Heritage Assessment

HERITAGE UNIT

The De Wittekrans Project, Mashala Resources, Hendrina, Mpumalanga

Version 2.0

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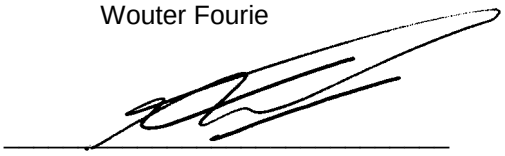
SIGNATURE: 

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EXECUTIVE SUMMARY

PGS Heritage & Grave Relocation Consultants was appointed by GCS (Pty) Ltd to undertake a Heritage Impact Assessment (HIA) that forms part of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the De Wittekrans Project of Mashala Resources, close to Hendrina, Mpumalanga.

During the survey 36 sites of heritage significance were identified.

The heritage sites consist of 29 cemeteries with a total of approximately 352 graves, 6 farmsteads and one rock arts site. The rock art site is located within a kilometre radius from the eastern most boundary of the study area and 1.9kilometres from the closest mining activity.

The following mitigations measures are recommended for the heritage site identified where they are to be impacted by the mining project.

Graves and Cemeteries

Mitigation of these sites will require a fence around the cemetery with a buffer of at least 20 meters. The mining impact will have a direct impact on **Sites 14 and 19** and it is recommended that the graves be relocated after a full grave relocation process that includes comprehensive social consultation. The grave relocation process must include:

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

Alternatively the mining boundaries can be adjusted to demarcate the positions of the two cemeteries or exclude the cemeteries where possible.

Houses and Farmsteads

The mining impact will be direct on **Site 13** and the destruction of the site will be required a destruction permit under Section 34 of the NHRA will be required. This permit will only be granted after the site has been documented in its entirety by layout sketches of each structure and the farmstead layout, photographic documentation and historical background of the farmstead. Further to this it is recommended that a full background research on the history of the farmstead and oral history be done together with the documentation of the physical structures.

Rock Art site

The impact evaluation from blasting on the site has determined that, "*The distance between the rock art site and the side of pit 3 is in excess of 1 780m and the vibration level at this distance will be below 3.0mm/s which will not create destruction of the existing rock art. The recommended vibration level for poorly constructed historical sites and/or clay buildings is 10mm/s before any damage to the building may occur. Due to the lack of recommended vibration levels for such rock art sites the recommended vibration level of 10mm/s will be used as a baseline figure. The design of the blast will be done according to the blast design chart to ensure minimum impact on the sensitive sites*."

Further evaluation of the possible impact by dust from the mining project has concluded that:

"The amended plan now has the nearest opencast activity in excess of 2km from the rock art site.
Settling dust is more of an issue for the rock art than floating dust. Settling dust typically has a diameter far larger than PM10 but PM10 is used as an easily modelled indicator of likely flow patterns (as explained earlier).
The modelling results indicate that the rock art area is unlikely to be heavily impacted. In support of this is the fact that, generally, the wind flow is easterly. i.e., the wind generally blows from the rock site, towards the mine. Cumulative impacts over the life of the mine could become a problem however. Thus, precautions against dust contamination should be taken."

Although the site is not directly in the proposed project area, it is within a 1.9 kilometer from the closest open cast area, monitoring of the site on a quarterly and annual basis to assess the possible impact of the mining activities on the site. Such a management/monitoring program needs to be incorporated into the current research program on the site.

The following general mitigation measures are recommended:

- A Monitoring plan or watching brief must be agreed upon by all the stakeholders for the different phases of the project. The developer undertakes to give the archaeologist sufficient time to identify and record and archaeological finds and features.
- If during construction any possible finds are made, the operations must be stopped and the qualified archaeologist be contacted for an assessment of the find.
- A heritage resources management plan must be developed for managing the heritage resources in the surface area impacted by mining operations during construction and operation of the development. This includes basic training for construction staff on possible finds, action steps for mitigation measures, surface collections, excavations, and communication routes to follow in the case of a discovery.

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1. INTRODUCTION

PGS Heritage & Grave Relocation Consultants was appointed by GCS (Pty) Ltd to undertake a Heritage Impact Assessment (HIA) that forms part of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the De Wittekrans Project of Mashala Resources, close to Hendrina, Mpumalanga.

The aim of the study is to identify all heritage sites, document, and assess their importance within Local, Provincial and National context. From this we aim to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

The report outlines the approach and methodology utilised before and during the survey, which includes in Phase 1: Information collection from various sources and public consultations; Phase 2: Physical surveying of the area on foot and by vehicle; and Phase 3: Reporting the outcome of the study.

