicsated that the entire proposed Kimberley West opencast footprint is underlain by geology of a Low palaeontological significance and no palaeontological studies are required. However, a finds protocol will be required.

It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly uncovered fossils. It is thus considered that the development of the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.

In the event that fossil remains are discovered during any phase of construction, either on the surface or unearthed by fresh excavations, the ECO in charge of these developments should be alerted immediately. These discoveries must be protected (preferably *in situ*) and the ECO must report to SAHRA so that appropriate mitigation (*e.g.* recording, collection) can be carry out by a professional palaeontologist.

Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an approved collection (museum or university collection) and all fieldwork and reports should meet the minimum standards for palaeontological impact studies created by SAHRA.

The impact of the proposed project on the Palaeontology is rated as having a LOW negative significance before mitigation with no further mitigation measures required.

Table 4 – Impacts on Heritage Resources

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE PRE-MITIGATION	MITIGATION POTENTIAL	SIGNIFICANCE POST-MITIGATION	CONFIDENCE RATING	CUMULATIVE IMPACTS
HERITAGE	Possible destruction of palaeontological fossil material	Neutral	1	1	1	4	7	2	14	Medium	14	Sure	Low
	Possible destruction of archaeological structures or material	Negative	1	1	1	4	7	1	7	Medium	7	Sure	Low
	Possible destruction of burial grounds and graves	Negative	1	1	1	4	7	1	7	Medium	7	Sure	Low
	Possible destruction of historical structures or material	Negative	1	1	1	4	7	1	7	Medium	7	Sure	Low
	Possibility of uncovering subsurface heritage material	Neutral	2	1	1	5	9	2	18	Medium	9	Unsure	Low

7.2 Project Impact (Unmitigated)

Since no heritage sites were located the project impact unmitigated will be neglible and requires no mitigation.

The palaeontological sensitivity of the Witwatersrand Goldfields geology underlying the proposed opencast footprint and general region is rated as Low. It is therefore recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required, pending the discovery of newly discovered fossils. It is thus considered that the establishing of the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.

In the event that fossil remains are discovered during any phase of construction, either on the surface or unearthed by fresh excavations, the ECO in charge of these developments ought to be alerted immediately. These discoveries ought to be protected (preferably *in situ*) and the ECO must report to SAHRA so that appropriate mitigation (*e.g.* recording, collection) can be carried out by a professional paleontologist.

Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an approved collection which comprises a museum or university collection, while all fieldwork and reports should meet the minimum standards for palaeontological impact studies proposed by SAHRA.

The Kimberley West opencast mining footprint has been disturbed extensively by historical and recent gold mining activities. Any archaeological or other heritage resources that existed within and around the footprint have been destroyed by these activities. The impact risk class is thus Low.

7.3 Cumulative Impact

The Kimberley West opencast mining footprint has been disturbed extensively by historical and recent gold mining activities. Any archaeological or other heritage resources that existed within and around the footprint have been destroyed by these activities and therefore the additional project impacts will not increase or decrease the significance of the existing baseline impacts. The impact is going to happen and will be short term in nature. The impact risk class is thus Low.

The baseline impacts are considered to be low for palaeontological resources, and additional project impacts (if no mitigation measures are implemented) will increase the significance of the existing baseline impacts, the cumulative unmitigated impact will probably be of a Low negative significance. The impact is going to happen and will be short term in nature. The impact risk class is thus Low.

8 MANAGEMENT RECOMMENDATIONS AND GUIDELINES

8.1 Construction phase

The project will encompass a range of activities during the construction phase, including ground clearance, establishment of construction camps area 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, such as construction camps and laydown areas, is 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 is implemented.

8.2 Chance find procedure

- A heritage practitioner should be appointed to develop a heritage induction program and conduct training for the ECO, as well as team leaders, in the identification of heritage resources and artefacts.
- An appropriately qualified 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 be halted.
- The qualified archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and impact on the heritage resource.
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the material and data are recovered.
- Construction can commence as soon as the site has been cleared and signed off by the archaeologist.

8.3 Possible finds during mining operations

The footprint area occurs within an already extremely disturbed area. However, although unlikely, it is possible that soil clearance and mining operations could uncover the following:

- foundations of historical mining infrastructure;
- ash middens associated with historical farmsteads and homesteads that can contain bone, glass and clay ceramics, ash, metal objects such as spoons, forks, and knives.
- possible infant burials at historical African homesteads

8.4 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** 5* gives guidelines for lead times on permitting.

