Kophia Diamonds (Pty) Ltd

Catherine's Fancy 831, which forms part of the Blaauwbosch Mine, Boshof District, Free State Province

Heritage Impact Assessment

Issue Date: 30th July 2018
Revision No.: 0.1
Project No.: 316GR (316HIA)

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Declaration of Independence

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

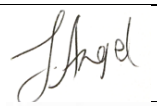
Disclosure of Vested Interest

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

HERITAGE CONSULTANT: PGS Heritage (Pty) Ltd
CONTACT PERSON: Project Manager – Henk Steyn
Tel: +27 (0) 12 332 5305
Email: henk@pgsheritage.co.za

SIGNATURE: _____

ACKNOWLEDGEMENT OF RECEIPT

Report Title	*Heritage Impact Assessment: Catherine's Fancy 831, which forms part of the Blaauwbosch Mine, Boshof District, Free State Province*		
Control	**Name**	**Signature**	**Designation**
Author	**J Angel**		Senior Archaeologist
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Reviewed			

CLIENT: **Kophia Diamonds (Pty) Ltd**

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EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd was appointed by Kophia Diamonds (Pty) Ltd to undertake a Heritage Impact Assessment (HIA) for existing mining activities in operation on the farm Catherine's Fancy, which forms part of the Blaauwbosch mine, in the Boshof District of the Free State Province. The HIA is necessitated by the discovery of skeletal material during the course of mining activities on the farm Catherine's Fancy.

The Heritage Impact Assessment has shown that the Blaauwbosch Diamond Mine has heritage resources present on the affected properties. This has been confirmed through a field survey, archival research and evaluation of aerial photography of the sites.

Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant. This report focuses expressly on the area affected by current mining activities, other management measures as listed and required in other HIA's conducted in the area must still be implemented for other heritage features identified in the larger mining area.

The HIA has shown that the Kophia Diamond Mine has heritage resources present on the affected properties. This has been confirmed through a field survey, archival research and evaluation of aerial photography of the sites.

During the field assessment, seven heritage resources were located, not including the accidentally discovered burial ground. These include three Middle Stone Age sites (**207, 208** and **212**) and four historical structures (**209, 210, 211** and **213).**

These sites have LOW heritage significance and no further mitigation measures are required, **except that a permit from SAHRA is required if the mining activity is expected to destroy the three MSA sites.**

The burial ground is currently undergoing a full grave relocation process.

It is my considered opinion that overall impact on heritage resources after the implementation of the recommended mitigation measures is acceptably low and that 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 30 000 years associated with fully modern people.

Late Iron Age (Early Farming Communities)

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

Middle Stone Age

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

Palaeontology

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

Abbreviations	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
ECO	Environmental Control Officer
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency

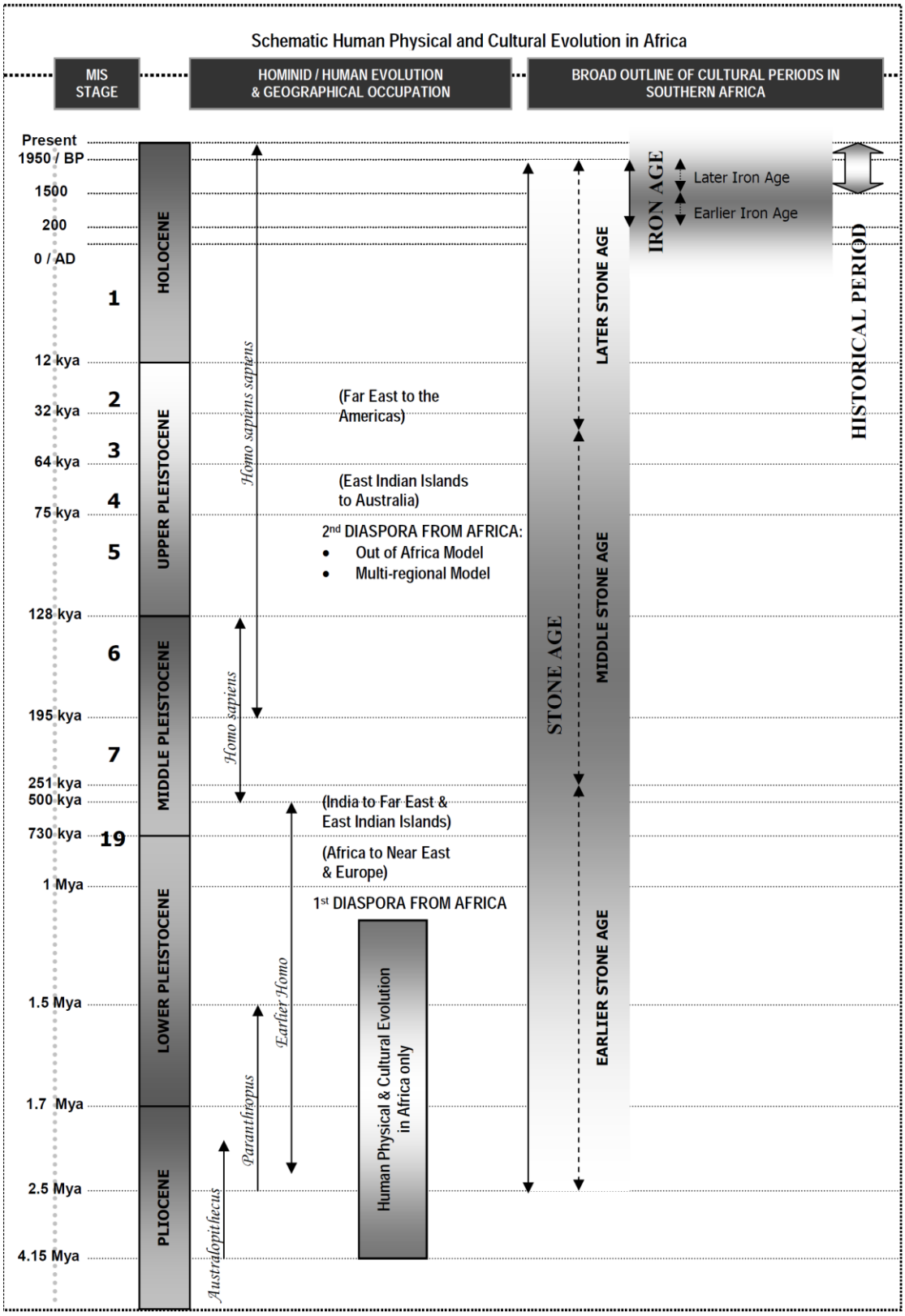

Figure 1 – Human and Cultural Time line in Africa (Morris, 2008)

1 INTRODUCTION

PGS Heritage (Pty) Ltd was appointed by Kophia Diamonds (Pty) Ltd to undertake a Heritage Impact Assessment (HIA) for existing mining activities in operation on the farm Catherine's Fancy, which forms part of the Blaauwbosch mine, in the Boshof District of the Free State Province. The HIA is necessitated by the discovery of skeletal material during the course of mining activities on the farm Catherine's Fancy.

1.1 Scope of the Study

The aim of the study is to identify possible heritage sites and finds that may occur in the proposed mining area. The HIA aims to inform and assist the landowner in managing the discovered 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).

1.2 Specialist Qualifications

This HIA Report was compiled by PGS Heritage (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.