General site conditions and features on site were recorded by means of photos, COORDINATES location, and description. Possible impacts were identified and mitigation measures are proposed in the following report.

This report must also be submitted to SAHRA's provincial office for scrutiny.

2. APPROACH AND METHODOLOGY

The aim of the study is to extensively cover all data available to compile a background history of the study area; this was accomplished by means of the following phases.

2.1. PROJECT DESCRIPTION

Mashala Hendrina Coal (Pty) Ltd (Mashala) has applied for a mining right in respect of coal reserves on Portions 5, 7, 10, 11 and the remaining extents of Portions 1 and 2 of the farm De Wittekrans 218 IS, the remaining extent of Portion 1 of the farm Tweefontein 203 IS, the remaining extent of the farm Groblershoek 191 IS and all portions on the farm Groblershoop 192 IS and Israel 207 IS. The project area is situated between the towns of Ermelo and Hendrina in the Mpumalanga Province, on the western side of the N11. It is the intention of Mashala to develop a coal mine (both opencast and underground activities will be undertaken) on the above-mentioned properties.

The proposed mining area is approximately 3 193ha in size. The proposed mining method is conventional opencast mining, making use of the roll-over method, while the standard bord and pillar mining method will be used for the underground sections. Rehabilitation will take place on an ongoing basis.

