A PHASE 1 ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED COAL MINING RIGHT APPLICATIONON FOR PORTION 10 OF THE FARM GRASPAN 222 IS LOCATED IN THE MAGISTERIAL DISTRICT OF ERMELO, MPUMALANGA.

HIA For

Singo Consulting (Pty) Ltd

INTEGRATED SPECIALIST SERVICES (PTY) LTD

July 6, 2019

Authored by: Trust Mlilo and Joshua Kumbani (Professional Archaeologists and Heritage Management Specialists; ASAPA members)

DOCUMENT SYNOPSIS (EXECUTIVE SUMMARY)

Item	Description
Proposed development and location	A Phase 1 Archaeological/Heritage Impact Assessment for the proposed coal mining on the Farm Graspan 222 IS Portion 10 in the Magisterial District of Ermelo in Mpumalanga Province.
Purpose of the study	Phase 1 Archaeological Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed mining development on these resources within the area demarcated for the mining development.
1:50 000 Topographic Map	2629BC
Coordinates	See Table 1
Municipalities	Msukaligwa Local Municipality and Gert Sibande District Municipality
Predominant land use of surrounding area	Agriculture, game farming, cattle ranching, industrial, residential, powerlines, road, and transport
Applicant	Incredible Berachot Mining and Trading (Pty) Ltd Portion 237 R555, Old Middelburg Road, Kromdraai eMalahleni, Mpumalanga, 1038 071 125 8994 – Allen 072 612 9726 – Masiwa
EAP	Singo Consulting (Pty) Ltd Office No. 16, First Floor (South Block) Corridor Hill Crossing, 09 Langa Crescent, Corridor Hill, eMalahleni,1035 Tel: 013 692 0041 Email: kenneth@singoconsulting.co.za
Project Reference no.	MP30/5/1/2/2/10190MR
Size of application area	346, 4648 (ha) hectares
Heritage Consultant	Integrated Specialist Services (Pty) Ltd 65 Naaldehout Avenue, Heuweloord, Centurion, 0157 Email: trust@issolutions.co.za, Tel: +27 11 037 1565, Cell: +27 71 685 9247
Final Report	06 /07/ 2019

This document serves to inform and guide the applicant (Incredible Berachot Mining and Trading (Pty) Ltd) and contractors about the possible impacts that the proposed mining development may have on heritage resources (if any) located in the study area. In the same light, the document must also inform South African heritage authorities about the presence, absence and significance of heritage resources located in the study area. As required by South African heritage and mining legislation, Mining Right Applications such as this require pre-development assessment by a competent heritage practitioner in order to identify record and if necessary, salvage the irreplaceable heritage resources that may be impacted upon by the proposed mining development. In compliance with these laws Singo Consulting (Pty) Ltd retained Integrated Specialist Services (Pty) Ltd to conduct a Phase 1 Archaeological and Heritage Impact Assessment (AIA/HIA) of the proposed mining right application on the Farm Graspan 222 IS Portion 10 in the Magisterial District of Bethal/Ermelo/Middleburg in Mpumalanga Province. Desktop studies, drive-throughs and fieldwalking were conducted in order to identity heritage landmarks within and around the proposed mining right application area. It is interesting to note that the study area is not on entirely pristine landscape, having seen significant transformations owing to agriculture and farming infrastructure development. Although the area is known for historical and LIA occurrences, no archaeological resources were identifiable on the surface, even though this may be due to the tall grass that inhibits ground surface visibility. In terms of the built environment of the area, farm houses and structures at the farmstead appear to be older than 60 years although they are still in use. In terms of the archaeology of the area under study, no mitigation will be required prior to mining. However, in terms of Section 36 of the NHRA, three informal burial sites were recorded within the mining right application site. Although the applicant did not provide the layout plan for the mining development, at the time of survey mitigation measures for the burial sites are required to ensure that the mining development does not affect the graves. In addition, sub-surface archaeological material and unmarked graves may still exist and when encountered during clearance and construction of mining infrastructure, work must be stopped forth-with and the finds must be reported to the South African Heritage Resource Agency (SAHRA) or the heritage practitioner (see appended Chance Finds Procedure). This report must also be submitted to the SAHRA or PHRA for review.

NATIONAL LEGISLATION AND REGULATIONS GOVERNING THIS REPORT

This is a specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014.

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence.

Trust Mlilo and Joshua Kumbani, we do hereby declare that we are financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially our own, notwithstanding the fact that we have received fair remuneration from the client for preparation of this report.

Expertise:

Trust Mlilo, MA. (Archaeology), BA Hons, PDGE, BA & (Univ. of Pretoria) and PhD (Cand. Wits), ASAPA (Professional member) with more than 15 years of experience in archaeological and heritage impact assessment and management. Mlilo is an accredited member of the Association for Southern African Professional Archaeologists (ASAPA), Amafa akwaZulu Natali and Eastern Cape Heritage Resources Agency (ECPHRA). He has conducted more than hundred AIA/HIA Studies, heritage mitigation work and heritage development projects over the past 15 years of service. The completed projects vary from Phase 1 and Phase 2 as well as heritage management work for government, parastatals (Eskom) and several private companies such as BHP Billiton, Rhino Minerals.

Joshua Kumbani, PhD student (Wits University), MA Archaeology (University of Zimbabwe), BA Honours Archaeology (University of Zimbabwe), Certificate in Entreprenuership (University of Zimbabwe), Certificate in Leadership Development (University of Zimbabwe). Professional member of Association for Southern African Professional Archaeologists (ASAPA).

Independence

The views expressed in this document are the objective, independent views of Mr Trust Mlilo and Mr Joshua Kumbani. The survey was carried out under Singo Consulting (Pty) Ltd. Integrated Specialist Services (Pty) Ltd has no any business, personal, financial or other interest in the proposed Mining Right application apart from fair remuneration for the work performed.

Conditions relating to this report

The content of this report is based on the authors best scientific and professional knowledge as well as available information. Integrated Specialist Services (Pty) Ltd reserves the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the authors and Singo Consulting (Pty) Ltd. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

Authorship: This AIA/HIA Report has been prepared by Mr Trust Mlilo and Mr Joshua Kumbani (Professional Archaeologists). The report is for the review of the Heritage Resources Agency (PHRA).

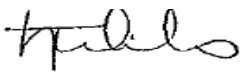
Geographic Co-ordinate Information: Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Maps included in this report use data extracted from the NTS Map and Google Earth Pro.

Disclaimer: The Authors are not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the SAHRA Regulations and Guidelines as to the authorisation of Mining Right Application being proposed by Incredible Berachot Mining and Trading (Pty) Ltd

Signed by



06/ 07/ 2019

Acknowledgements

The authors acknowledge Singo Consulting for their assistance with project information and Incredible Berachot Mining and Trading (Pty) Ltd for facilitating access to the site as well as responding to technical queries related to the project.

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1. ABBRIVIATIONS

AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
BID	Background Information Document
EIA	Environmental Impact Assessment
EIA	Early Iron Age *(EIA refers to both Environmental Impact Assessment and the Early Iron Age but in both cases the acronym is internationally accepted. This means that it must be read and interpreted within the context in which it is used.)*
EIAR	Environmental Impact Assessment Report
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
ICOMOS	International Council of Monuments and Sites
ISS	Integrated Specialist Services (Pty) Ltd
LIA	Late Iron Age
LFC	Late Farming Community
LSA	Late Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act 107 of 1998
NHRA	National Heritage Resources Act 25 of 1999
PHRA	Provincial Heritage Resource Agency

SAHRA	South African Heritage Resources Agency
ToR	Terms of Reference

2. KEY CONCEPTS AND TERMS

10.1 Periodization

Periodization Archaeologists divide the different cultural epochs according to the dominant material finds for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying. These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

10.2 Definitions

Definitions Just like periodization, it is also critical to define key terms employed in this study. Most of these terms derive from South African heritage legislation and its ancillary laws, as well as international regulations and norms of best-practice. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, ecofacts and artefacts of importance associated with the history, architecture or archaeology of human development.

Cultural significance is determined by means of aesthetic, historic, scientific, social or spiritual values for past, present or future generations.

Value is related to concepts such as worth, merit, attraction or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artefacts or other remains that are not in-situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless if they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Archaeological site/materials are remains or traces of human activity that 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. According to the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), no archaeological artefact, assemblage, or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorisation from the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority.

Historic material are remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Chance finds means archaeological artefacts, features, structures or historical remains accidentally found during development.

A grave is a place of interment (variably referred to as burial) and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A site is a distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Heritage Impact Assessment (HIA) refers to the process of identifying, predicting, and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project

which requires authorisation of permission by law and which may significantly affect the cultural and natural heritage resources. Accordingly, an HIA must include recommendations for appropriate mitigation measures for minimising or circumventing negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Impact is the positive or negative effects on human well-being and / or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the prehistorical, historical or the relatively recent past.

Study area or '**project area'** refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area.