Table 5: Lead times for permitting and mobilisation

ACTION	RESPONSIBILITY	TIMEFRAME
Preparation for field monitoring and finalisation of contracts	The contractor and service provide	1 months
Application for permits to do necessary mitigation work	Service provider – Archaeologist and SAHRA	1 month
Documentation, excavation and archaeological report on the relevant site	Service provider – Archaeologist	3 months
Handling of chance finds – Archaeology, Graves/Human Remains or Palaeontology	Service provider – Archaeologist and SAHRA	2 weeks

8.5 Heritage Management Plan for EMPr implementation

NO.	MITIGATION MEASURES	PHASE	TIMEFRAME	RESPONSIBLE PARTY FOR IMPLEMENTA-TION	MONITORING PARTY (FREQUENCY)	TARGET	PERFORMANCE INDICATORS (MONITORING TOOL)	COST
Possible finds								
A	Implement chance find procedures in case where possible heritage finds area made	Construction	During construction	Applicant ECO Heritage Specialist	ECO (weekly)	Ensure compliance with relevant legislation and recommenda-tions from SAHRA under Section 35, 36 and 38 of NHRA	ECO Monthly Checklist/Report	R10 000
Palaeontology	▪ The construction and operation of the development footprint is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area. ▪ In the event that fossil remains are discovered	Construction	Construction	Applicant ECO Palaeontologist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	ECO Monthly Checklist/Report	R20 000

NO.	MITIGATION MEASURES	PHASE	TIMEFRAME	RESPONSIBLE PARTY FOR IMPLEMENTA-TION	MONITORING PARTY (FREQUENCY)	TARGET	PERFORMANCE INDICATORS (MONITORING TOOL)	COST
	during any phase of construction, either on the surface or exposed by new excavations or removal of vegetation, the ECO in charge for the developments ought to be informed instantly. These finds must be protected (preferably in situ) and the ECO must alert SAHRA (South African Heritage Research Agency) to ensure that mitigation (e.g. recording, collection) can be undertaken							

NO.	MITIGATION MEASURES	PHASE	TIMEFRAME	RESPONSIBLE PARTY FOR IMPLEMENTA-TION	MONITORING PARTY (FREQUENCY)	TARGET	PERFORMANCE INDICATORS (MONITORING TOOL)	COST
	by a professional paleontologist. ▪ Preceding any excavation of fossils, a collection permit from SAHRA must be obtained. The fossil material must be housed in an approved collection (museum or university collection) and the fieldwork and reports need to comply with the minimum standards for palaeontological impact studies developed by SAHRA.							

9 CONCLUSIONS AND RECOMMENDATIONS

PGS was appointed by Malan Scholes Consulting to undertake a HIA that forms part of the BAR for the mining permit application for the proposed opencast pit referred to as Kimberley West, located on a portion of portion 1 of the Farm Witpoortjie 245 IQ and a portion of the Remainder of portion 14 of the Farm Roodepoort 237 IQ, Roodepoort Local Municipality, Johannesburg Metropolitan Municipality, Gauteng Province.

The archival and historical research has revealed that the entire area of the farms Witpoortjie 245 IQ, Roodepoort 237 IQ and Vlakfontein 238 IQ, on which the proposed Kimberley West opencast mining footprint is situated, has been affected on a continual basis by historical mining activities. These mining activities have continued to the present day, both formally and informally (illegal). The ground affected by the Kimberley West opencast footprint is therefore extremely disturbed.

The fieldwork findings confirmed that there are no identified heritage resources situated inside or adjacent to the Kimberley West foot print area.

Since no heritage resources were identified within the Kimberley West opencast footprint area, the overall impact of the development on heritage resources is regarded as VERY LOW and no mitigation measures are required.

9.1 Archaeology

No archaeological heritage resources were identified within the Kimberley West opencast footprint area.

9.2 Historical Structures

No historical structures were identified within the Kimberley West opencast footprint area.

9.3 Palaeontology

In Palaeontological terms the significance is rated as low negative. The proposed development is thus unlikely to pose a substantial threat to local fossil heritage. However, should fossil remains be discovered during any phase of construction, either on the surface or exposed by fresh excavations, the ECO responsible for these developments should be alerted immediately. Such discoveries ought to be protected (preferably in situ) and the ECO should alert SAHRA (South

African Heritage Research Agency) so that appropriate mitigation (e.g. recording, sampling or collection) can be taken by a professional palaeontologist.