Linereè de Jager, the Project Coordinator/Manager, is a qualified archaeologist and anthropologist. She holds a BA (Hons) degree in Archaeology from the University of South Africa (Unisa) Since working for PGS she has specialised in the relocation of numerous informal burial grounds in South Africa and Mozambique and she has conducted various archaeological surveys, monitoring and mitigations. She is a registered Professional Archaeologist with the Association of Southern African Professional Archaeologists (ASAPA) with CRM accreditation as Field Supervisor for Stone Age, Iron Age and Grave Relocation and Field Director for Grave Relocation.

Jessica Angel, Senior Archaeologist and author of this report, holds a Master's degree in Archaeology and is registered as a Professional Archaeologist with ASAPA.

Jennifer Kitto, Heritage Specialist and co-author, 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.

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 mining activities. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must be contacted immediately.

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.

The field survey covered the area of 121 ha. Most of the surface area on the farm Catherine's Fancy 831 has been used for mining operations since before the 1930s (pers.com). Large areas have been used for soil dumping and various different areas have been excavated.

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.

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Locality

The Kophia Diamond Mine is located approximately 22 km east of Boshof, 50 km south of Hertzogville and 35 km north west of Dealesville. The project site is 121 ha in extent and is located within the Lejweleputswa District Municipality, Free State Province. The following properties form part of the project sites: Catherine’s Fancy 831 and portion 4 of the farm Blaauwboschfontein 229.

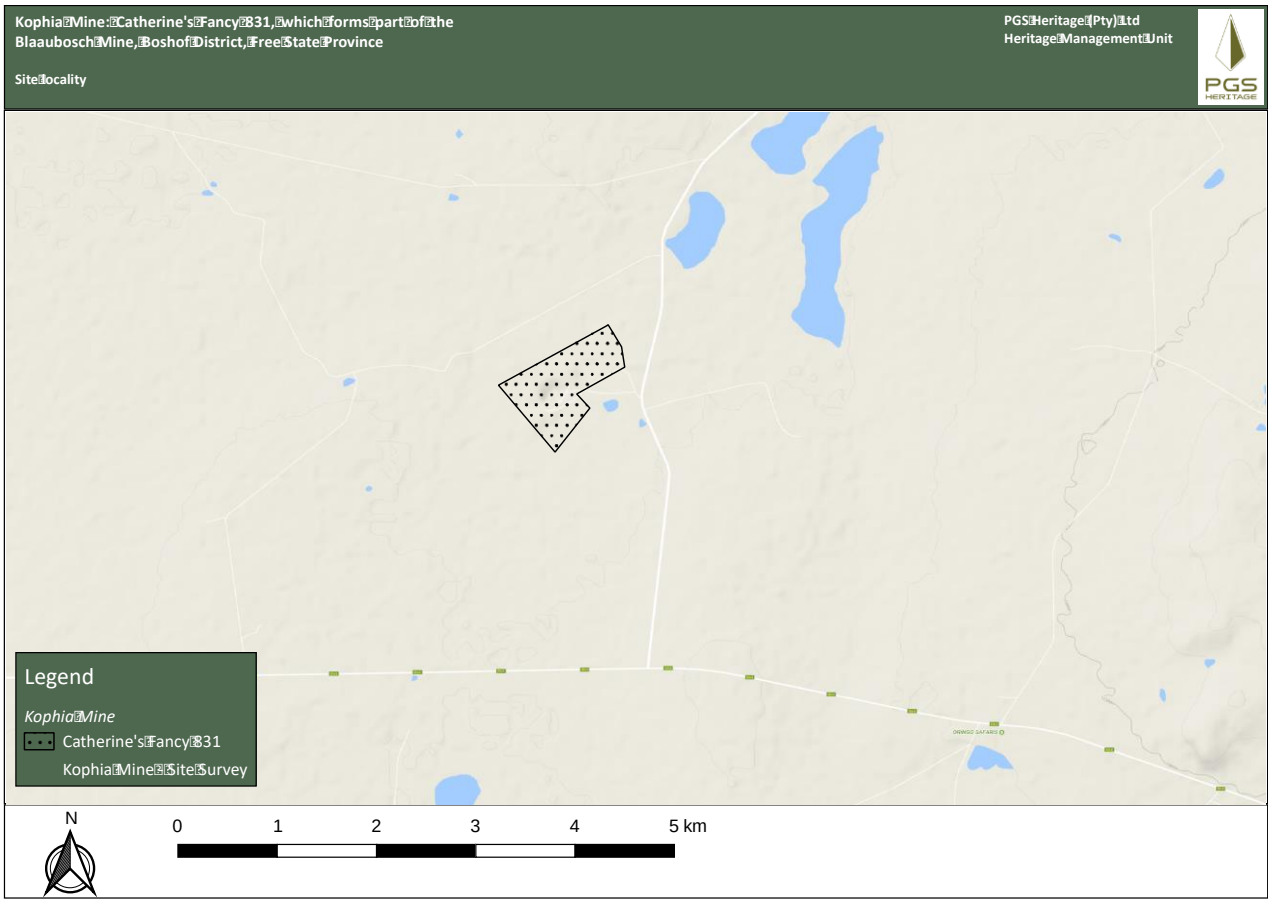

Figure 2 – Kophia Diamond mine - Locality

2.2 Technical Project Description

Kophia Diamonds (Pty) Ltd holds the right to mine Catherine's Fancy as per the EMP (dated February 2002). The EMP report states that the mining venture was divided into two phases. Phase One involved the re-mining of the old tailings dumps already existing on the site. Phase Two involves the mining of the Kimberlite pipe, which will be mined using inclined chambering.

During mining operations in 2018, human remains from five accidentally discovered graves were uncovered. This discovery necessitated that the mining activities be halted and for an investigation of the graves to be undertaken. An application for the relocation of the uncovered graves is also required. This Heritage Impact Assessment forms part of the investigation and will be attached to the relocation permit application. The aim of the HIA is to assess the remaining property and confirm the existence of any other possible heritage sites or burial grounds.

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 current mining activities at Kophia Diamond Mines. 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 a field technician from PGS, 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 mining operations 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 1 - 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 impact assessment methodology is guided by the requirements of the NEMA EIA Regulations (2014). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/likelihood (P) of the impact occurring. This determines the environmental risk. In addition other factors, including cumulative impacts, public concern, and potential for irreplaceable loss of resources, are used to

determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S).

3.2.1 Determination of Environmental Risk:

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER).

The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and reversibility (R) applicable to the specific impact.

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

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

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in **Table 2**.

Table 2 - Criteria for Determining Impact Consequence

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years),
	3	Medium term (6-15 years),
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),

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

Once the C has been determined, the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/scored as per **Table 3**

Table 3: Probability Scoring

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

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows **(Table 4): ER= C x P**

Table 4 - Determination of Environmental Risk

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

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes, as described in **Table 5**.

Table 5: Significance Classes

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

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

3.2.2 Impact Prioritisation:

In accordance with the requirements of Appendix 3(3)(j) of the 2014 EIA Regulations (GNR 982), and further to the assessment criteria presented in the Section above, it is necessary to assess each potentially significant impact in terms of:

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

In addition, it is important that the public opinion and sentiment regarding a prospective development and consequent potential impacts is considered in the decision making process.