10.3 Assumptions and disclaimer

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during clearance and mining, such activities should be halted immediately, and a competent heritage practitioner, SAHRA or PHRA must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6). Recommendations contained in this document do not exempt the developer from complying with any national, provincial, and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. ISS assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

3. TERMS OF REFERENCE(ToR)

The authors were retained to conduct an AIA/HIA study for Mining Right Application Permit addressing the following issues:

- Archaeological and heritage potential of the proposed mining development site including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the PHRA/ SAHRA to make an informed decision in respect of authorisation of the proposed mining development.
- Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located in and around the proposed mining right application site;
- Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
- Describe the possible impacts of the proposed development on these cultural remains, according to a standard set of conventions;
- Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources;
- Review applicable legislative requirements;

4. INTRODUCTION

Integrated Specialist Services (Pty) Ltd was retained by Singo Consulting (Pty) Ltd. to conduct a Phase 1 AIA/ HIA of the proposed mining right application of coal on the Farm Graspan 222 IS Portion 10 in the Magisterial District of Ermelo in Mpumalanga. The proposed mining right application area is predominantly agriculture. However, as prescribed by SAHRA and stipulated by legislation, an HIA is a pre-requisite for mining right application. The overall purpose of this heritage report is to identify, assess any heritage resources that may be located in the study area and evaluate the positive and negative impacts of the proposed mining development on these resources in order to make recommendations for their appropriate management. To achieve this, we conducted background research of published literature, maps, and databases (SHARIS) which was then followed by ground-truthing by means of drive-through surveys and field walking. Desktop studies had shown that Iron Age and historical sites were a possibility in the study area but no such sites were recorded during ground-truthing. While heritage resources may have been located in the study area, subsequent developments such as agriculture and associated infrastructure as farm trails have either obliterated these materials or reduced them to isolated finds that can only be identifiable as chance finds during mining. If the recommendations of this report are adopted, there is no archaeological reason why mining right application cannot be approved, taking full cognizance of clear procedures to follow in the event of chance findings.

5. POJECT LOCATION

Graspan Coal mining right area comprises approximately 346, 4648 hectares and is located approximately at 13.5 km South of Hendrina, adjacent to the N11 and R38 public roads towards Bethal town. It is also situated approximately 58km south of Middelburg and about 12.50 km South-West of the town of Hendrina town under Msukaligwa Local Municipality and Gert Sibande District Municipality in the Mpumalanga Province of South Africa. (see Figure 1&2).

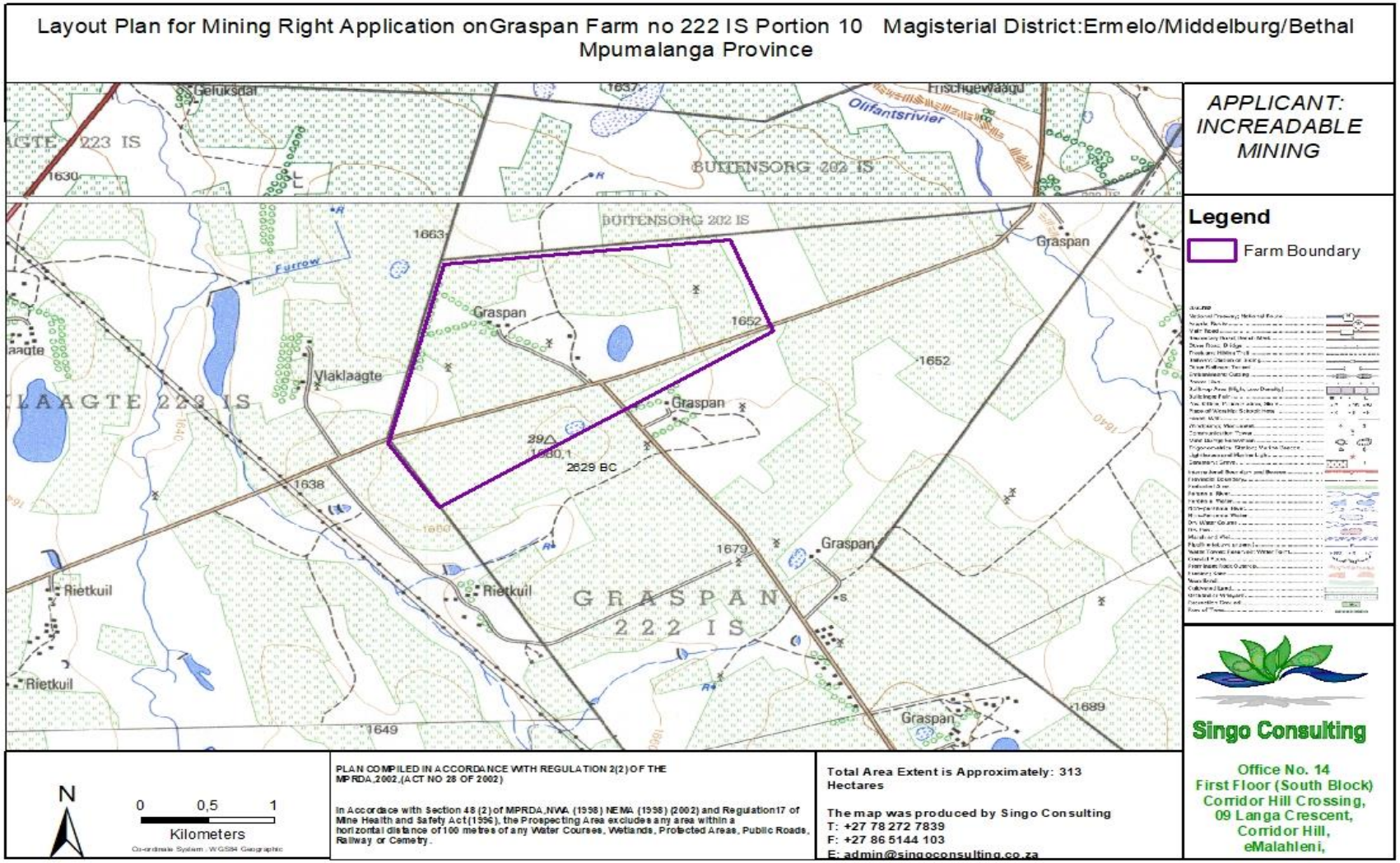

Figure 1: Location of the proposed project area (Singo Consulting 2019)

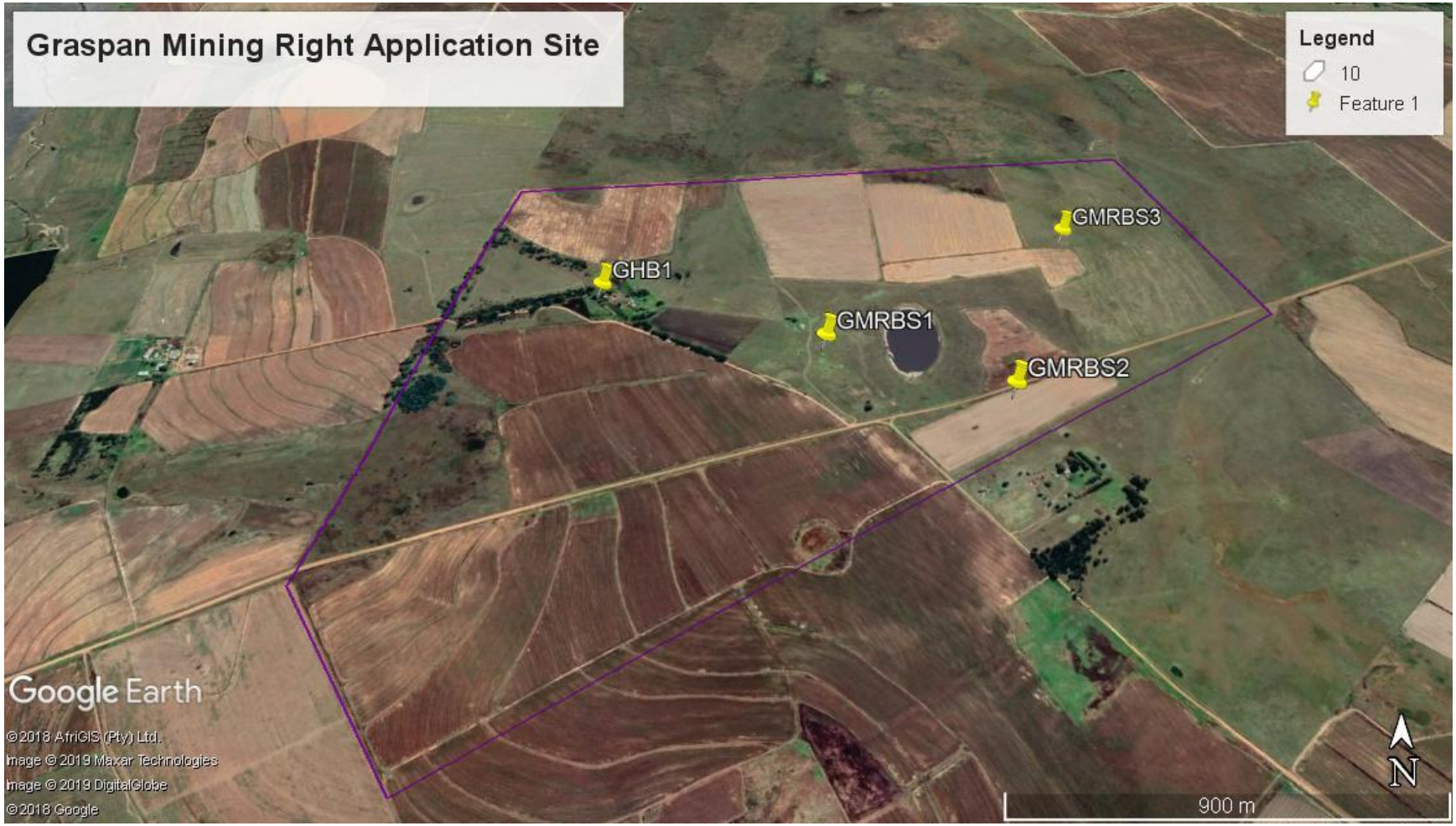

Figure 2: Location of burial sites and historical buildings located within the mining right application site (Mlilo 2019)

4.1 Project background and descriptions

Incredible Berachot Mining and Trading (Pty) Ltd has applied for a mining right in terms of the Minerals and Petroleum Resources Act (Act No.28 of 2002) (MPRDA) (as amended) over Portion 10 of the Farm Graspan 222 IS. DMR Ref: **MP30/5/1/2/2/10190MR**.