9.4 Burial grounds and graves

No burial grounds or graves were identified within the Kimberley West opencast footprint area.

9.5 General

In the event that heritage resources are discovered during site clearance, construction activities must stop and a qualified archaeologist appointed to evaluate and make recommendations on mitigation measures.

Since no heritage resources were identified within the Kimberley West opencast footprint area, the overall impact of the development on heritage resources is regarded as VERY LOW and no mitigation measures are required.

It is my considered opinion that, based on the findings of the desktop research together with the fieldwork findings, the overall impact on heritage resources is acceptably low and the project can be approved from a heritage perspective.

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APPENDIX A

LEGISLATIVE REQUIREMENTS – TERMINOLOGY AND ASSESSMENT CRITERIA

1 General principles

In areas where there has not yet been a systematic survey to identify conservation worthy places, a permit is required to alter or demolish any structure older than 60 years. This will apply until a survey has been done and identified heritage resources are formally protected.

Archaeological and paleontological sites, materials, and meteorites are the source of our understanding of the evolution of the earth, life on earth and the history of people. In the NHRA, permits are required to damage, destroy, alter, or disturb them. People who already possess material are required to register it. The management of heritage resources is integrated with environmental resources and this means that before development takes place heritage resources are assessed and, if necessary, rescued.

In addition to the formal protection of culturally significant graves, all graves, which are older than 60 years and are not in a formal cemetery (such as ancestral graves in rural areas), are protected. The legislation protects the interests of communities that have an interest in the graves - they should be consulted before any disturbance takes place. The graves of victims of conflict and those associated with the liberation struggle are to be identified, cared for, protected and memorials erected in their honour.

Anyone who intends to undertake a development must notify the heritage resource authority and if there is reason to believe that heritage resources will be affected, an impact assessment report must be compiled at the construction company's cost. Thus, the construction company will be able to proceed without uncertainty about whether work will have to be stopped if an archaeological or heritage resource is discovered.

According to the National Heritage Act (Act 25 of 1999 section 32) it is stated that -
An object or collection of objects, or a type of object or a list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including –

- objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects, meteorites and rare geological specimens;
- visual art objects;

- military objects;
- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1 (xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives; and
- any other prescribed category.

Under the National Heritage Resources Act (Act No. 25 of 1999), provisions are made that deal with, and offer protection to, all historic and pre-historic cultural remains, including graves and human remains.

2 Graves and cemeteries

Graves younger than 60 years fall under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925) as well as the Human Tissues Act (Act 65 of 1983) and are under the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the Office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning, or in some cases the MEC for Housing and Welfare. Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. In order to handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

Graves older than 60 years, but younger than 100 years, fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act) as well as the Human Tissues Act (Act 65 of 1983) and are under the jurisdiction of the South African Heritage Resource Agency (SAHRA). The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in the category located inside a formal cemetery administrated by a local

authority will also require the same authorisation as set out for graves younger than 60 years, over and above SAHRA authorisation.

If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.

APPENDIX B

HERITAGE ASSESSMENT METHODOLOGY

Methodology for Assessing Heritage Site significance

This HIA report was compiled by PGS Heritage (PGS) for the proposed Kimberley West opencast mining permit. The applicable maps, tables and figures, are included as stipulated in the NHRA (no 25 of 1999), the National Environmental Management Act (NEMA) (no 107 of 1998). The HIA process consisted of three steps:

Step I – Literature Review: The background information to the field survey relied greatly on the Heritage Background Research.

Step II – Physical Survey: A physical survey was conducted on foot through the proposed project area by a qualified archaeologist and heritage specialist which was 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 heritage resources, the assessment of resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

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

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

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

A - No further action necessary;

B - Mapping of the site and controlled sampling required;

C - No-go or relocate development activity position;

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

E - Preserve site.

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

Site Significance

Site significance classification standards prescribed by the SAHRA (2006) and approved by the ASAPA for the Southern African Development Community (SADC) region, were used for the purpose of this report.

Table: Site significance classification standards as prescribed by SAHRA.