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

Table 6: Criteria for Determining Prioritisation

Public response (PR)	Low (1)	Issue not raised in public response.
	Medium (2)	Issue has received a meaningful and justifiable public response.
	High (3)	Issue has received an intense meaningful and justifiable public response.
Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable loss of resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in **Table 7**. The impact priority is therefore determined as follows:

Priority = PR + CI + LR

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 2 (Refer to **Table 7**).

Table 7: Determination of Prioritisation Factor

Priority	Ranking	Prioritisation Factor
3	Low	1
4	Medium	1.17
5	Medium	1.33

6	Medium	1.5
7	Medium	1.67
8	Medium	1.83
9	High	2

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

Table 8: Final Environmental Significance Rating

Environmental Significance Rating	
Value	**Description**
< 10	Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
≥10 <20	Medium (i.e. where the impact could influence the decision to develop in the area),
≥ 20	High (i.e. where the impact must have an influence on the decision process to develop in the area).

4 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.

4.1 Archaeological background

The examination of heritage databases, historical data and cartographic resources represents a critical additional tool for locating and identifying heritage resources and in determining the historical and cultural context of the study area. Therefore, an Internet literature search was conducted, and relevant archaeological and historical texts were also consulted. Relevant topographic maps and satellite imagery were studied.

4.1.1 South African Heritage Resources Information System (SAHRIS)

A scan of SAHRIS has revealed the following studies conducted in and around the study area of this report:

- Dreyer, C. 2004: Archaeological and Historical investigation of the Proposed Residential Area at Boshof, Free State. Sites located include historical structures and LSA material.

- Dreyer, C. 2008: First Phase Archaeological and Cultural Heritage Assessment of the Proposed Leisure Residential Developments at the Farms Serfonteinshoop 43, Napier 662 & Garvoch 367, Boshof, Free State. LSA sites were located.

- Hutten, M. 2011: Heritage Impact Assessment for the proposed Boshof Solar Park on the Farm Rabenthal north of Boshof, Free State Province. MSA and LSA artefacts were located.

- Van Vollenhoven, A.C. 2014: Heritage Scoping Report Related to the Eskom Kimberly Strengthening Phase 4 Project between the BETA and Boundary Substations in the Northern Cape Province. Burial grounds and a LIA/historical site were located.

- Dreyer, C. 2015: First Phase Archaeological and Heritage Assessment of the Proposed Riverton – Boshof – Dealesville Water Pipeline, Free State. A burial ground was located.

- Orton, J. 2015: Heritage Impact Assessment: Eleven Solar PV Facilities and Supporting Electrical Infrastructure near Dealesville in the Free State Province Proposed by Mainstream Renewable Power Developments. Rock engravings, Historical structures, burial grounds and Stone Age artefacts were located.

- Orton, J. 2016: Heritage Impact Assessment: Scoping and Environmental Impact Assessment for the Proposed Development of the Marconi PV 100 MW Photovoltaic Facility near Dealesville, Free State. Burial Grounds, historical ruins and Stone Age artefact scatters were located.

- Morris, D. 2016: Heritage Impact Assessment for the Proposed Drilling Site on the Farm Deelpan 314 near Dealesville, Western Free State. Historical sites and Stone Age material was located.

- Tomose, N. 2018: Proposed Construction of a 15,5 km Single-circuit BPBH and KDLO Interconnector 22KV Powerline near Boshof. MSA artefacts were located.

4.1.2 Historical and Archaeological overview of the study area and surrounding region

DATE	DESCRIPTION
2.5 million to 250,000 years ago	The Earlier Stone Age is the first and oldest phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these technological phases is known as Oldowan which is associated with crude flakes and hammer stones and dates to approximately 2 million years ago. The second technological phase in the Earlier Stone Age of Southern Africa is known as the Acheulian and comprises more refined and better made stone artefacts such as the cleaver and bifacial handaxe. The Acheulian phase dates back to approximately 1.5 million years ago.
250,000 to 40,000 years ago	The Middle Stone Age is the second oldest phase identified in South Africa's archaeological history. It is associated with flakes, points and blades manufactured by means of the prepared core technique. No sites dating to the MSA are known in the larger study area. However, several MSA sites are known in the greater Region; the most well-known being Florisbad, where many stone tools and fossils have been found, including parts of a cranium of a fossil hominin – Florisbad Man (Archaic Homo Sapiens) (Kuman & Clark, 1986).
40,000 years ago to the historic past	The Later Stone Age is the third phase in South Africa's Stone Age history. It is associated with an abundance of very small stone artefacts (microliths). The Munro Site found by Revil Mason during his survey of the Oppermansdrift Dam (see above) also included a Later Stone Age component (Mason, 1969).
Rock Art	The Later Stone Age is also associated with rock engravings and rock paintings. Rock engravings are known from the direct and wider vicinity of the study area (Bergh, 1999). The two closest rock art sites in the general area include Spitskop and Stowlands. Spitskop is located 12 km west of Verkeerdevlei on the link road to the N1 in the Brandfort District. The Spitskop site consists of three San or 'Bushman', as well as Khoe or 'Khoi' rock-engraving sites located on adjacent farms. These sites are all within sight of the 1580 m high sandstone mountain known as Spitskop. There are images of eland – one is 1.35 m long – geometric forms, human figures, and ostrich. It is regrettable to note that the last gathering and hunting San was shot 15 km from the farm in the 1860s (Ouzman, S. 2001). The Stowlands site is located 4 km from Christiana, to the east on the R708, in the direction of Boshof. Over 320 Bushman and Khoe rock engravings are scattered on the summit of a hill overlooking the Vaal River. The engravings include elephant, giraffe, rhino, human figures, spirit-world animals and geometric motifs. Stowlands is one of South Africa's Rock Art Provincial Heritage sites (Ouzman, S. 1998; http://www.nasmus.co.za/departments/rock-art/public-rock-art-sites)
AD 400 –- 1100	The Early Iron Age (EIA) period in South Africa was introduced by the expansion of early farmers during the first millennium AD. The Iron Age is that period in South

	Africa's archaeological history associated with pre-colonial farming communities associated with agricultural and pastoralist farming activities, metal working, cultural customs such as lobola, as well as settlement pattern known as the Central Cattle Pattern. (Huffman, 2007). No sites dating to the Early Iron Age have been recorded in the study area.
1500 – 1700	This period is associated with a Late Iron group referred to as the Olifantspoort facies of the Urewe Tradition. The Olifantspoort facies originated from the Icon facies (AD1300 – 1500) and led to the Thabeng facies (AD1700 – 1840) (Huffman, 2007). The Olifantspoort facies (with the Letsibogo facies in Botswana and the Madikwe facies in the area between Makapansgat and Botswana) represents the second phase in the development of Moloko and were represented by an absence of any stonewalling. Olifantspoort pottery is characterised by "multiple bands of fine stamping or narrow incision separated by colour" (Huffman, 2007:193).
1700 – 1820	This period is associated with the Late Iron Age group known as the Thabeng facies of the Urewe Tradition. As indicated above this facies followed on the Olifantspoort facies as the third facies in the development of Moloko in this area. The Thabeng pottery is characterised by "incised triangles, coloured chevrons and arcades" (Huffman, 2007:197) whereas the settlements are stonewalled. Their layout conformed to Type Z settlements which can be described as "...a loose circle of individual bilabial households surrounding the core..." (Huffman, 2007:41).
1795	During this time Legassick (2010) indicates that the study area fell within the Rolong sphere of influence. Before this time the Rolong were mainly settled south of the Vaal River. Under their leader Tau (c. 1700 – 1760) they were a strong group with a vast sphere of influence and in control of strong trade networks. However, after his death the Rolong moved northward to settle along the headwaters of the Molopo River. The period after Tau's death saw fissures develop which (after the death of Tau's son Ratlou and in turn the death of his son Seitshiro) led to the division of the once united Rolong into at least five groups, namely the Rolong-Mariba, Rolong-Ratlou, Rolong-Tshidi, Rolong-Seleka and Rolong-Rapulana. In roughly 1790 the Rolong-Seleka, followed by the Rolong-Rapulana, left the Molopo River to settle at Thabeng near Klerksdorp (Legassick, 2010).
Early 1820s	During the early 1820s, Burchell records the Tlhaping at Dithakong, the missionary Broadbent records the Rolong on top of the Platberg (at Thabeng) and the Kubung were associated with several localities in the Free State. These three groups form a South-western Sotho-Tswana cluster which can be associated with Thabeng pottery and Type Z walling (Huffman, 2007).
1823-1826	As a result of increasing numbers of raiding groups crossing over the Vaal River from the south as part of the social dynamics of the Difaqane, the Rolong-Seleka abandoned their settlement at Thabeng and moved along the northern bank of the Vaal River in a western direction.