The Mining Right application is for Coal resources. The mining methods will be Open Cast Mining and Underground Mining. The mine is expected to run for 30 years. The proposed project relates to the opencast mining extracting the No. 2, 3, 4U and 4L coal seams of approximately 20 million tons per annum (Mtpa) of high-grade coal over a period of approximately thirty years. When coal seams are near the surface, it is economical to extract the coal using open cast (also referred to as open cut, open pit, or strip) mining method. Open cast coal mining recovers a greater proportion of the coal deposit than underground methods, as more of the coal seams in the strata may be exploited.

The seam compositing over the selected horizon was conducted in an early stage of the Graspan Coal Project in order to get the practical mining horizons which would have economic potential. The selection process took into consideration the minimum cumulative thickness (0.5 m), the maximum cumulative ash content (50% for the multiple seams). The sample thickness was used as a weight for calculation of the cumulative quality results and was concluded that Graspan is a mid-sized, advanced stage, coal exploration property that is endowed with 6.781 mineable tonnes in-situ [MTIS] (categorized under the Indicated and Measured Coal Resource) and 5.737 MTIS (categorized under the Inferred Coal Resources). This project is located in the Ermelo coalfield and is made up of one potentially economic seam, the C-Seam. The current estimated Coal Resources are amenable to a combination of both open cast and underground extraction methods, but exhibit characteristics that predominantly point to an underground operation. The project is at a very advanced exploration stage although Coal Reserves are yet to be declared.

The underground will be accessed via a boxcut audit. It is proposed that the boxcut, plant and associated mine infrastructure be located on Portion 10 of the farm Graspan 222 IS.

❖ Access & Haul roads (with necessary security) including the upgrading of the access point to the gravel road;

❖ Contractor's Yard with septic/chemical ablution facilities;

❖Offices;

❖Weighbridge, workshop and stores (with septic/chemical ablution facilities);

❖Rail Siding;

❖Diesel facilities and a hardstand;

❖Power and Water;

❖Boxcut;

❖Stockpiles (topsoil, overburden, subsoil/softs, ROM);

❖Surface water management measures (storm water diversion berms and trenches, pollution control dams, tailings dam etc.);

❖Crushing, screening & wash facility; and

❖Disposal dump.

Coal will be transferred from the underground to surface by means of a conveyor belt. Whereby, it will be sent to the plant area for processing (crushing, screening and washing). Mine residue from the plant will be disposed of onto an integrated disposal dump. Product coal will be sized and stockpiled in designated areas for pre-qualification prior to being transported to the market. It is currently anticipated that the plant will run 24 hours a day and 7 days a week.

Service Requirements:

❖ Electricity for the operation will be sourced from Eskom (8MVA required).

❖ Process water can be sourced from the River and tributaries (e.g. Ngweti) around.

❖ It is envisaged that potable/ domestic water will be sourced from boreholes on site, other alternatives are also being considered.

❖ General waste can be collected for disposal at the Municipal dump.

Industrial waste will be collected for disposal at a suitably licensed facility.

❖ Sewage will be collected within conservancy tanks to be emptied by honey sucker for treatment at a suitably licensed facility. Alternatively, a small, package sewage plant will be installed on site

6. ARCHAEOLOGICAL AND HERITAGE LEGAL FRAMEWORK

Relevant pieces of legislations to the present study are presented here. Under the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA), Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), and the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and 2014 EIA Regulations, an AIA or HIA is required as a specialist sub-section of the EIA.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its PHRAs. There are different sections of the NHRA that are relevant to this study. The proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require a HIA to be conducted by an independent heritage management consultant:

- Construction of a road, wall, powerline, pipeline, canal or other linear form of development or barrier exceeding 300m in length
- Development or other activity that will change the character of a site -
  - Exceeding 5000 sq. m
  - Involving three or more existing erven or subdivisions
  - Involving three or more erven or divisions that have been consolidated within past five years
  - Rezoning of site exceeding 10 000 sq. m
  - The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- Any other development category, public open space, squares, parks, recreation grounds

Thus, any person undertaking any development in the above categories, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed mining development. Section 38 (2) (a) of the NHRA also requires the submission of a heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs).

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may alter, damage, destroy, relocate etc. any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. Section 35 (4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be discovered before or during mining. This means that any chance find must be reported to SAHRA or PHRA (the relevant PHRA), who will assist in investigating the extent and significance of the finds and inform about further actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections

before destruction. Section 36 (3) of the NHRA also stipulates that no person may, without a permit issued by the SAHRA, destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority. This section may apply in case of the discovery of chance burials, which is unlikely (see appended chance find procedure). The procedure for reporting chance finds also applies to the likely discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials which exist in the proposed project area.

In addition, the EIA Regulations of 2014 (as amended in 2017) promulgated in terms of NEMA (Act 107 of 1998) stated that environmental assessment reports will include cultural (heritage) issues. The new regulations in terms of Chapter 5 of the NEMA provide for an assessment of development impacts on the cultural (heritage) and social environment and for Specialist Studies in this regard. The end purpose of such a report is to alert the applicant (the applicant, the environmental consultant, SAHRA or PHRA and interested and affected parties about existing heritage resources that may be affected by the proposed Mining Right Application, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

Assessing the Significance of Heritage Resources

The appropriate management of cultural heritage resources is usually determined on the basis of their assessed significance as well as the likely impacts of any proposed developments. Cultural significance is defined in the Burra Charter as meaning aesthetic, historic, scientific, or social value for past, present, or future generations (Article 1.2). Social, religious, cultural, and public significance are currently identified as baseline elements of this assessment, and it is through the combination of these elements that the overall cultural heritage values of the site of interest, associated place or area are resolved.

Not all sites are equally significant and not all are worthy of equal consideration and management. The significance of a place is not fixed for all time, and what is considered of significance at the time of assessment may change as similar items are located, more research is undertaken and community values change. This does not lessen the value of the heritage approach, but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why, also changes over time (Pearson and Sullivan 1995:7). This assessment of the Indigenous cultural heritage significance of the Site of Interest as its environments of the study area will be based on the views expressed by the traditional authority and community representatives, consulted documentary review and physical integrity.

African indigenous cultural heritage significance is not limited to items, places or landscapes associated with pre-European contact. Indigenous cultural heritage significance is understood to encompass more than ancient archaeological sites and deposits, broad landscapes, and environments. It also refers to sacred places and story

sites, as well as historic sites, including mission sites, memorials, and contact sites. This can also refer to modern sites with particular resonance to the indigenous community. The site of interest considered in this project falls within this realm of broad significance.

Archaeological sites, as defined by the National Heritage Resources Act (Act 25 of 1999) as places in the landscape where people once lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and non-renewable. Many such sites are unfortunately lost on a daily basis through infrastructure developments such as powerlines, roads and other destructive economic activities such as mining and agriculture. This is true for the proposed project area whose main economic activities are agriculture, transport and mining. It should be noted that once archaeological sites are destroyed, they cannot be replaced as site integrity and authenticity is permanently lost. Archaeological heritage contributes to our understanding of the history of the region and of our country and continent at large. By preserving links with our past, we may be able to appreciate the role past generations have played in the history of our country and the continent at large.

Categories of Significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

Aesthetic Value:

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and also the aesthetic values commonly assessed in the analysis of landscapes and townscape.

Historical Value:

Historic value encompasses the history of aesthetics, science and society and therefore to a large extent underlies all of the attributes discussed here. Usually a place has historical value because of some kind of influence by an event, person, phase or activity.

Scientific Value:

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

Social Value:

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group. It is important for heritage specialist input in the EIA process to take into account the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources; i.e. formally protected and generally protected sites:

Formally Protected Sites

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the PHRA.
- Grade 3 or local heritage sites.

General Protection

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 70 years.
- Structures older than 60 years.

The certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally ranked into the following categories:

Significance Rating Action

No significance: sites that do not require mitigation.

Low significance: sites, which may require mitigation.

2a. Recording and documentation (Phase 1) of site; no further action required.

2b. Controlled sampling (shovel test pits, auguring), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction.

Medium significance: sites, which require mitigation.

3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b].

High significance: sites, where disturbance should be avoided.

4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism.

High significance: Graves and burial places

4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinternment [including 2a, 2b & 3].

Furthermore, the significance of archaeological sites was based on six 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),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

An important aspect in assessing the significance and protection status of a heritage resource is often whether or not the sustainable social and economic benefits of a proposed mining development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data /information, which would otherwise be lost.

Table 1: Evaluation of the proposed Mining Right Application as guided by the criteria in NHRA and NEMA.

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
	Construction of bridge or similar structure exceeding 50m in length	No
	Development exceeding 5000 sq. m	Yes
	Development involving three or more existing erven or subdivisions	No
	Development involving three or more erven or divisions that have been consolidated within past five years	No
	Rezoning of site exceeding 10 000 sq. m	Not available
	Any other development category, public open space, squares, parks, recreation grounds	No
NHRA Section 34	Impacts on buildings and structures older than 60 years	Subject to identification during Phase 1
NHRA Section 35	Impacts on archaeological and paleontological heritage resources	Subject to identification during Phase 1
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	Subject to identification during Phase 1
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	Yes
Section 39(3)(b) (iii) of the MPRDA	AIA/HIA is required as part of an EIA	Yes

Other relevant legislations

The Human Tissue Act

Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925 is relevant to relocation of graves affected by development. Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act 25 of 1999. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial Member of the Executive Committee (MEC) as well as the relevant Local Authorities.

7. METHODOLOGY

This document falls under the basic assessment phase of the HIA and therefore aims at providing an informed heritage-related opinion about the proposed mining right application. This is usually achieved through a combination of a review of any existing literature and a basic site inspection. As part of the desktop study, published literature and cartographic data, as well as archival data on heritage legislation, the history and archaeology of the area were studied. The desktop study was followed by field surveys. The field assessment was conducted according to generally accepted HIA practices and aimed at locating all possible heritage objects, sites and features of cultural significance on the proposed mining right application site. Initially a drive-through was undertaken around the proposed mining right application sites as a way of acquiring the archaeological impression of the general area. This was then followed by a walk down survey in the study area, with a hand held Global Positioning System (GPS) for recording the location/position of each possible site. Detailed photographic recording was also undertaken where relevant. The findings were then analysed in view of the proposed mining development in order to suggest further action. The result of this investigation is a report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed mining development.