Field Rating	Grade	Significance	Recommended Mitigation
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	-	High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium Significance	Recording before destruction
Generally Protected C (GP.A)	-	Low Significance	Destruction

APPENDIX C

THE SIGNIFICANCE RATING SCALES FOR THE PROPOSED PROSPECTING ACTIVITIES ON HERITAGE RESOURCES

(a) Nature of the impact

The NATURE of an impact can be defined as: "a *brief description of the impact being assessed, in terms of the proposed activity or project, including the socio-economic or environmental aspect affected by this impact*".

(b) The status of the impact:

STATUS	Status	Description
	Positive (+)	**A benefit to the holistic environment.**
	Negative (-)	**A cost to the holistic environment.**
	Neutral (N)	**No cost or benefit to the holistic environment.**

(c) Magnitude of the impact

The MAGNITUDE of an impact can be defined as: "*a brief description of the intensity or amplitude of the impact on socio-economic or environmental aspects".*

Determining the magnitude of an impact			
MAGNITUDE	**Magnitude**	**Score**	**Description**
Magnitude / intensity of impact (at the specified scale)	**Zero**	**1**	**Natural and/or social functions and/or processes remain unaltered.**
	Very low	**2**	**Natural and/or social functions and/or processes are negligibly altered.**
	Low	**3**	**Natural and/or social functions and/or processes are slightly altered.**
	Medium	**4**	**Natural and/or social functions and/or processes are notably altered.**
	High	**5**	**Natural and/or social functions and/or processes severely altered.**

(d) Extent of the impact

The EXTENT of an impact can be defined as: "*a brief description of the spatial influence of the impact or the area that will be affected by the impact*".

Determining the extent of an impact			
EXTENT **Extent or spatial influence of impact**	**Extent**	**Score**	**Description**
	Footprint	**1**	**Only as far as the activity, such as footprint occurring within the total site area**
	Site	**2**	**Only the site and/or 500m radius from the site will be affected**
	Local	**3**	**Local area / district (neighbouring properties, transport routes and adjacent towns) is affected**
	Region	**4**	**Entire region / province is affected.**
	National	**5**	**Country is affected**

(e) Duration of the impact

The DURATION of an impact can be defined as: "*a short description of the period of time the impact will have an effect on aspects*".

Determining the duration of an impact			
DURATION **Duration of the impact**	**Extent**	**Score**	**Description**
	Short term	**1**	**Less than 2 years**
	Short to medium term	**2**	**2 – 5 years**
	Medium term	**3**	**6 – 25 years**
	Long term	**4**	**26 – 45 years**
	Permanent	**5**	**46 years or more**

(f) Degree to which impact can be reversed

The REVERSIBILITY of an impact can be defined as: *"the ability of an impact to be changed from a state of affecting aspects to a state of not affecting aspects*".

Determining the reversibility of an impact			
REVERSIBILITY	**Reversibility**	**Score**	**Description**
	Completely reversible	**1**	**Impacts can be reversed through the implementation of minimal mitigation measures and rehabilitation with negligible residual effects.**
	Nearly completely reversible	**2**	**Impacts can nearly be completely reversed through the implementation of mitigation measures and rehabilitation, with marginal residual effects.**
	Partly reversible	**3**	**Impacts can be partly reversed through the implementation of mitigation measures and rehabilitation with moderate residual effects.**
	Nearly irreversible	**4**	**Impacts can be mitigated, but only marginally reversed through the implementation of mitigation measures and rehabilitation with severe residual effects.**
	Irreversible	**5**	**Impacts are permanent and can't be reversed by the implementation of mitigation measures or rehabilitation is not viable.**

(g) Degree to which impact may cause irreplaceable loss of resources

The irreplaceability of an impact can be defined as "the amount of resources that can/can't be replaced".

Irreplaceability = Magnitude + Extent + Duration + Reversibility

Degree to which impact may cause irreplaceable loss of resources			
IRREPLACEABILITY	**Irreplaceability**	**Score**	**Description**
	No loss	**0**	**No loss of any resources**

Irreplaceable loss of resources	**Very Low**	**1 - 5**	
	Low	**6 - 10**	**Marginal loss or resources**
	Medium	**11 - 15**	**Significant loss of resources**
	High	**16 - 20**	**Complete loss of resources**

(h) Probability of the impact occurring

The PROBABILITY of an impact can be defined as: "the *estimated chance of the impact happening*".