	The first Europeans to move into the area were two explorers named Hodgson and Archbell in 1826, followed by Krebs in 1838 (Berg,1999)
1869	With the establishment of the Bloemhof District, the entire study area now fell within this district (Bergh, 1999).
April - June 1871	An arbitration commission held hearings in Bloemhof during this period. The commission was asked to provide an arbitrated solution to the exact position of the western boundary of the Zuid-Afrikaansche Republiek. It came as a result of increasing levels of disagreement and discontent between the Z.A.R. on the one hand, and the Rolong, Tlhaping and the Koranna (amongst others) on the other. The commission comprised the British magistrate at Klipdrif, John Campbell and the Z.A.R. magistrate of Wakkerstroom, A.A. O' Reilly. When the two individuals failed to reach an agreement, the Lieutenant-Governor of Natal, R.W. Keate, was asked to provide the final recommendations of the commission. In the vicinity of the study area the Keate Award (as Keate's findings are referred to) defined the western boundary of the Z.A.R. along the Makwassie Stream (Bergh, 1999).
1839-1850s	The town of Boshof was named after Johannes Nicolaas Boshof, the second president of the Orange Free State (1855-59) and founder of the republic's civil service. The town was established on the farm Van Wyksvlei which was bought in 1839 by Dawid Fourie from Koranna chief David Danster. By the early 1850s, a number of white farmers had settled in the lower Modder River Valley and they then bought the farm in 1855 for the purposed of establishing a parish and a village. Subsequently, in 1856, the Volksraad of the republic added a large area to the townlands and the first residential stands were surveyed. Boshof became a municipality in 1872 (Erasmus, 2014).
1881	After the end of the Anglo-Transvaal War (also referred to the First Boer War) which terminated the two-year British annexation of the Z.A.R., the Pretoria Convention of 1881 redefined the western boundary of the Z.A.R. The recommendations of the convention were largely based on the investigations undertaken by Lieutenant-Colonel C.J. Moysey who had been appointed by the British government during the previous year to investigate the Keate Award of 1871 through map surveys and field assessments. According to the recommendations of the Pretoria Convention the western boundary of the Z.A.R. was moved from the Makwassie Spruit to roughly the Harts River. In 1884 the western boundary of the Z.A.R. was again moved further west as a result of the recommendations of the London Convention (Bergh, 1999).
1899	The town Dealesville was proclaimed on 20 July 1899, after the farm Klipfontein was bought. The town was named after the owner of the farm, John Henry Deale. The town became a municipality in 1914 (Erasmus, 2014).
1899-1902	A number of significant events can be associated with the general vicinity of the study area during the Second South African War.

	The town of Boshof saw intense activity during the British march towards the two capitals of the Boer Republics. On the 12th of March 1900 the town was occupied by British forces under command of Lord Methuen and a garrison was installed in the town (Farwell, 1999; Cloete, 2000). The exact location of the garrison is not known and remnants of it may still exist somewhere in the town. On the 5 of April 1900 a battle took place just outside of Boshof, on the farm Tweefontein, also commonly referred to as 'The Battle of Boshof', which resulted in a British victory and the death of General De Villebois-Mareul (Farwell, 1999; Cloete, 2000; Grobler, 2004). The period between April and May of 1900 saw a number of skirmishes in the area surrounding the town and was followed by several more skirmishes during the guerrilla phase of the war (late 1900-1902) (Farwell, 1999; Cloete, 2000; Grobler, 2004). An official report on the 30th of April 1902 states that the block house line between Kimberly and Theunissen, via Boshof as well as the line between Boshof and Hoopstad was completed (Cloete, 2000). Therefore, remnants of these blockhouses may still exist in areas within and surrounding Boshof (Hutten, 2011).  *Figure 3- Boshof cemetery, showing the graves of British casualties of the Second South African War (http://boshof.co.za/History.htm)*
1906 - 1910	After the monopolisation of the Kimberley diggings in 1880, many of the independent diamond diggers started working their way northward along the Vaal River. In 1906 they had reached the town of Christiana and when these diggings faltered after a year or two, the diggers reached the vicinity of Bloemhof in 1908. Although the Bloemhof diggings yielded only 783 carats in 1909, the following year saw the doubling of earnings (Van Onselen, 1996).
1911-1913	The discovery and proclamation of an extensive diamond field at Mooifontein (north-west of Bloemhof) in 1911 attracted roughly 5,000 people to these diggings with other 1,200 fortune seekers setting their sights on the Bloemhof townlands. By

	the end of the year the two fields had yielded more than 37,000 carats, a yield that was maintained for the following two years as well (Van Onselen, 1996).
1914-1918	**First World War**: Even before the outbreak of the First World War in 1914, the Union of South Africa's responsibility to Britain in such a war was the subject of a heated debate for quite some time. With the outbreak of hostilities the South African Government of General Louis Botha notified Britain of their willingness to assist in the war effort. Many of the Afrikaans people found it intolerable that South Africa should assist their erstwhile enemy in her international conflicts and against a country with which they still had very strong ties. Subsequently, many of them rose up in armed rebellion under the leadership of former Boer Generals such as Christiaan de Wet and J.C.G. Kemp and General Christiaan Frederik Beyers, who at the time was the commander of the Union Defence Force. After resigning his post he became one of the leaders of the rebellion. Van Onselen (1996) indicates that on 1 November 1914, a skirmish took place between rebels under the command of P.J.K. van Vuuren and government troops on the farm Zoutpan 212 HO. This farm is located roughly south-east of the study area.

4.1.3 Brief History of the farm Blaauwboschfontein

The first diamond known to be discovered on "dry" land was on the farm Koffiefontein in the Orange Free State in July 1870. This farm was situated approximately 90 kilometres south-east of Klipdrift at the river diggings.127 The next important discovery was also in the Orange Free State, on the farm Jagersfontein, situated approximately 60 kilometres south east of the farm Koffiefontein. Towards the end of 1870, most of the river diggings had been exhausted and rumours spread that the owner of the farm Dutoitspan, situated approximately 40 kilometres south of Klipdrift, had found diamonds embedded in the walls of his farm house. By 1871, more diamonds were discovered on the farms Dutoitspan, Bultfontein, Vooruitzigt and at a koppie, named Colesberg Kopje (which became the Kimberley 'Big Hole'). These areas were referred to as the "dry diggings" and the diamonds could, in some instances, be found on the surface of the land (Higgs, 2017).