7.1 Fieldwork

The field survey was undertaken on the 2nd of July 2019 by a team of two archaeologists and an assistant. The study team covered the entire mining right application site because it is cleared and there are farm tracks and access roads. The mining right application sites were surveyed through farm tracks, access roads, main roads and public roads which cut across the sites. The main focus of the survey involved a pedestrian survey which was conducted across the proposed mining development site. The pedestrian survey focussed on parts of the project area where it seemed as if disturbances may have occurred in the past, for example bald spots in the grass veld;

stands of grass which are taller that the surrounding grass veld; the presence of exotic trees; evidence for building rubble, and ecological indicators such as invader weeds.

The literature survey suggests that prior to the 20th century modern agriculture and associated infrastructure; the general project area would have been a rewarding region to locate heritage resources related to Stone Age and particularly Iron Age and historical sites (Bergh 1999: 4). However, the situation today is completely different. The study area now lies on a clearly modified landscape that has previously been cleared of vegetation but is now dominated by corn fields and a continuous sweep of tall grass and shrubs that limit ground visibility. Several farm infrastructure developments, ploughed fields and farm roads and other infrastructure developments dominate the project area.

7.2 Consultation

The EIA Public Participation process will be conducted by the EAP and specialists. The EIA Public Participation Process will invite and address comments from affected communities and any registered heritage bodies on any matter related to the proposed mining project including heritage concerns that may arise as a result of the project. The heritage team will request land owners to declare graves that may be located in their farms.

8. PHOTOGRAPHIC PRESENTATION OF THE PROJECT SITE

The following photographs illuminate the nature and character of the Project Area.

Plate 1: Photo **A**. showing road cutting through the site.

Plate 2: Photo **B**. showing a pan within the proposed mining right application site. Note that the survey team searched around the pan for easpecially stone age lithic remains but none were found.

Plate 3: Photo **C**. showing blue gum tree and traces of a delict farm dwelling.

Plate 4: Photo **D**. showing a historical farmstead within the proposed mining site.

Plate 5: Photo **E** showing some farm structures associated with historical building.

Plate 6: Photo **F**. showing recently harvested field.Note that the entire site is used for agriculture except for few patches near features such as the pan.

Plate 7: Photo **G** showing recently harvested fields.

Plate 8: Photo **H**, showing a derilic farm dwelling site.Note that the site is marked rubble which is not conservation worth.

Plate 9: Photo **I**, showing patches of grazing area which are not ploughed..

9. ARCHAEOLOGICAL AND HERITAGE CONTEXT OF THE STUDY AREA

Introduction

In order to place the project area in archaeological and historical context, primary and secondary sources were consulted. Ethnographical and linguistic studies by early researchers such as Theal and Van Warmelo provide insights on the cultural groups who lived in and around the project area since ca 1600. Historic and academic sources by Küsel and Bergh, Makhura, Delius, and Webb were also consulted. Limited contemporary research has been done on prehistoric African settlements in the study area, and according to Bergh, there are no recorded sites that date from the Stone Age, (including Rock paintings or engravings), Early or Later Iron Age. The topographical map of the area shows that the project area has been previously disturbed with cultivated land, and residential developments and associated infrastructure.

Stone Age Archaeology

Stone Age sites are marked by stone artefacts that are found scattered on the surface of the earth or as parts of deposits in caves and rock shelters. The Stone Age is divided into the Early Stone Age (covers the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (refers to the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (the period from 22 000 years ago to 200 years ago). The Later Stone Age is also associated with rock paintings and engravings which were done by the San, Khoi Khoi and in more recent times by Iron Age farmers. Heritage surveys up to now have recorded few outstanding Stone Age sites, rock paintings and engravings in the Eastern Highveld - primarily as a result of limited extensive archaeological surveys. Stone tools have been recorded around some of the pans which occur on the Eastern Highveld.

In the larger geographical area, there is material manifestation of Stone Age people but generally, Highveld area did not attract much of habitation in these early times due to lack of rock-shelters and domination of exposed environments. Thus, it is mostly in the vicinity of large watercourses and lower parts of mountains that some ESA (~ 2.6 million to 250 000 years ago) materials (crude chopper and other unifacial tools of the Oldowan industry and the characteristic Acheulian hand axes and cleavers) and MSA (~ 250 000 to 40-25 000 years ago) materials are generally found. The MSA is a flake-technological stage characterized by faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology. More technological and behavioural changes than those witnessed in the MSA, occurred during the LSA (~ 40-25 000, to recently, 100 years ago), which is also associated with Homo Sapiens (Barham and Mitchell 2008). For the first time we get evidence of people's activities derived from material other than stone tools (ostrich eggshell beads, ground bone arrowheads, small bored stones and wood fragments) (Deacon and Deacon 1999). The LSA people are also credited with the production of rock art (engravings and paintings), which is an expression of their complex social and spiritual beliefs (Parkington et al. 2008). However, it is important to note that no Stone Age materials were recorded during the field walking, perhaps

due to the presence of tall grass. Nonetheless, it is possible to encounter isolated finds of these objects in the study area, even though these would most likely be out of context due to the modern disturbances.

The characteristics of Stone Age sites in the Ermelo area is that they occur near pans or close to raw material sources that can make stone tools (Pistorius 2006). There are some known Late Stone Age sites in the area around the Ermerlo area. The sites are Welgelegen Skuiling close to Ermelo, Chrissiesmeer (also known for rock art) and lastly Groenvlei close to Carolina, this area is also known for rock art (Bergh 1999). The broader study area is also associated with rock paintings and engravings which were done by San hunter-gatherers, Khoi Khoi herders and EIA (Early Iron Age) farmers (Maggs 1983). It is estimated that about 400 rock art sites are distributed throughout Mpumalanga, notably in the northern and eastern regions at places. The Ermelo area holds eight rock paintings (Smith and Zubieta 2007). Engravings also occur for example, at Boomplaats.

Welgelegen Shelter Welgelegen Shelter is located about 20 km from Ermelo in a NNE direction on the banks of the Vaal River and is about 41m wide, 13m deep and 2m high. In 1967 M. Schoonraad and P. Beaumont carried out excavations at this site. Two yard squares located about 30 m upstream of the shelter under the overhang were excavated and classified into two strata: Stratum one ranged from a depth of 10 to 15 inches and proved to be sterile. Stratum two ranged from one to ten inches and revealed Later Stone Age as well as Iron Age material. Excavations in the shelter were also classified into two strata which revealed Later Stone Age material in stratum one and a combination of LSA and Iron Age material in stratum 2. Some of the artefacts excavated include: Concave and convex scrapers, irregular flakes, bone beads, cowry shell beads, bone implements, ostrich eggshell beads, potshards, iron awls, adzes and bangles, copper hairpins, glass beads etc (Schoonraad & Beaumont : 1971) In addition to these remains, the following rock art were found: three biochrome white and yellow images depicting what appears to be impala (published by Schoonraad 1965), a white image of a bird (published by Battis 1949), and faded dark red blotches (Schoonraad & Beaumont 1971).

Iron Age Archaeology

The Iron Age is associated with the agro-pastoralists who lived in semi-permanent villages and practiced metal working (Pistorius 2017). The Iron Age archaeology is generally divided into two phase which are Early Iron Age and Late Iron Age. The presence of pottery associated with LSA material points to the starting of farming communities. For example, the Welgelegen Shelter on the banks of the Vaal River near Ermelo has evidence of this coexistence (Pistorius 2017).

Iron Age of the Mpumalanga Province is dated to the 5th Century AD when the Early Iron Age (EIA) proto-Bantu-speaking farming communities began arriving in this region which was then occupied by hunter-gatherers. These EIA communities are archaeologically referred to as the Mzonjani facies of the Urewe EIA Tradition (Huffman, 2007: 127-9). They occupied the foothills and valley lands along the general Indian Ocean coastland introducing settled

life, domesticated livestock, crop production and the use of iron (also see Maggs 1984a; 1984b; Huffman 2007). Alongside the Urewe Tradition was the Kalundu Tradition whose EIA archaeological sites have been recorded along the Mpumalanga areas. From AD 650 to 750 the EIA sites in the region are classified as the Msuluzi facies which was replaced by the Ndondondwane and Ntsekane facies from AD 750 to 950 and AD 950 to 1050 respectively (Huffman, 2007).

By 1050 AD proto-Nguni Bantu-speaking groups associated with the Late Iron Age (LIA) called the Blackburn sub-branch of the Urewe Tradition had arrived in the eastern regions of South Africa, including modern day Mpumalanga, migrating from the central African region of the Lakes Tanganyika and Victoria (Huffman 2007: 154-5). According to archaeological data available, the Blackburn facies ranged from AD 1050 to 1500 (ibid. p.155). The Mpumalanga and the Natal inland regions saw the development of the LIA Moor Park facies between AD 1350 and 1750. These archaeological facies are interpreted as representing inland migration by LIA Nguni speaking groups (Huffman 2007). Moor Park is associated with settlements marked by stonewalling. The period from AD 1300 to 1750 saw multiple Nguni dispersal from the coastland into the hinterland and eventually across the Drakensberg Escapement into central and eastern South Africa (ibid).

Around 220 Late Iron Age stone walled sites are known from the Bethal area (Bergh 1999). These stone walls date to around 17th century and are known to have been built by the Sotho, Pedi, Ndebele and Swazi prior to the arrival of the arrival of the colonial settlers. It is considered that this style architecture may have been adopted by the first colonial farmers in the Eastern Highveld (Pistorius 2006). For example, one of the known Late Iron Age site is located at the top of Tafelkop that is located North West of Ermelo where more than 100 corbelled huts are found. The site is associated with the early Sotho and associated with the corbeled huts which mainly occur in the north-eastern Free State (Mason 1962; Maggs 1972).