Determining the probability of an impact			
PROBABILITY	**Probability**	**Score**	**Description**
	Unlikely	**1**	**Unlikely to occur (0 – 15% probability of impact occurring)**
	Possible	**2**	**May occur (15 – 40% chance of occurring)**
	Probable	**3**	**Likely to occur (40– 60% chance of occurring)**
	Highly Probable	**4**	**Between 60% and 85% sure that the impact will occur**
	Definite	**5**	**Will certainly occur (85 - 100% chance of occurring)**

(i) Significance of Impacts - Pre-Mitigation

The SIGNIFICANCE can be defined as:" *the combination of the duration and importance of the impact, in terms of physical and socio-economic extent, resulting in an indicative level of mitigation required*".

The significance of an impact is determined as follows:

Significance = Irreplaceability x Probability

The maximum value is 100 significance points (SP). Environmental impacts were rated as either of Very High (VH) High (H), Medium (M), Low (L) or Very Low (VL) significance on the following basis:

Table 6: Significance Rating (SR) Basis

Score	Significance
0	Neutral
1 to 20	Very low
21 to 40	Low
41 to 60	Medium
61 to 80	High
81 to 100	Very high

(j) Degree to which the impact can be mitigated

The degree to which an impact can be MITIGATED can be defined as: "the effect of mitigation measures on the impact and its degree of effectiveness".

MITIGATION POTENTIAL	Determining the mitigation potential of an impact		
	Degree	Calculation	Description
	High	Pre-mitigation SR / 3 = Post Mitigation SR	Impact 100% mitigated
	Medium	Pre-mitigation SR / 2 = Post Mitigation SR	Impact >50% mitigated
	Low	Pre-mitigation SR / 3 = x Then: Pre-mitigation SR – x = Post Mitigation SR	Impact <50% mitigated

(k) Significance of Impacts Post-Mitigation

The SIGNIFICANCE can be defined as:" *the combination of the duration and importance of the impact, in terms of physical and socio-economic extent, resulting in an indicative level of mitigation required*".

The significance of an impact is determined as follows:

Significance = Irreplaceability x Probability

Table 7: Significance Rating

Score	Significance
0	**Neutral**
1 to 20	**Very low**
21 to 40	**Low**
41 to 60	**Medium**
61 to 80	**High**
81 to 100	**Very high**

(l) Confidence rating

CONFIDENCE in the assessment of an impact can be defined as the:" *level of certainty of the impact occurring*".

Determining the confidence rating of an impact			
CONFIDENCE RATING	**CONFIDENCE**	**Certain**	**Amount of information on and/or understanding of the environmental factors that potentially influence the impact is unlimited and sound**
		Sure	**Amount of information on and/or understanding of the environmental factors that potentially influence the impact is reasonable and relatively sound**
		Unsure	**Amount of information on and/or understanding of the environmental factors that potentially influence the impact is limited**

(m) Cumulative impacts

The effect of CUMULATIVE impacts can be described as:" the effect the combination of past, present and "reasonably foreseeable" future actions have on aspects".

Determining the confidence rating of an impact			
CUMULATIVE RATING	**CUMULATIVE EFFECTS**	**Low**	**Minor cumulative effects**
		Medium	**Moderate cumulative effects**
		High	**Significant cumulative effects**

APPENDIX D

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* -

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 and the Democratic Republic of the Congo

JENNIFER KITTO

Heritage Specialist

Name:	Jennifer Kitto
Profession:	Heritage Specialist
Date of Birth:	1966-09-11
Parent Firm:	PGS Heritage (Pty) Ltd
Position in Firm:	Heritage Consultant
Years with Firm:	6 Years
Years experience:	20
Nationality:	South African
HDI Status:	White Female

EDUCATION:

Name of University or Institution	**:**	Dorset Institute for Higher Education (now Bournemouth University), Poole, United Kingdom
Degree obtained:	:	Higher National Diploma: Practical Archaeology
Year	**:**	1989
Name of University or Institution	:	University of the Witwatersrand
Degree obtained	:	BA
Major subjects	:	Archaeology and Social Anthropology
Year	:	1993
Name of University or Institution	:	University of the Witwatersrand
Degree obtained	:	BA [Hons]
Major subjects	:	Social Anthropology
Year	:	1994

Professional Qualifications:
Member - Association of Southern African Professional Archaeologists – Technical Member No. 444

Languages:
English
Afrikaans - Speaking (Fair) Reading (Fair), Writing (Fair)

KEY QUALIFICATIONS

Cultural Resource Management and Heritage Impact Assessment Management, Historical and Archival Research, Archaeology, Anthropology, Applicable survey methods, Fieldwork and Project Management.