Three diamond mines were established in the Boshof district, namely the Roberts Victor Mine which was discovered on the farm Damplaats in 1905, the Blaauwbosch Mine which was discovered on the farm Catherine's Fancy and the New Elands Mine which was discovered on the farm New Elands (Higgs 2017).

Blaauwbosch Diamonds Ltd Inc was registered in the Orange Free State in 1908 as Blaauwbosch Diamond and Development Syndicate Ltd. In April 1910, the name of the company was changed

to Blaauwbosch Diamonds Ltd Inc. The company was in liquidation in 1925 (International Stock Exchange of the United Kingdom and Republic of Ireland Ltd.1990. Register of Defunct Companies. Macmillan Publishers Ltd).

4.1.4 Archival/historical maps

As the property has been mined since 1908, the topographic maps showed little heritage features other than mining related infrastructure. The 1971 First edition 1:50000 map below, (air photography 1965, surveyed in 1971 and drawn in 1972 by the Trigonometrical Survey Office) depicts several structures located on the property. The heritage resources identified during this HIA survey have been included to show which historical features were identified. As noted in section **0,** structures were located which correspond to the map below.

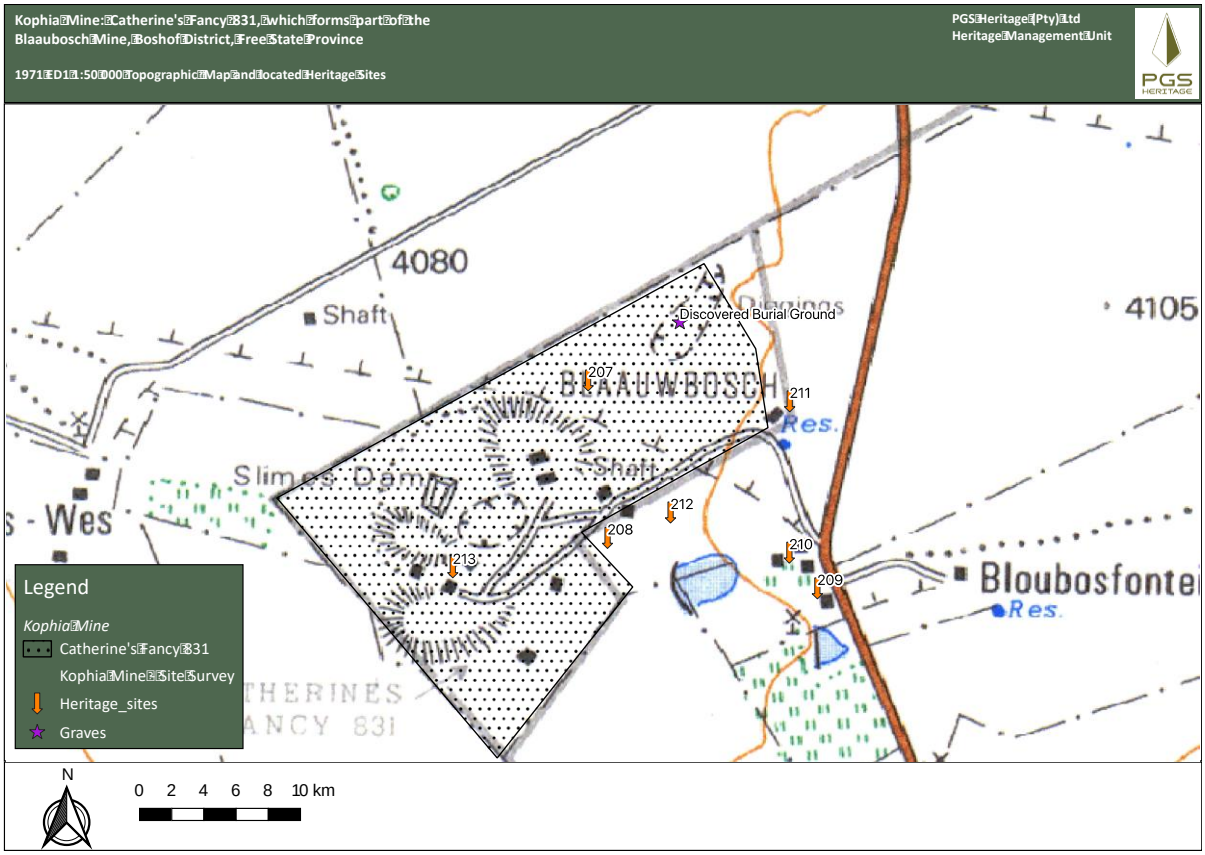

Figure 4 – 1971 First Edition, 1:50000 Topographic map with Heritage Features

5 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 over a period of two days by vehicle and on foot by one archaeologist and a field technician from PGS. The fieldwork was conducted from the 9th – 10th of July 2018. The fieldwork was logged with a GPS receiver and all finds were marked (Refer to **Figure 5** and **Figure 6**)

During the field assessment, seven heritage resources were identified, not including the accidentally discovered burial ground. These include three Middle Stone Age sites (**207, 208** and **212**) and four historical structures (**209, 210, 211** and **213).**