Historical Background

Historical sites also occur in the study area. Historical sites include historical farming sites and historical mining sites. The farming related sites usually consists of farmsteads and farm cemeteries, either belonging to the landowners or their labourers (Pistorius 2006). Historical mining related sites that exist in the broader study area include old Albion Colliery north east of the study area, dating to the 1940's (van de Walt 2014).

The Late Iron Age Nguni communities engaged in the Indian Ocean Trade exporting ivory and importing consumables such as cloth and glass beads. The exporting point was Delagoa. This brought the Nguni speaking community in touch with the Indo-Asian and first Europeans (Portuguese). It was the arrival of the Dutch and the English traders that opened Delagoa Bay to more trade did the Nguni engaged in extensive trade with the international traders (Huffman 2007). From the late 1700s, trade in supply of meat to passing ship had increased substantially to an extent that by 1800 meat trade is estimated to have surpassed ivory trade. At the same time

population was booming following the increased food production that came with the introduction of maize that became the staple food. Naturally, there were signs that population groups had to compete for resources especially along the east coastal regions. The KwaZulu Natal coastal region has a special place in the history of the region and country at large. This relates to the most referenced Mfecane (wandering hordes) period of tremendous insecurity and military stress which eventually affected the entire Southern Africa including the modern-day Mpumalanga area. Around the 1830s, the region also witnessed the massive movements associated with the Mfecane. The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988). In this context new African kingdoms emerged such as the Zulu Kingdom under Shaka in the second quarter of the 1800s AD. Military pressure from Zululand spilled onto the highveld by at least 1821. Various marauding groups of displaced Sotho-Tswana moved across the plateau in the 1820s. Mzilikazi raided the plateau extensively between 1825 and 1837. During the Difaquane they fled to the south from the Ndebele of Mzilikazi who established several settlement complexes in Eastern Bankveld between Pretoria and Witbank (Bergh 1999: 10-11; 109).

Ethnographical and linguistic studies by early researchers such as Ziervogel, Theal and Van Warmelo shed light on the cultural groups living in the area since ca 1600. Historic and academic sources by Küsel and Bergh, were consulted, as well as historic sources by Makhura and Webb.

SAHRIS Database and Impact assessment reports in the proposed project area

Several archaeological and heritage studies were conducted within broader project area and their vicinity since 2002 and these presents the nature and heritage character of the area. In the Ermelo area there are also Heritage Impacts assessments that have been done in the Emerlo area. Van Wyk Rowe (2014) did impact assessment of the Portion 2 of farm, Langverwacht 293 in Ermelo**.** The results of this HIA recorded unmarked burials which the worker (Joseph Madonsela) at the farm alerted the archaeologist and hence consultations are important when doing fieldwork. However, there were no other archaeological sites that were recorded in the study. Roodt (2012) did impact assessment for the proposed Overvaal coal mining in farms Vlakfontein 266IT; Weltevreden 289IT, Mooiplaats 290IT, Adrianople 296IT, Buhrmansvallei 297IT in Ermelo. The study recorded some features that are associated with historic farming activities. Celliers (2013) did phase 1 impact assessment on portion 22 of the farm Witpunt 267IT in Ermelo. The survey yielded graves, farm worker dwellings and no archaeological material was recorded during the survey. G and Heritage Consultants (2011) did a study for the proposed extension of the Camden Ash Disposal facilities in Ermelo. The results of the study only recorded burials in the study area and there were no archaeological signatures that were found during the study. Another consultant Digby Wells Environmental (2013) did surveys in a number of farm portions for the proposed Kusipongo Resource Mining Project in Ermelo. The study recorded stone walls that were deemed of very low significance and also burials were identified. Jaco

van der Walt (2014) did a study at Highveld Haven filling station close to Ermelo and no archaeological sites were recorded in the study but there was a cemetery that was recorded.

Intangible Heritage

As defined in terms of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) intangible heritage includes oral traditions, knowledge and practices concerning nature, traditional craftsmanship and rituals and festive events, as well as the instruments, objects, artefacts and cultural spaces associated with group(s) of people. Thus, intangible heritage is better defined and understood by the particular group of people that uphold it. In the present study area, very little intangible heritage is anticipated on the development footprint because most historical knowledge does not suggest a relationship with the study area per se, even though several other places in the general area such do have intangible heritage.

10. RESULTS OF THE FIELD STUDY

The main cause of impacts to archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. It is important to note that the heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from their original position. The severe impacts are likely to occur during clearance, construction of access roads and other amenities for the mine as well as foundations of buildings, indirect impacts may occur during movement of mining equipment and vehicles. The excavation and clearance of top soil will result in the relocation or destruction of all existing surface heritage material. Similarly, the clearing of access roads will impact material that lies buried beneath the surface. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified, and their significance assessed prior to mining. It is important to note, that due to the localised nature of archaeological resources, that individual archaeological sites could be missed during the survey, although the probability of this is very low within the proposed Mining Right Application site. Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during mining. The purpose of the AIA is to assess the sensitivity of the mining right application area in terms of archaeology and to avoid or reduce the potential impacts of the proposed mining development by means of mitigation measures (see appended Chance Find Procedure). The study concludes that the impacts will be negligible since the site has previously been cleared for corn fields and associated infrastructure such as irrigation infrastructure and farm roads. The following section presents results of the field survey.

10.4 Archaeological Heritage Sites

The proposed mining right application area did not yield any confirmable archaeological sites or material. Some sections of the affected landscape are heavily degraded from previous and current land use such as agriculture and associated infrastructure. The proposed mining right site is located within a heavily disturbed landscape characterised by approximately 95% of the land being utilised for agricultural purposes and approximately 5% or less may being occupied with few patches of thick bushes of uncleared land, farm roads, power lines, farmsteads and farm workers' dwellings. This limited the chances of encountering significant in *situ* archaeological sites to be preserved in *situ*. As such the proposed mining development, will be an additional development on the project area (see Plates 1 to 9). It is the considered opinion of the authors that the chances of recovering significant archaeological materials were seriously compromised and limited due to destructive land use patterns such as deep ploughing, road works and farm infrastructure as well as dwellings that already exist on the project area.

Based on the field study results and field observations, the authors concluded that the receiving environment for the proposed mining development is low to medium potential to yield previously unidentified archaeological sites during subsurface excavations and construction work associated with the proposed mining development. In

addition, the proposed mining development will not alter the entire land applied for this mining right. It should be noted that the lack of confirmable archaeological sites should rather be seen as a lack of research in the area and not as an indication that such features do not occur. As such the chance find procedure apply (see appended chance find procedure)

10.5 Burial grounds and graves

Human remains and burials are commonly found close to archaeological sites; they may be found in abandoned and neglected burial sites, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Archaeological and historical burials are usually identified when they are exposed through erosion and earth moving activities or infrastructure developments such as powerlines and roads. In some instances, packed stones or stones may indicate the presence of informal pre-colonial burials.

The field survey recorded three informal burial sites within the proposed mining right application site. The burial sites were recorded as GMRBS 1, GMRBS2 and GMRBS3.

Burial site GMRBS1 was recorded near farm dwellings. The site is located at GPs coordinates S26° 15' 43.6".and S29° 39' 18.0" (see figure 1). The site is divided into two clusters suggesting that the graves belong to unrelated families. The first cluster has 9 graves belonging to the Mahamba family and the second cluster has graves belonging to Masemola, Skosana and Motau families. Most of the graves are marked by cement plaster and inscribed headstones. The second cluster has 8 graves and only one grave is marked by tombstones and inscribed headstone. Five graves are traditional graves marked by oval shaped stone piles and distinctive headstones. One grave is marked by cement plaster and headstone while the other one is marked by brick lining. The age of the graves could not be established because the affected families have since moved from the farm. However, farm workers confirmed that the families still live in the Hendrina farming area and can be traced.

Burial site GMRBS2 was recorded near the road to Hendrina. The site is located at GPs coordinates S26° 15' 49.8".and S29° 39' 36.0" (see figure 2). The site is fenced and well secured. Most graves are not very visible due to tall grass and years of neglect but the study team estimated that they could be more than 30 graves at this site. Information we obtained from one marked grave suggest that the burial site belongs to the Mphuti Family. The rest of the graves do not have name tags. As such the study team could not obtain important information about the site. Consultation with the nearby farms did not yield conclusive results. The burial site is known by the local community and they confirmed that the families still live around Hendrina farms.

Burial site GMRBS3 is located on the north western edge of the proposed mining right site (see figure 1). The site has been fenced but the fence has now collapsed. The burial site is located at GPS coordinates S26° 15' 27.3".and S29° 39' 45.6". The site is located near the windmill and reservoir. Most of the tombstones at the site have collapsed,

however the study team confirmed that most of the graves belong to the Myeni, Mguni and Sibiya families. Most of the graves are likely to be older than 60 years, one of the oldest burial was done in 1944. Twenty-five graves were recorded at this site. Seventeen are marked by oval shaped stone piles, 5 are marked by brick lining and 3 are marked by tombstones and inscribed headstones.

Burial grounds and gravesites are accorded the highest social significance threshold (see Appendix 3). They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tempered with or interfered with during any proposed development. It is important to note that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present (see appended Chance Find Procedure). Although the possibility of encountering previously unidentified burial sites is low at the mining right application area, should such sites be identified during subsurface mining, they are still protected by the NHRA and the Human Tissue Act.

J

Plate 10: Photo **J**, showing first cluster of graves at burial site GMRBS1.

K

Plate 11: Photo **K**, showing inscribed headstones with important family details..