Summary of Experience

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

Limited involvement in various grave relocation projects 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
- Heritage Audits and subsequent Compilation of Heritage Management Policy for various projects

HERITAGE ASSESSMENT PROJECTS

Below a selected list of Heritage Impact Assessments (HIA) and Heritage Audit and Management Projects completed:

- Heritage Screening Reports for Various Road Routes: Bronkhorstspruit, Carletonville and Randfontein and Eikenhof-Vaal Dam regions, Gauteng Department of Roads and Transport, Gauteng Province
- Heritage Audit and Management Policy, Sibanye Gold, Beatrix Mining area, Lejweleputswa District Municipality, Free State Province
- Heritage Audit and Management Policy, Sibanye Gold, Kloof and Driefontein Mining areas, West Rand District Municipality, Gauteng Province
- HIA Report, Dolos-Giraffe Substation, Hopefield-Bultfontein, Free State Province
- HIA Report and Phase 2 Mitigation Report, AEL Mining Services, Decontamination of AEL Detonator Campus, Modderfontein Factory, Modderfontein, City of Johannesburg Metropolitan Municipality, Gauteng
- HIA Report, Old Rand Leases Hostel redevelopment, Fleurhof Ext 10, Roodepoort, City of Johannesburg Metropolitan Municipality, Gauteng
- HIA Report, Watershed Substation, North-West Province
- HIA Report, Solid Waste Landfill Facility, Rhodes Village, Eastern Cape
- HIA Report, Solid Waste Landfill Facility, Rossouw, Eastern Cape
- Phase 2 Mitigation Report, Cass Farmstead, Optimum Colliery, Mpumalanga
- HIA Report, Kusile Ash Disposal Facility, Witbank, Mpumalanga
- Report on Rand Steam Laundries Background History, City of Johannesburg Metropolitan Municipality, Gauteng
- New Cemetery, Barkly East, Senqu Municipality, Eastern Cape (desktop/archival research for HIA report)
- Lady Slipper Country Estates, Nelson Mandela Metro Municipality, Eastern Cape (desktop/archival research for HIA report)
- Exxaro Resources Paardeplaats Project, Belfast, Mpumalanga (field survey and archival research for HIA report)
- Copperleaf Mixed Use Development, Farm Knoppieslaagte 385/Knopjeslaagte 140, Centurion, Gauteng (field survey and archival research for HIA report)

- Isundu-Mbewu Transmission Line Project, Pietermaritzburg, Kwazulu Natal (Initial Heritage Scan (survey) for Corridor 3 Alternative 1)

GRAVE RELOCATION PROJECTS

Below, a selection of grave relocation projects completed:

- Mitigation Report on previous Grave Relocation and Permit applications for Test Excavation of two possible graves, Nkomati Mine, Mpumlanga
- Relocation of two graves Olievenhoutbosch, Tshwane, Gauteng (applications to SAHRA, Gauteng Dept. of Health and Local Authorities for relevant permits)
- Relocation of graves HL Hall Family, Nelspruit, Mpumalanga (applications to SAHRA, Mpumalanga Department of Health and Local Authorities for relevant permits)
- Relocation of two possible graves Noordwyk Ext 63, Midrand, Johannesburg, Gauteng (applications to SAHRA, Gauteng Dept. of Health and Local Authorities for relevant permits)
- Relocation of informal cemetery (50+) and additional unknown graves (50+) at Fleurhof Extension 5, Roodepoort, Gauteng (desktop research and applications to SAHRA, Gauteng Health Department and Local Government for relevant permits in terms of the applicable legislation)
- Relocation of informal graves (9) at Tselentis Colliery, Breyten, Mpumalanga (applications to SAHRA, Mpumalanga Department of Health and Local Authorities for relevant permits)
- Relocation of various informal cemeteries at New Largo Mine, Balmoral, Mpumalanga (as above)
- Relocation of graves at Mookodi Power Station, Vryburg, North-West Province (initial social consultation)
- Relocation of graves at Hendrina Power Station, Hendrina, Mpumalanga (social consultation, permit applications, etc)

EMPLOYMENT SUMMARY:

Positions Held

- **2011 – to date**: Heritage Specialist - PGS Heritage (Pty) Ltd
- **2008 – 2011**: Cultural Heritage Officer (National), Burial Grounds and Graves Unit: South African Heritage Resources Agency (SAHRA)
- **1998 – 2008**: Cultural Heritage Officer (Provincial), Provincial Office – Gauteng: SAHRA