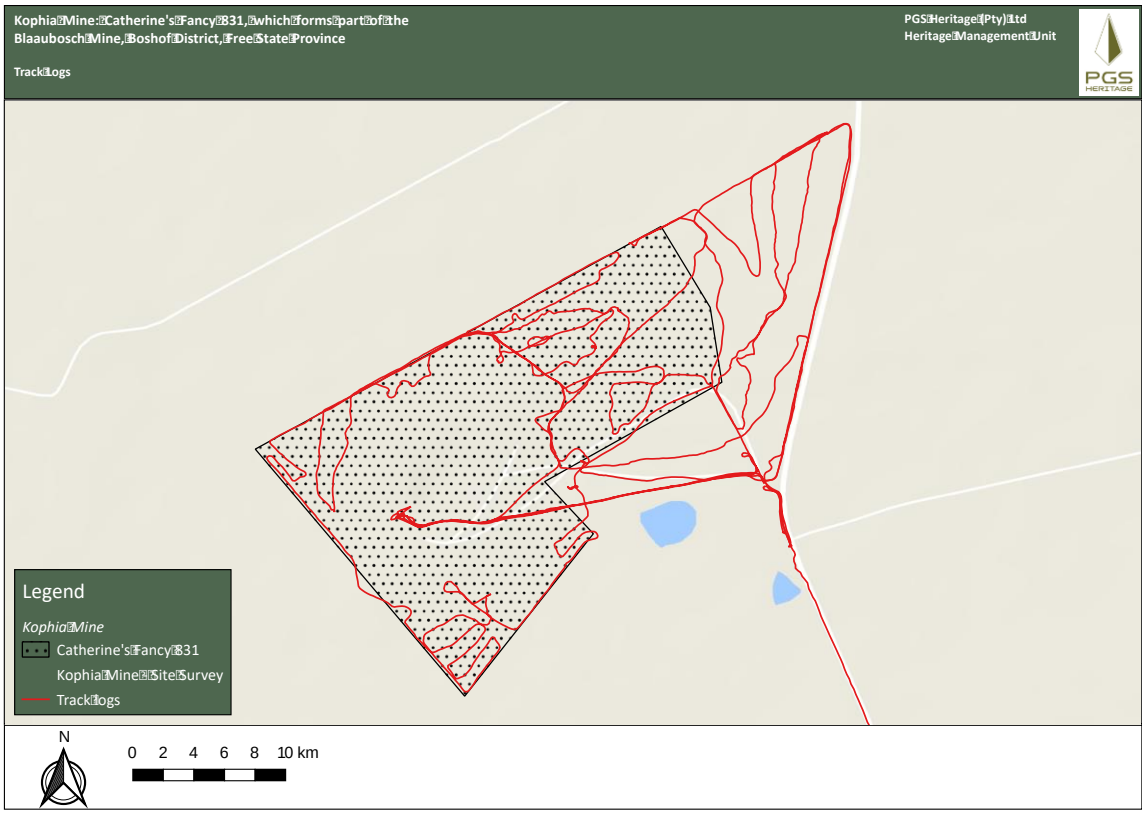

Figure 5 – Track log of Field Survey

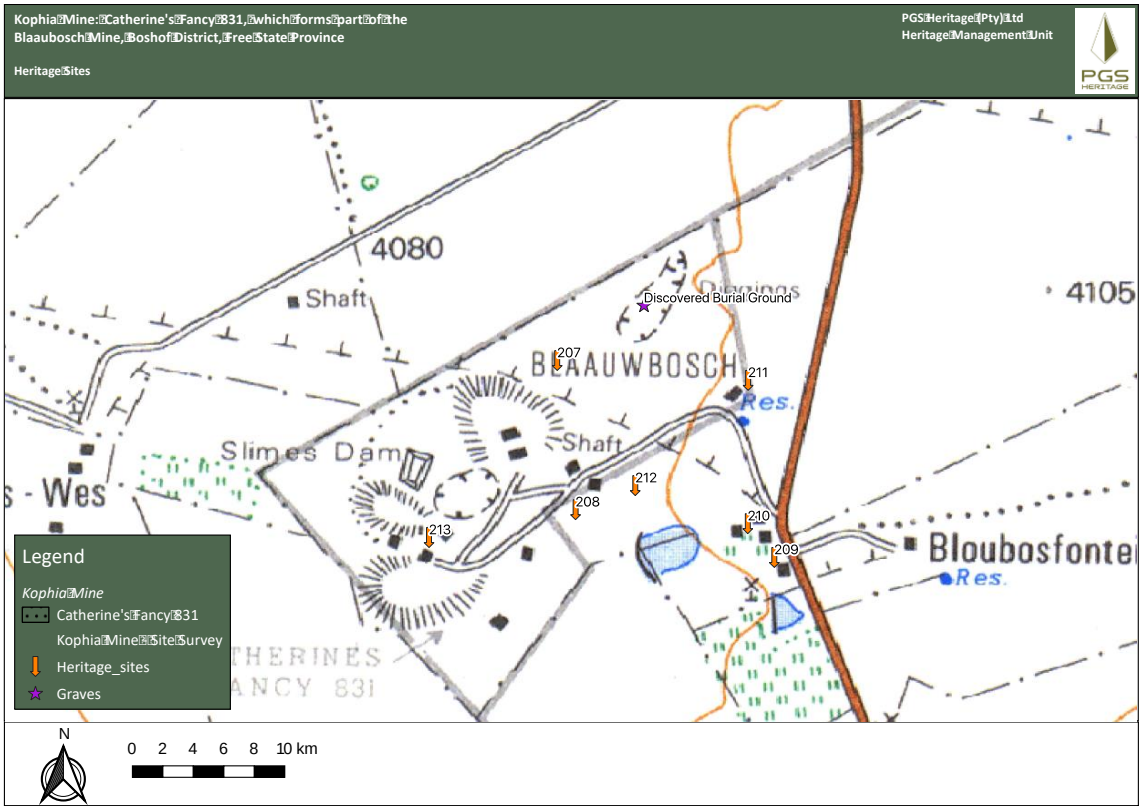

Figure 6 – Identified Heritage Features within the Mining Area

5.1 Site Descriptions

Refer to section **7.2.4** for the recommended management measures as proposed for inclusion in the EMPr.

5.1.1 Site 207

GPS: -28.553204º; 25.460024º

Site type: Find spot. Low density Stone Age surface scatter

Chronology: Middle Stone Age

Description: This area is located close to the area where the human remains were exposed. The area resembles a pan with some short thick tundra grass. A few MSA artefacts were located at this site.

Site size: 150 m in diameter

Site significance: GP.C

Recommendation: None. Can be destroyed but a destruction permit is required from SAHRA.

Figure 7 – Pan area at Site 207

Figure 8 – MSA stone tools

5.1.2 Site 208

GPS: -28.557371º; 25.60538º

Site type: Find spot. Low density Stone Age surface scatter

Chronology: Middle Stone Age

Description: This site is a pan with the same vegetation as the previous site. A sparse surface scatter of artefacts was exposed. Fifteen MSA artefacts were identified.

Site size: 6 x 6 m

Site significance: GP.C

Recommendation: None. Can be destroyed, but a destruction permit is required from SAHRA.

Figure 9 – View of pan at Site 208

Figure 10 – Some of the MSA stone tools

5.1.3 Site 209

GPS: -28.558706º; 25.466092º

Site type: Colonial

Chronology: Uncertain

Description: This site contains the foundation remains of an old store room. This site is not located within the study area.

Site size: 20 x 30 m

Site significance: None

Recommendation: None. Can be destroyed

Figure 11 – Foundations of old store room at Site 209

5.1.4 Site 210

GPS: 28.557761º; 25.465351º

Site type: Colonial

Chronology: Uncertain

Description: The site consists of various different structures: the white stone foundation of the old farm house (approximately 20m x 50m), three small dilapidated rooms of red-clay bricks and a rectangular foundation that could have been a porch. No ash midden could be identified. This site is located outside the study area.

Site size: 100 x 100 m

Site significance: None

Recommendation: None. Can be destroyed

Figure 12 – Site 210, the stone foundations of old farm house

Figure 13 – Smaller structures associated with old farm house

5.1.5 Site 211

GPS: -28.553758º; 25.465360º

Site type: Modern

Chronology: Uncertain, the structures do however appear on the first edition 1971 Topographic map of the area as residential structures. See section 4.2.

Description: This site contains the demolished foundations of approximately two small buildings located on the mining property. Some old corrugated iron was also found in the area, which could be from a modern structure dating to the 60's or 70's when the mine was not operational.

Site size: 50 x 50 m

Site significance: None

Recommendation: None. Can be destroyed

Figure 14 – Foundations of demolished buildings

Figure 15 – Remains of demolished buildings at Site 211

5.1.6 Site 212

GPS: -28.556699º; 25.462206º

Site type: Stone Age

Chronology: Middle Stone Age

Description: This is a pan with a medium density of MSA artefacts exposed on the surface. This site is located close to the mine entrance.

Site size: 50x 50m

Site significance: GP.C

Recommendation: None. Can be destroyed but a destruction permit is required from SAHRA.