Plate 12: Photo **L**, showing graves at burial site GMRBS1.

Plate 13: Photo **M**, showing grave marked by tombstones and inscribed headstones. Note that the headstones have collapsed.

Plate 14: Photo **N**, showing a partiallly disturbed grave at burial site GMNRBS1.

Plate 15: Photo **O**, showing burial site GMRBS2 which is fenced and secured.

Plate 16: Photo **P**, showing graves concealed by grass cover.Note that the study team could not determine the number of graves because of grass cover.

Plate 17: Photo **Q**, showing some grave goods concelead by grass.

R

Plate 18: Photo **R**, showing one of the few partially vissible graves at burial site GMRBS2

S

Plate 19: Photo **S**, showing graves at burial site GMRBS3.Note that all the tombstones have collapsed.

T

Plate 20: Photo **T**, showing collapsed headstone with vital information about the deceased and family.

U

Plate 21: Photo **U**, showing graves with collapsed tombstones.

V

Plate 22: Photo **V**, showing graves marked by brick lining at burial site GMRBS3.

W

Plate 23: Photo **W**, showing closer view of graves marked by brick line.Note the site shows signs of neglect.

Plate 24: Photo **X**, showing windmill and resevoir located near the burial site GMRBS3.

Plate 25: Photo **Y**, showing unique inscriptions on one of the graves at burial site GMRBS3.

10.6 Buildings and Structures older than 60 years

There is one farmstead and associated farm structures which are jointly referred to GHB1 were confirmed to be older than 60 years. The site is located at GPs coordinates S26° 15' 36.9".and S29° 38' 55.8". Although the buildings have been renovated and altered over years of occupation they still retain their historical fabric and therefore still protected by Section 34 of the NHRA. The buildings are of heritage significance and must not be destroyed without a demolition permit from the PHRA. No mitigation is required for the farmstead since it is occupied and likely to be used as offices or parking bay for mine trucks and equipment

10.7 Public Monuments and Plaques

The study did not identify any public monuments and commemorative plaques within the proposed mining right application site. Therefore, the site does not trigger Section 37 of the NHRA.

10.8 Natural and Geological Heritage

The survey did not record any cave or sacred geological formation in the proposed mining right application area. Residents including landowners who were consulted are not aware of any significant caves or sacred geological formations in the mining right application area.

10.9 Assessment of mining impacts

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to the project site under study for meeting a project need. The significance of the impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the impacts will be determined through a synthesis of the criteria below:

Probability: This describes the likelihood of the impact actually occurring

Improbable: The possibility of the impact occurring is very low, due to the circumstances, design or experience.

Probable: There is a probability that the impact will occur to the extent that provision must be made therefore.

Highly Probable: It is most likely that the impact will occur at some stage of the development.

Definite: The impact will take place regardless of any prevention plans and there can only be relied on mitigatory measures or contingency plans to contain the effect.

Duration: The lifetime of the impact

Short Term: The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.

Medium Term: The impact will last up to the end of the phases, where after it will be negated.

Long Term: The impact will last for the entire operational phase of the proposed development but will be mitigated by direct human action or by natural processes thereafter.

Permanent: The impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: The physical and spatial size of the impact

Local: The impacted area extends only as far as the activity, e.g. footprint

Site: The impact could affect the whole, or a measurable portion of the above-mentioned properties.

Regional: The impact could affect the area including the neighboring residential areas.

Magnitude/ Severity: Does the impact destroy the environment, or alter its function

Low: The impact alters the affected environment in such a way that natural processes are not affected.

Medium: The affected environment is altered, but functions and processes continue in a modified way.

High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance: This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

Table 2: **The following weights were assigned to each attribute:**

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	≤20
	Low	>20 ≤40
	Moderate	>40 ≤60
	High	>60

The significance of each activity should be rated without mitigation measures (WOM) and with mitigation (WM) measures for both construction, operational and closure phases of the proposed mining development.

Table 3: **Impact Assessment Matrix**

Graspan Mining Right Application								
Nature of Impact	**Management Measures**	**Duration**	**Scale**	**Magnitude/ Severity**	**Probability**	**Calculations Sum (Duration, Scale, Magnitude) x Probability**	**Proposed Mitigation Measures**	**Significance**
Archaeological Remains	Without management	3	3	6	2	(3+3+6) x 2=**24**	No archaeological remains were recorded within the proposed project site, no measures are required.	Low to medium
	With management	3	2	2	2	(3+2+2) x 2=**14**	No archaeological remains were recorded within the development site. However, the chance find procedure applies.	Low to medium
Graves and Burial Grounds	Without management	5	2	8	5	(5+2+8) x 5=**75**	The 3 burial sites recorded can be preserved in situ or if it is necessary the affected graves can be relocated in accordance with the NHRA/Human Tissue Act depending on their age and status..	High
	With management	3	2	6	5	(3+2+6) x 5=**55**	Depending on the mining layout plan, the burial sites may be avoided and secured by fencing off.	Moderate
Historical buildings and structures	Without management	4	2	8	5	(4+2+8) x 5=**70**	There are buildings and structures which are yet to be confirmed if they are going to used or demolished.	High
	With management	3	3	6	4	(3+3+6) x 4=24	Mitigation may not be required if the buildings are not going to be destroyed..	Low
Mining Heritage	Without management	3	3	1	4	(3+3+1) x 4=28	No traces of historical mining in the project area. Mitigation not required	Negligible
	With management	3	2	1	2	(3+2+1) x 2=12	No traces of historical mining in the site. Mitigation not required	Negligible

Public Monuments and memorials	Without management	3	3	1	1	(3+3+1) x 1=7	None recorded within the site. Mitigation not required	Negligible
	With management	1	3	1	1	(1+3+1) x 1=5	Induct construction workers and mark any memorials and plaques	Negligible
Natural Heritage	Without management	3	3	6	2	(3+3+6) x 2=36	None recorded within the site. Mitigation not required	Low
	Without management	3	2	2	2	(3+2+2) x 2=14	Mitigation not required	Negligible

Based on the impact rating, the main impact will be on burial sites whose fate is not known the mining layout plan was not available at the time of this study. Concern is also heritage resources buried beneath the surface which may be exposed during mining. Although the potential of encountering significant heritage resources during mining, these are covered by the appended Chance Find Procedure.

10.10 Mitigation Measures

From an archaeological perspective mitigation is not required for the proposed mining right application site. However, the appended Chance Find Procedure applies, any accidental finds must be dealt with in accordance with the chance find procedure. In terms of Section 36 of the NHRA that protects graves, mitigation is required. The recorded burial sites must be clearly marked and protected before any mining activities take place. From a heritage perspective no mining activities must be conducted within the 25m buffer zone of each burial site. However, it must be noted that since it is a mining project, the MPRDA regulations take precedence, as such no blasting must be done within the 500m buffer zone from any heritage resources. The custodians of the affected burial sites must be tracked and involved in the mitigation measures to protect their graves. In addition, the planners must ensure that they provide access to each burial site to allow families to interact with their burial sites. Should it be necessary to relocate the graves, a professional archaeologist must be appointed to deal with the consultations, application for burial permits and the actual relocation, monitoring and mitigation report writing (see appendix 3).

10.11 Cumulative Impacts

The European Union Guidelines define cumulative impacts as: “Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. Therefore, the assessment of cumulative impacts for the proposed project considered the total impact associated with the proposed project when combined with other past, present, and reasonably foreseeable future developments projects. An examination of the potential for other projects to contribute cumulatively to the impacts on heritage resources from this proposed mining project was undertaken during the preparation of this report. The total impact arising from the proposed mining project (under the control of the applicant), other activities (that may be under the control of others, including other developers, local communities, government) and other background pressures and trends which may be unregulated. The project’s impact is therefore one part of the total cumulative impact on the environment. The analysis of a project’s incremental impacts combined with the effects of other projects can often give a more accurate understanding of the likely results of the project’s presence than just considering its impacts in isolation. The impacts of the proposed mining project were assessed by comparing the post-project situation to a pre-existing baseline. In this case there are agriculture fields and farmstead where baselines have already been affected, the proposed mining project will continue to add to the impacts in the area, it was deemed appropriate to consider the cumulative effects of proposed mining development.

This section considers the cumulative impacts that would result from the combination of the proposed mining development project. There are existing farming infrastructure and residential developments in the project area. As such increased development in the project area will have a number of cumulative impacts on heritage resource whether known or covered in the ground. For example, during mining phase they will be increase in human activity and movement of heavy mining and mining equipment and vehicles that could change, alter or destroy heritage

resources that may be buried beneath the surface. Cumulative impacts that could result from a combination of the proposed project and other actual or proposed future developments in the broader study area include site clearance and the removal of topsoil could result in damage to or the destruction of heritage resources that have not previously been recorded for example abandoned and unmarked graves. Heritage resources such as burial grounds and graves and archaeological and historical sites are common occurrences within the study area. These sites are often not visible and as a result, can be easily affected or lost. Vibrations and earth moving activities associated with mining has the potential to crack/damage graves marked by tombstones, which may occur in the greater study area. In addition, vibration from traffic has the potential to impact buildings and features of architectural and cultural significance.

No specific paleontological resources were found in the project area during the time of this study; however, this does not preclude the fact that paleontological resources may exist within the greater study area. As such, the proposed development has the potential to impact on possible paleontological resources in the area. Sites of archaeological, paleontological, or architectural significance were not specifically identified and cumulative effects are not applicable. The nature and severity of the possible cumulative effects may differ from site to site depending on the characteristics of the sites and variables.

Cumulative impacts that need attention are related to the impacts of access roads and impacts to buried heritage resources. Allowing the impact of the proposed mining development to go beyond the surveyed area would result in a significant negative cumulative impact on sites outside the surveyed area. Movement of heavy mining vehicles must be monitored to ensure that they do not drive beyond the approved site. No significant cumulative impacts, over and above those already considered in the impact assessment, are foreseen at this stage of the assessment process. Cumulative impacts can be significant, if mining equipment and vehicles are not monitored to avoid driving through undetected heritage resources.