ILAN SMEYATSKY
Professional Archaeologist

Personal Details

- **Name:** Ilan
- **Surname:** Smeyatsky
- **Identity Number:** 9109275072080
- **Date of Birth:** 27-09-1991
- **Citizenship:** South African
- **Gender:** Male
- **Marital Status:** Single
- **Languages Spoken**: English

Education History
2010-2013: **BSc Bachelors Degree**

University of the Witwatersrand, Johannesburg, South Africa

- Archaeology
- Psychology
- Statistics
- Research Design and Analysis
- 67% Pass (**2:1 Qualification**)

2014: **BSc (Hons) in Archaeology**

AWARDS:

- Received the 2014 Center of Excellence in Palaeoscience award - **Bursary to the value of ZAR 30000 ≈ $2500**
- Received the Post-Graduate Merit Award in 2015 for academic merit for my Honours academic results - **Bursary to the value of ZAR 25000 ≈ $1800**

University of the Witwatersrand, Johannesburg, South Africa

- Archaeology
- Excavation techniques
- Theory
- 69% Pass (**2:1 Qualification**)
- **Distinction** received for thesis entitled: "Stylistic variation in Later Stone Age tanged arrowheads: a pilot study using geometric morphometrics"

2015-2017: **MSc by Research (Archaeology)**

University of the Witwatersrand, Johannesburg, South Africa

- Archaeology
- Statistical analysis
- GIS (Geographic Information Systems)
- Thesis entitled: "Discerning and explaining shape variations in Later Stone Age tanged arrowheads, South Africa"

Aug 2016 –
Jan 2017: **Semester of Archaeology Masters**

AWARD: Received the 2016 AESOP+ full Masters scholarship to study at Uppsala University, Uppsala, Sweden – **Scholarship to the value of ZAR 160,000 ≈ $11,000**

Uppsala University, Uppsala, Sweden

- Archaeological theory
- GIS (Geographic Information Systems)
- Invitational research

Employment History

Part time employment as a student:

- **2009-2013**: Part-Time Electrician Apprentice: Assisting in home electrical repair jobs.
- **2014-2015:** Lab Research Assistant: Analysing and classifying lithic artefacts, Data capturing, Mentoring trainee research assistants.

Experience in the field of archaeology:

- **2013-2015: Fieldwork/Excavator - Responsibilities:** Feature detection, excavation, sieving, sorting, analysis, soil sampling, field documentation, 'dumpy' operation , Total Station operation, DGPS operation, rock art tracing and photography, engraving tracing and photography.
    - South African excavations:
        - Early Stone Age excavation at Maropeng World Heritage Site in Gauteng (1 Week – August 2015)
        - Pig cadaver exhumation as part of forensic experiment near Pretoria, Gauteng (1 Week – December 2014) - Praised for having the determination of returning for each subsequent excavation day as it was performed on a purely volunteer basis and the work conditions were particularly strenuous - Dr. Coen Nienaber
        - Iron Age excavation at Komati Gorge, Mpumalanga (1 Week – August 2014) - Praised for being exceptionally "methodical and proficient" with my excavation techniques – Dr. Alex Schoeman
        - Rock art fieldwork at Komati Gorge, Mpumalanga (1 Week – August 2014)
        - Underwater archaeology site mapping Komati Gorge, Mpumalanga (1 Week – August 2014)
        - Early Stone Age excavation at Maropeng World Heritage Site in Gauteng (2 Weeks - September 2013) - Personally uncovered some of the only stone tools (~1.8 million years old) found during that digging season.
- **2016: Excavation Supervisor - Responsibilities:** Supervision of two junior excavators, site detection, decision of excavation grid placement, excavation, sieving, sorting, soil sampling, field documentation.
        - Historical (farm site) excavation at Graaff-Reinet, Eastern Cape, South Africa (2 Weeks)
        - Completed dig 1 week ahead of schedule aided by my efficient direction, drive and support to the excavators under my supervision.
- **2017 – PRESENT:** Intern Archaeologist – PGS Heritage: Heritage Impact assessments, background research, report writing, permit applications, collections management, stakeholder engagement and grave relocation.
- **2018 - PRESENT:** Junior Archaeologist – PGS Heritage: Heritage Impact assessments, background research, report writing, permit applications, collections management, stakeholder engagement and grave relocation.