Figure 16 – Some of the MSA stone artefacts

Figure 17 – MSA stone artefacts located at Site 212

5.1.7 Site 213

GPS: -28.558149º; 25.456442º

Site type: Historical

Chronology: Uncertain. Stakeholder engagement meetings are suggested to determine if the site could be dated from the 1950's.

Description: Old mine shaft with metal headgear.

Site size: 12 x 5 m

Site significance: GP.C

Recommendation: None.

Figure 18 - Old mine shaft at Site 213

5.1.8 Discovered Burial Ground

GPS: -28.551670°, 25.462450°

Site type: Burial Ground

Chronology: Uncertain. Initial stakeholder engagement during the survey suggests that it could be associated with the flu epidemic of 1914.

Description: The area contains exposed graves which were uncovered during mining operations. Prior to the appointment of PGS Heritage by Kophia Diamonds, an initial investigation was undertaken by Loudine Phillips from the National Museum at the request of SAHRA (Phillips, 2018).

During the stakeholder engagement process, the PGS team met with the great-grandchild of the original farm owner, Mr Kosie Botha. Mr Botha told as the story as it was passed on orally to him. *The farm was named after his great grandmother, Catherine, who had a dream about discovering diamonds on the farm. The farm was mined since before Mr Botha was born in 1930. He remembered that his grandfather also mined on the farm until after the flu epidemic in 1914. After the epidemic, a large crack was noticed in the mine one morning, which caused the managers to evacuate the mine. That night the mine collapsed, however, there were no casualties. Mining operations then stopped until sometime in the 1950's when Coronation Freehold decided to put in a shaft. The first collapse had resulted in a pan filled with water being created on the surface and the plan was to mine underneath the mud and water to get the diamonds from the fissure. However, the pressure from the surface was too immense and the struts erected underneath could not hold it resulting in a second collapse (again with no casualties). The mine was then left until recently when the Blaauwbosch (Kophia) mine was opened (the current mine operator).*

Mr Botha noted that the story of the graves was told to him by elders. who indicated that the graves had belonged to old farm workers and their families who had died of the flu epidemic in 1914 (the graves were already there when Mr Botha was born in the 1930s). Mr Botha's information is that a mass grave was dug; which would explain why the exposed remains don't seem to be in rows or have any semblance of formation. It is possible that the adults were buried at one end and the children at the other end. Apparently, the people who died of the flu epidemic were buried in the furthest corner of the farm (which is exactly where the exposed graves are located, at the corner of the farm Catherine's Fancy).

Site size: Uncertain

Site significance: GP.A

Recommendation: Grave exhumation and relocation, as is presently in process, subject to obtaining the required permits from the relevant authorities.

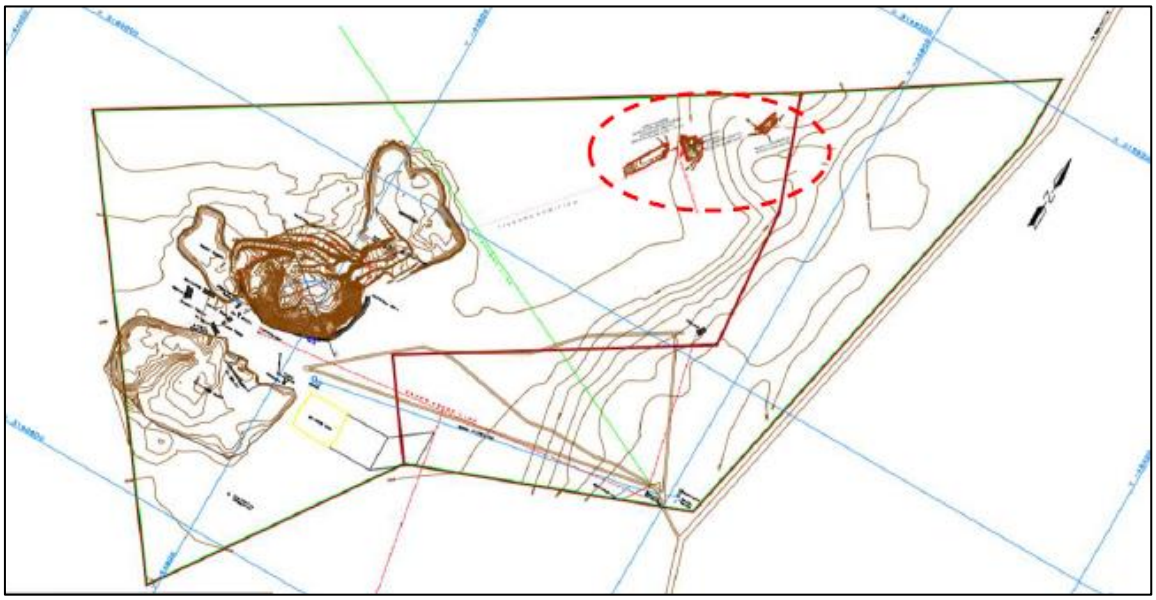

Figure 19: Location of area with the exposed burials on the Blaauwbosch Diamond Mine property (adapted from Phillips, 2018)

Figure 20 – Evidence of coffin material still in-situ (arrow)

Figure 21 – General area of disturbed graves

6 IMPACT ASSESSMENT

The fieldwork findings have shown that the study area is characterised by a background scatter of Stone Age artefacts. The methodology utilised in the identification and classification of finds between find spots and sites enables a clear distinction between groupings.

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

During the field assessment seven heritage resources were located, not including the accidentally discovered burial ground. These include three Middle Stone Age sites (**207, 208** and **212**) and four historical structures (**209, 210, 211** and **213).**

These sites have LOW heritage significance and no further mitigation measures are required, **except that a permit from SAHRA is required if the mining activity is expected to destroy the three MSA sites.**

The burial ground is currently undergoing a full grave relocation process, for which a permit application is in progress, as required by various authorities. This HIA report. forms part of the permit application.

It must be considered that the heritage significance of the identified sites plays a role in the evaluation of the impact and must influence the magnitude rating of the impact tables. Thus, a heritage resource with a high heritage significance rating will have a higher impact magnitude rating than a resource with a low or no heritage significance rating. Consequently, mitigation measures will be more extensive for a heritage resource with a high heritage significance than for those with a low heritage significance.

6.1 Status Quo and "No Go" option

6.1.1 Status Quo

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

6.1.2 "No go" Option

As the property is currently an operational mine, no such option is contemplated.

6.2 Project Impact

6.2.1 Heritage resources and sensitivity

The identified heritage resources are allocated a sensitivity buffer based on the recognised management buffers accepted by SAHRA in the past few years. No regulations in the NHRA provide guidelines on buffer zones. In the case of heritage sensitivity, a buffer of 20 – 50 meters is proposed based on the type of heritage resource. In the case of burial grounds and graves (BGG) a buffer of 50 meters is generally proposed and 20 meters for a heritage structure such as ruins and other built structures.

However, Section 17.6(a) of the Mine Health and Safety Act requires the employer to ensure that no mining operations are carried out under or within a horizontal distance of 100m from buildings, roads, railways, reserves, boundaries, any structure whatsoever or any surface, which it may be

necessary to protect; unless a shorter distance has been determined safe by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with. Reduction of this distance can only be approved by the DMR

6.2.2 Impact on burial grounds

One burial ground was identified accidentally before the commencement of the fieldwork. Due to the social and cultural significance of burial grounds and graves, a high heritage significance is given to such sites.