Table 4: Summary of findings

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	One farmstead located on the site.
Areas to which oral traditions are attached or which are associated with intangible heritage	None exists
Historical settlements and townscapes	None survives in the proposed area.
Landscapes and natural features of cultural significance	None
Archaeological and palaeontological sites	None
Graves and burial grounds	Three traditional burial sites recorded at the site
Movable objects	None
Overall comment	The surveyed area has no identifiable archaeological remains on the surface but sub-surface chance finds are still possible (see Chance Finds Procedure). The 3 recorded burial sites need to be considered and protected. Therefore the planners ensure that the graves are protected or relocated in accordance with SAHRA Burial Grounds and graves Unit regulations and Section 36 of the NHRA.

11. DISCUSSION

Various archaeological and heritage specialist studies were conducted in the general project area since 2002. The current study should be read in conjunction with previous Phase 1 Impact Studies conducted in the general project area. These studies recorded sites of varying significance for example Birkholtz (2003), Pistorius (2004), Van Schalkwyk, (2007, 2011, 2016, 2017), Kusel (2010), Coetzee, (2012) which testify that the project area is a cultural landscape with high potential to yield significant Iron Age sites. The study noted that the proposed mining development site is located within a degraded area, and have reduced sensitivity for the presence of high significance archaeological remains due to previous disturbances resulting from mainly agriculture activities in the area. However, the absence of confirmable and significant archaeological cultural heritage sites is not evidence in itself that such sites did not exist in the proposed mining development site. There is potential of recovering significant archaeological remains beneath the surface. In addition, some sections were not easily accessible due to the steep nature of the project site. Significance of the sites of Interest is not limited to presence or absence of physical archaeological sites.

The findings by archaeological and heritage specialist attest to the fact that the project area may have been located within a rich LIA landscape. As such there is potential for encountering subsurface LIA remains ranges from medium to high on the proposed mining development site (See the appended Chance find procedure for handling of chance finds). The lack of confirmable archaeological sites recorded during the current survey is thought to be a result of previous clearance and ploughing that may have destroyed surface remains. In addition, surface visibility was compromised by thick vegetation cover. It should be noted that significance of the site of Interest (Mining Right application sites) is not limited to presence or absence of physical archaeological sites.

12. RECOMENDATIONS

1. From a heritage perspective supported by the findings of this study, the proposed mining development and associated developments are feasible. However, the proposed mining development should be approved to proceed as planned under observation that the development dimensions do not extend beyond the proposed site.
2. All the recorded burial sites (GMRBS1,2&3) must be demarcated by a danger warning sign and must be clearly marked to avoid any accidental damage by especially heavy construction and haulage trucks.
3. The applicant must ensure that the descendants of the recorded graves are sought, and notified about this proposed development has an impact (directly or indirectly) on their burial site.
4. No stone robbing, or removal of any material is allowed. Any disturbance or alteration on this burial site would be illegal and punishable by law, under Section 36(3) of the NHRA.
5. Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA.
6. The foot print impact of the proposed mining development and associated infrastructure should be kept to minimal to limit the possibility of encountering chance finds.
7. Should any unmarked burials be exposed during mining, affected families must be tracked and consulted, relevant rescue/ relocation permits must be obtained from SAHRA before any grave relocation can take place. Furthermore a professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act 25 of 1999.
8. Should chance archaeological materials or human burials remains be exposed during mining work on any section of the proposed mining development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in mining scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA regulations (see appended Chance Find procedure for further details).
9. The Project Public Participation Process should ensure that any cultural heritage related matters for this project are given due attention whenever they arise and are communicated to PHRA throughout the proposed project development. This form of extended community involvement would pre-empty

any potential disruptions that may arise from previously unknown cultural heritage matter that may have escaped the attention of this study.

10. All land owners must be requested to declare burial sites within their farmsteads and cane fields to the EAP.
11. Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP there are no other significant cultural heritage resources barriers to the proposed mining right application. The Heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations here in made.

13. CONCLUSION

Integrated Specialist Services (Pty) Ltd was retained by Singo Consulting (Pty) Ltd to carry out HIA for the proposed mining right application, as required by heritage legislation. The recorded burial sites must be protected and the planners must ensure that they avoid the sites on their final mining layout plan. The proposed mining right site has been significantly altered over several years of corn production. It was anticipated that if any archaeological remains existed in the area, developments such agriculture and associated infrastructure developments should have exposed them. In spite of the rich history and archaeology of the general area prior to commercial agriculture developments after the mid-20th century, field surveys on and around the proposed mining right area did not yield any archaeological material. The potential for chance finds, still remains and the developer and his contractors are advised to be diligent and observant during clearance of the mining site. The procedure for reporting chance finds has clearly been laid out and if this report is adopted by SAHRA, then there are no archaeological reasons why mining right application cannot be approved. However, it must be approved subject to burial sites located in within the site being protected and adequate buffer zones being provided for.

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15. APPENDIX 1 CHANCE FIND PROCEDURE FOR MINING RIGHT APPLICATION IN MSUKALIGWA LOCAL MUNICIPALITY AND GERT SIBANDE DISTRICT IN MPUMALANGA PROVINCE

July 2019

ACRONYMS

BGG	Burial Grounds and Graves
CFPs	Chance Find Procedures
ECO	Environmental Control Officer
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
ISS	Integrated Specialist Services (Pty) Ltd
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Authority
SAPS	South African Police Service
UNESCO	United Nations Educational, Scientific and Cultural Organisation

CHANCE FIND PROCEDURE

INTRODUCTION

An Archaeological Chance Find Procedure (CFP) is a tool for the protection of previously unidentified cultural heritage resources during mining. The main purpose of a CFP is to raise awareness of all mine workers and management on site regarding the potential for accidental discovery of cultural heritage resources and establish a procedure for the protection of these resources. Chance Finds are defined as potential cultural heritage (or paleontological) objects, features, or sites that are identified outside of or after Heritage Impact studies, normally as a result of mining monitoring. Chance Finds may be made by any member of the project team who may not necessarily be an archaeologist or even visitors. Appropriate application of a CFP on development projects has led to discovery of cultural heritage resources that were not identified during archaeological and heritage impact assessments. As such, it is considered to be a valuable instrument when properly implemented. For the CFP to be effective, the site manager must ensure that all personnel on the proposed mining development site understand the CFP and the importance of adhering to it if cultural heritage resources are encountered. In addition, training or induction on cultural heritage resources that might potentially be found on site should be provided. In short the Chance find procedure details the necessary steps to be taken if any culturally significant artefacts are found during mining.

DEFINITIONS

In short the term 'heritage resource' includes structures, archaeology, meteors, and public monuments as defined in the South African National Heritage Resources Act (Act No. 25 of 1999) (NHRA) Sections 34, 35, and 37. Procedures specific to burial grounds and graves (BGG) as defined under NHRA Section 36 will be discussed separately as this require the implementation of separate criteria for CFPs.

BACKGROUND

Proposed mining development site is subject to heritage survey and assessment at planning stage in accordance with the NHRA. These surveys are based on surface indications alone and it is therefore possible that sites or significant archaeological remains can be missed during surveys because they occur beneath the surface. These are often accidentally exposed in the course of mining or any associated construction work and hence the need for a Chance Find Procedure to deal with accidental finds. In this case an extensive Archaeological Impact Assessment was completed by Mlilo (2019) over a large area earmarked for EMP

upgrade. The AIA/HIA conducted was very comprehensive covering the entire site. The studies did not record any significant archaeological or heritage resources.

PURPOSE

The purpose of this Chance Find Procedure is to ensure the protection of previously unrecorded heritage resources within the proposed mining development site. This Chance Find Procedure intends to provide the applicant and contractors with appropriate response in accordance with the NHRA and international best practice. The aim of this CFP is to avoid or reduce project risks that may occur as a result of accidental finds whilst considering international best practice. In addition, this document seeks to address the probability of archaeological remains finds and features becoming accidentally exposed during earth moving and ground altering activities during mining. The proposed mining activities have the potential to cause severe impacts on significant tangible and intangible cultural heritage resources buried beneath the surface or concealed by vegetation cover. ISS developed this Chance Find Procedure to define the process which govern the management of Chance Finds during mining. This ensures that appropriate treatment of chance finds while also minimizing disruption of the construction schedule. It also enables compliance with the NHRA and all relevant regulations. Archaeological Chance Find Procedures are to promote preservation of archaeological remains while minimizing disruption of mining scheduling. It is recommended that due to the low to moderate archaeological potential of the project area, all site personnel and contractors be informed of the Archaeological Chance Find procedure and have access to a copy while on site. This document has been prepared to define the avoidance, minimization and mitigation measures necessary to ensure that negative impacts to known and unknown archaeological remains as a result of project activities and are prevented or where this is not possible, reduced to as low as reasonably practical during mining.

Thus this Chance Finds Procedure covers the actions to be taken from the discovering of a heritage site or item to its investigation and assessment by a professional archaeologist or other appropriately qualified person to its rescue or salvage.

CHANCE FIND PROCEDURE

General

The following procedure is to be executed in the event that archaeological material is discovered:

- All construction/clearance/ mining activity in the vicinity of the accidental find/feature/site must cease immediately to avoid further damage to the find site.

- Briefly note the type of archaeological materials you think you've encountered, and their location, including, if possible, the depth below surface of the find
- Report your discovery to your supervisor or if they are unavailable, report to the project ECO who will provide further instructions.
- If the supervisor is not available, notify the Environmental Control Officer immediately. The Environmental Control Officer will then report the find to the Site Manager who will promptly notify the project archaeologist and SAHRA.
- Delineate the discovered find/ feature/ site and provide 25m buffer zone from all sides of the find.
- Record the find GPS location, if able.
- All remains are to be stabilised *in situ.*
- Secure the area to prevent any damage or loss of removable objects.
- Photograph the exposed materials, preferably with a scale (a yellow plastic field binder will suffice).
- The project archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.

- **Finds rescue strategy**: All investigation of archaeological soils will be undertaken by hand, all finds, remains and samples will be kept and submitted to a Museum as required by the heritage legislation. In the event that any artefacts need to be conserved, the relevant permit will be sought from the SAHRA.
- An on-site office and finds storage area will be provided, allowing storage of any artefacts or other archaeological material recovered during the monitoring process.
- In the case of human remains, in addition to the above, the SAHRA Burial Ground Unit will be contacted and the guidelines for the treatment of human remains will be adhered to. If skeletal remains are identified, an archaeological will be available to examine the remains.
- The project archaeologist will complete a report on the findings as part of the permit application process.
- Once authorisation has been given by SAHRA, the Applicant will be informed when mining activities can resume.

MANAGEMENT OF CHANCE FINDS

Should the Heritage specialist conclude that the find is a heritage resource protected in terms of the NRHA (1999) Sections 34, 36, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), ISS will notify SAHRA and/or PHRA on behalf of the applicant. SAHRA/PHRA may require that a search and rescue exercise be conducted in terms of NHRA Section 38, this may include rescue excavations, for which ISS will submit a rescue permit application having fulfilled all requirements of the permit application process.

In the event that human remains are accidently exposed, SAHRA Burial Ground Unit or ISS Heritage Specialist must immediately be notified of the discovery in order to take the required further steps:

a. Heritage Specialist to inspect, evaluate and document the exposed burial or skeletal remains and determine further action in consultation with the SAPS and Traditional authorities:

b. Heritage specialist will investigate the age of the accidental exposure in order to determine whether the find is a burial older than 60 years under the jurisdiction of SAHRA or that the exposed burial is younger than 60 years under the jurisdiction of the Department of Health in terms of the Human Tissue Act.

c. The local SAPS will be notified to inspect the accidental exposure in order to determine where the site is a scene of crime or not.

d. Having inspected and evaluated the accidental exposure of human remains, the project Archaeologist will then track and consult the potential descendants or custodians of the affected burial.

e. The project archaeologist will consult with the traditional authorities, local municipality and SAPS to seek endorsement for the rescue of the remains. Consultation must be done in terms of NHRA (1999) Regulations 39, 40, 42;

f. Having obtained consent from affected families and stakeholders, the project archaeologist will then compile a Rescue Permit application and submit to SAHRA Burial Ground and Graves Unit.

g. As soon as the project archaeologist receives the rescue permit from SAHRA he will in collaboration with the company/contractor arrange for the relocation in terms of logistics and appointing of an experienced undertaker to conduct the relocation process.

h. The rescue process will be done under the supervision of the archaeologist, the site representative and affected family members. Retrieval of the remains shall be undertaken in such a manner as to reveal the stratigraphic and spatial relationship of the human skeletal remains with other archaeological features in the excavation (e.g., grave goods, hearths, burial pits, etc.). A catalogue and bagging system shall be utilised that will allow ready reassembly and relational analysis of all elements in a laboratory. The remains will not be touched with the naked hand; all Contractor personnel working on the excavation must wear clean cotton or non-powdered latex gloves when handling remains in order to minimise contamination of the remains with modern human DNA. The project archaeologist will document the process from exhumation to reburial.

i. Having fulfilled the requirements of the rescue/burial permit, the project archaeologist will compile a mitigation report which details the whole process from discovery to relocation. The report will be submitted to SAHRA and to the company.

Note that the relocation process will be informed by SAHRA Regulations and the wishes of the descendants of the affected burial.

16. APPENDIX 2: HERITAGE MANAGEMENT PLAN INPUT INTO THE PROPOSED MINING RIGHT APPLICATION

Objective	• Protection of archaeological sites and land considered to be of cultural value; • Protection of known physical cultural property sites against vandalism, destruction and theft; and • The preservation and appropriate management of new archaeological finds should these be discovered during mining.							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Planning	Ensure all known sites of cultural, archaeological, and historical significance are demarcated on the site layout plan, and marked as no-go areas.	Throughout Project	Weekly Inspection	Contractor [C] CECO	SM	ECO	EA EM PM
Construction Phase								
1	Emergency Response	Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of mining, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue.	N/A	Throughout	C CECO	SM	ECO	EA EM PM
		Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or PHRA official must be called to site for inspection.		Throughout	C CECO	SM	ECO	EA EM PM
		Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed form site;		Throughout	C CECO	SM	ECO	EA EM PM
		Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Mine Manager who in turn will inform PHRA.		When necessary	C CECO	SM	ECO	EA EM PM
		Should any remains be found on site that is potentially human remains, the PHRA and South African Police Service should be contacted.		When necessary	C CECO	SM	ECO	EA EM PM
Rehabilitation Phase								
		Same as mining phase.						
Operational Phase								
		Same as mining phase.						

17. Appendix 3: heritage mitigation measure table

SITE REF	HERITAGE ASPECT	POTENTIAL IMPACT	MITIGATION MEASURES	RESPONSIBLE PARTY	PENALTY	METHOD STATEMENT REQUIRED
Chance Archaeological and Burial Sites	General area where the proposed project is situated is a historic landscape, which may yield archaeological, cultural property, remains. There are possibilities of encountering unknown archaeological sites during subsurface construction and mining work which may disturb previously unidentified chance finds.	Possible damage to previously unidentified archaeological and burial sites during mining phase. • Unanticipated impacts on archaeological sites where project actions inadvertently uncovered significant archaeological sites. • Loss of historic cultural landscape; • Destruction of burial sites and associated graves • Loss of aesthetic value due to mining work • Loss of sense of place Loss of intangible heritage value due to change in land use	In situations where unpredicted impacts occur mining activities must be stopped and the heritage authority should be notified immediately. Where remedial action is warranted, minimize disruption in mining scheduling while recovering archaeological data. Where necessary, implement emergency measures to mitigate. • Where burial sites are accidentally disturbed during mining, the affected area should be demarcated as no-go zone by use of fencing during mining, and access thereto by the construction and mining teams must be denied. • Accidentally discovered burials in development context should be salvaged and rescued to safe sites as may be directed by relevant heritage authority. The heritage officer responsible should secure relevant heritage and health authorities permits for possible relocation of affected graves accidentally encountered during construction and mining work.	• Contractor / • Project Manager • Archaeologist • Project EO	Fine and or imprisonment under the PHRA Act & NHRA	Monitoring measures should be issued as instruction within the project EMP. PM/EO/Archaeologists Monitor construction and mining work on sites where such development projects commences within the farm.

18. APPENDIX 4: LEGAL PRINCIPLES OF HERITAGE RESOURCES MANAGEMENT IN SOUTH AFRICA

Extracts relevant to this report from the National Heritage Resources Act No. 25 of 1999, (Sections 5, 36 and 47):

General principles for heritage resources management

5. (1) All authorities, bodies and persons performing functions and exercising powers in terms of this Act for the management of heritage resources must recognise the following principles:

(a) Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;

(b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;

(c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and

(d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.

(2) To ensure that heritage resources are effectively managed—

(a) the skills and capacities of persons and communities involved in heritage resources management must be developed; and

(b) provision must be made for the ongoing education and training of existing and new heritage resources management workers.

(3) Laws, procedures and administrative practices must—

(a) be clear and generally available to those affected thereby;

(b) in addition to serving as regulatory measures, also provide guidance and information to those affected thereby; and

(c) give further content to the fundamental rights set out in the Constitution.

(4) Heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.

(5) Heritage resources contribute significantly to research, education and tourism and they must be developed and presented for these purposes in a way that ensures dignity and respect for cultural values.

(6) Policy, administrative practice and legislation must promote the integration of heritage resources conservation in urban and rural planning and social and economic development.

(7) The identification, assessment and management of the heritage resources of South Africa must—

(a) take account of all relevant cultural values and indigenous knowledge systems;

(b) take account of material or cultural heritage value and involve the least possible alteration or loss of it;

(c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;

(d) contribute to social and economic development;

(e) safeguard the options of present and future generations; and

(f) be fully researched, documented and recorded.

Burial grounds and graves

36. (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources
authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in

terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

(7) (a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.

(b) The Minister must publish such lists as he or she approves in the Gazette.

(8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.

(9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

General policy

47. (1) SAHRA and a provincial heritage resources authority—

(a) must, within three years after the commencement of this Act, adopt statements of general policy for the management of all heritage resources owned or controlled by it or vested in it; and

(b) may from time to time amend such statements so that they are adapted to changing circumstances or in accordance with increased knowledge; and

(c) must review any such statement within 10 years after its adoption.

(2) Each heritage resources authority must adopt for any place which is protected in terms of this Act and is owned or controlled by it or vested in it, a plan for the management of such place in accordance with the best environmental, heritage conservation, scientific and educational principles that can reasonably be applied taking into account the location, size and nature of the place and the resources of the authority concerned, and may from time to time review any such plan.

(3) A conservation management plan may at the discretion of the heritage resources authority concerned and for a period not exceeding 10 years, be operated either solely by the heritage resources authority or in conjunction with an environmental or tourism authority or under contractual arrangements, on such terms and conditions as the heritage resources authority may determine.

(4) Regulations by the heritage resources authority concerned must provide for a process whereby, prior to the adoption or amendment of any statement of general policy or any conservation management plan, the public and interested organisations are notified of the availability of a draft statement or plan for inspection, and comment is invited and considered by the heritage resources authority concerned.

(5) A heritage resources authority may not act in any manner inconsistent with any statement of general policy or conservation management plan.

(6) All current statements of general policy and conservation management plans adopted by a heritage resources authority must be available for public inspection on request.