The impact of the proposed project on the burial ground is rated as having a HIGH significance before mitigation and with the implementation of mitigation measures as having a LOW significance.

In the event of any additional graves or burial grounds being uncovered, SAHRA should be contacted and a qualified archaeologist should be appointed to evaluate the finds and make appropriate recommendations on mitigation.

Table 9 – Assessment of impact of mining on burial grounds

Impact Name	**Impact of Burial Grounds**				
Alternative	**0**				
Phase	**Construction**				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	5	2
Extent of Impact	2	1	Reversibility of Impact	5	5
Duration of Impact	4	4	Probability	5	2
Environmental Risk (Pre-mitigation)					-20.00
Mitigation Measures					
A grave relocation process is currently in place.					
Environmental Risk (Post-mitigation)					-6.00
Degree of confidence in impact prediction:					High
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					2
Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.					
Degree of potential irreplaceable loss of resources					3
The impact may result in the irreplaceable loss of resources of high value (services and/or functions).					
Prioritisation Factor					1.50
Final Significance					-9.00

6.2.3 Impact on historical structures

The impact of the mining project on the historic heritage resources is rated as LOW significance. No mitigation measures are required.

Table 10 - Assessment of impact of mining on historical structures

Impact Name	**Impact of Historical Structures**				
Alternative	**0**				
Phase	**Construction**				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	1	2
Extent of Impact	2	1	Reversibility of Impact	5	5
Duration of Impact	4	4	Probability	3	2
Environmental Risk (Pre-mitigation)					-9.00
Mitigation Measures					
No mitigation measures are required					
Environmental Risk (Post-mitigation)					-5.50
Degree of confidence in impact prediction:					High
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					1
Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.					
Degree of potential irreplaceable loss of resources					1
The impact may result in the irreplaceable loss of resources of high value (services and/or functions).					
Prioritisation Factor					1.00
Final Significance					-5.50

6.2.4 Impact on Archaeological features

The impact of the proposed project on the archaeological resources is rated as LOW with no mitigation measures required, **except that a permit from SAHRA is required if the mining activity is expected to destroy the three MSA sites.**

In the event of any heritage resources being uncovered, SAHRA should be contacted and a qualified archaeologist should be appointed to evaluate the finds and make appropriate recommendation on mitigation.

Table 11 - Assessment of impact of mining on archaeological features

Impact Name	**Impact of Archaeological Features**				
Alternative	**0**				
Phase	**Construction**				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	2	2
Extent of Impact	2	1	Reversibility of Impact	5	5
Duration of Impact	4	4	Probability	3	2
Environmental Risk (Pre-mitigation)					-9.75
Mitigation Measures					
No mitigation measures are required					
Environmental Risk (Post-mitigation)					-9.00
Degree of confidence in impact prediction:					High
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					1
Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.					
Degree of potential irreplaceable loss of resources					1
The impact may result in the irreplaceable loss of resources of high value (services and/or functions).					
Prioritisation Factor					1.00
Final Significance					-9.00

7 MANAGEMENT RECOMMENDATIONS AND GUIDELINES

7.1 Operation phase

The project encompasses a range of mining activities, including ground clearance, and small-scale infrastructure development associated with the project. A buffer zone of 100m should be implemented around the area where the human remains were exposed until the relocation of the remains has been undertaken.

7.2 Chance find procedure

7.2.1 Archaeology

- 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 operation, the area should be demarcated, and all 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.
- Activities can commence as soon as the site has been cleared and signed off by the archaeologist.

7.2.2 Graves

In the case where a grave is identified during mining activities, the following measures must be taken:

- Upon the accidental discovery of graves, a buffer of at least 50 meters should be implemented. However, since the property is an operating mine, and as noted above (Section 6.2.1), the Mine Health and Safety Act requires a buffer of 100m to be implemented.
- If graves are accidentally discovered during operation, activities must cease in the area and a qualified archaeologist be contacted to evaluate the find. To remove the remains a permit must be applied for from SAHRA (Section 36 of the NHRA) and other relevant authorities (National Health Act and its regulations). The local South African Police Services must immediately be notified of the find.
- Where it is recommended that the graves be relocated, a full grave relocation process, which includes comprehensive social consultation, must be followed.

The grave relocation process must include:

i. A detailed social consultation process, that will trace the next-of-kin and obtain their consent for the relocation of the graves, that will be at least 60 days in length;
ii. Site notices indicating the intent of the relocation;
iii. Newspaper notices indicating the intent of the relocation;
iv. A permit from the local authority;
v. A permit from the Provincial Department of Health;
vi. A permit from the South African Heritage Resources Agency, if the graves are older than 60 years or unidentified and thus presumed older than 60 years;
vii. An exhumation process that keeps the dignity of the remains intact;
viii. The whole process must be done by a reputable company that is well versed in relocations;
ix. The exhumation process must be conducted in such a manner as to safeguard the legal rights of the families as well as that of the landowner.

7.2.3 Timeframes

It must be kept in mind that mitigation and monitoring of heritage resources discovered during mining activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the time frames. **Table 12** gives guidelines for lead times on permitting.

Table 12 - 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 – Graves/Human Remains	Service provider – Archaeologist and SAHRA	2 weeks
Relocation of burial ground or graves in the way of construction	Service provider – Archaeologist, SAHRA, local government and provincial government	6 months

7.2.4 Heritage Management Plan for EMPr Implementation

No.	Mitigation Measures	Phase	Timeframe	Responsible Party for Implementation	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
A	Implement chance find procedures in case where possible heritage finds area made	Operation	During operation	Applicant ECO Heritage Specialist	ECO (weekly)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Monthly Checklist/Report
Burial Grounds	Stakeholder engagement will need to be implemented and a grave relocation procedure. **This is currently in process**	Operation	6 months	Applicant ECO Heritage Specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
Historical structures	The sites are of LOW significance. **No mitigation measures are required**	Operation	During operation	Applicant ECO	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34 and 38 of NHRA	ECO Monthly Checklist/Report
Archaeology	The sites located are of LOW significance. **No mitigation measures are required.** In the event that any other heritage resources are uncovered SAHRA should be contacted and a qualified archaeologist appointed to evaluate the finds and make appropriate recommendation on mitigation	Operation	3 months	Applicant ECO Archaeologist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	ECO Monthly Checklist/Report

8 CONCLUSIONS AND RECOMMENDATIONS

Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant. This report focuses expressly on the area affected by current mining activities, other management measures as listed and required in other HIA's conducted in the area must still be implemented for other heritage features identified in the larger mining area.

The HIA has shown that the Kophia Diamond Mine has heritage resources present on the affected properties. This has been confirmed through a field survey, archival research and evaluation of aerial photography of the sites.

During the field assessment seven heritage resources were located, not including the accidentally discovered burial ground. These include three Middle Stone Age sites (**207, 208** and **212**) and four historical structures (**209, 210, 211** and **213).**

These sites have LOW heritage significance and no further mitigation measures are required**, except that a permit from SAHRA is required if the mining activity is expected to destroy the three MSA sites.**

The burial ground is currently undergoing a full grave relocation process, for which a permit application is in progress, as required by various authorities. This HIA report. forms part of the permit application.

It is my considered opinion that overall impact on heritage resources after the implementation of the recommended mitigation measures is acceptably low and that the project can be approved from a heritage perspective.

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