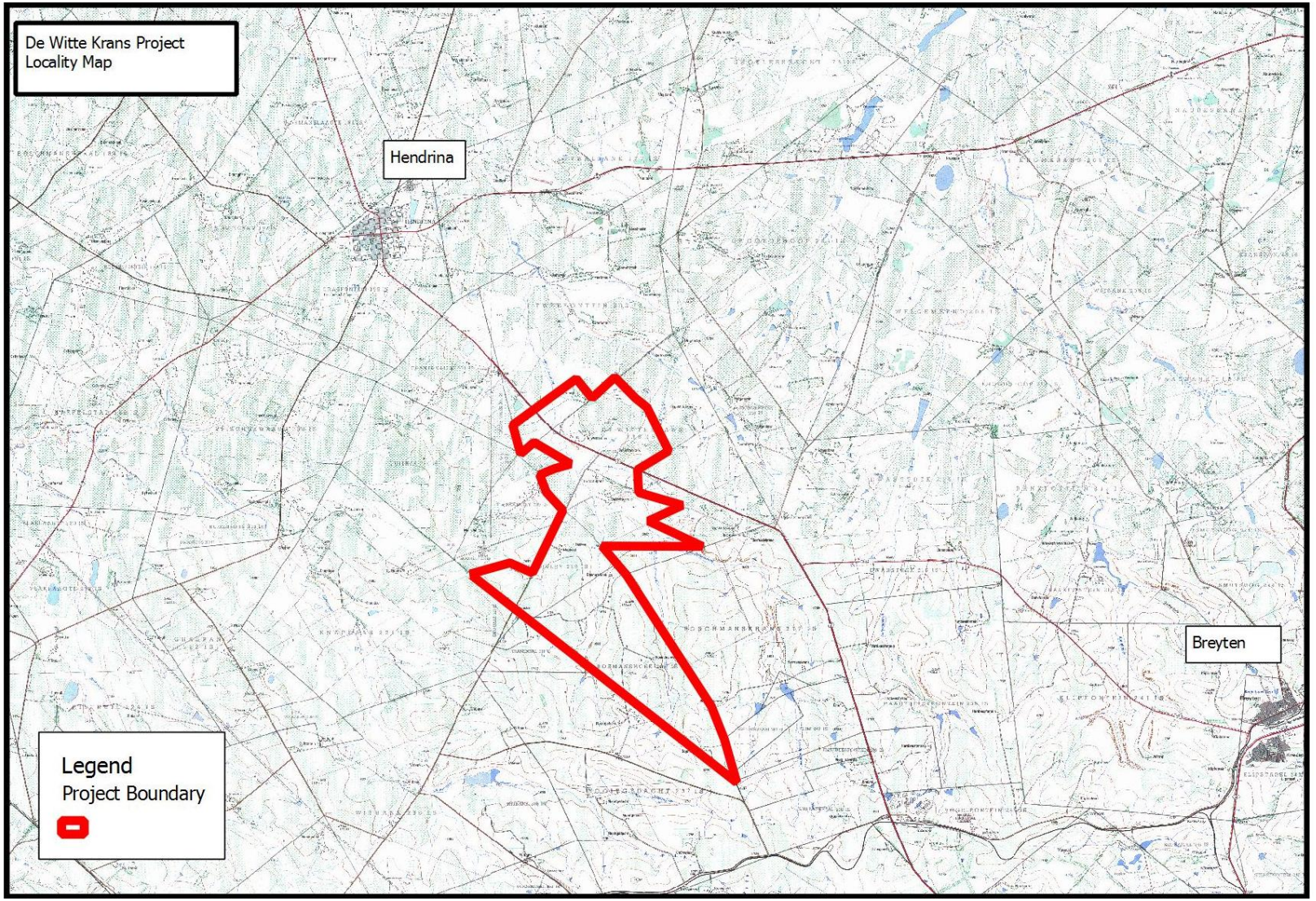


Figure 1 – Locality Map

2.2 PHYSICAL SURVEYING

The study area for the proposed projects covers approximately 5000 hectares. Due to the nature of cultural remains, with the majority of artefacts occurring below surface, an intensive foot-survey that covered the study area was conducted. A controlled-exclusive surface survey was conducted over a period of three days, by means of vehicle and extensive surveys on foot by two archaeologists of PGS Heritage Unit.

Aerial photographs and 1:50 000 maps of the area were consulted and literature on the area were studied before undertaking the survey. The purpose of this was to identify topographical areas of possible historic and pre-historic activity. All sites discovered both inside and bordering the proposed development areas were plotted on 1:50 000 maps and their GPS co-ordinates noted. In addition digital photographs were used to document all the sites.

3. LEGISLATIVE REQUIREMENTS AND TERMINOLOGY

3.1 Legislation

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

i. National Environmental Management Act (NEMA) Act 107 of 1998
ii. National Heritage Resources Act (NHRA) Act 25 of 1999
iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
iv. Development Facilitation Act (DFA) Act 67 of 1995

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

i. National Environmental Management Act (NEMA) Act 107 of 1998
    a. Basic Environmental Assessment (BEA) – Section (23)(2)(d)
    b. Environmental Scoping Report (ESR) – Section (29)(1)(d)
    c. Environmental Impacts Assessment (EIA) – Section (32)(2)(d)
    d. Environmental Management Plan (EMP) – Section (34)(b)
ii. National Heritage Resources Act (NHRA) Act 25 of 1999
    a. Protection of Heritage resources – Sections 34 to 36; and
    b. Heritage Resources Management – Section 38
iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
    a. Section 39(3)
iv. Development Facilitation Act (DFA) Act 67 of 1995
    a. The GNR.1 of 7 January 2000: Regulations and rules in terms of the Development Facilitation Act, 1995. Section 31.

3.2 Terminology

Acronyms	*Description*
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEAT	Department of Environmental Affairs and Tourism
DWAF	Department of Water Affairs and Forestry
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
PSSA	Palaeontological Society of South Africa
ROD	Record of Decision
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency

Archaeological resources

This includes:

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

Cultural significance

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

Development

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

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

Heritage resources

This means any place or object of cultural significance

4. ASSESSMENT CRITERIA

This chapter describes the evaluation criteria used for the sites listed below.

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

- **site integrity** (i.e. primary vs. secondary context),
- **amount of deposit, range of features** (e.g., stonewalling, stone tools and enclosures),
- **uniqueness** and
- **potential** to answer present research questions.

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

A - No further action necessary;

B - Mapping of the site and controlled sampling required;

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

D - Preserve site

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region, were used for the purpose of this report.

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

4.1 SIGNIFICANCE OF POSSIBLE IMPACTS

4.2 Risk to the Environment

Occurrence

- probability of occurrence (how likely is it that the impact may occur?), and
- duration of occurrence (how long may it last?).

Severity

- magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and
- scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

In order to assess each of these factors for each impact, the following ranking scales were used:

Table 0.1 Ranking Scales

Probability:=P	*Duration:=D*
5 – Definite/don't know	5 – Permanent
4 – Highly probable	4 - Long-term (ceases with the operational
3 – Medium probability	life)
2 – Low probability	3 - Medium-term (5-15 years)
1 – Improbable	2 - Short-term (0-5 years)
0 – None	1 – Immediate
Scale:=S	*Magnitude:=M*
5 – International	10 - Very high/don't know
4 – National	8 – High
3 – Regional	6 – Moderate
2 – Local	4 – Low
1 – Site only	2 – Minor
0 – None	

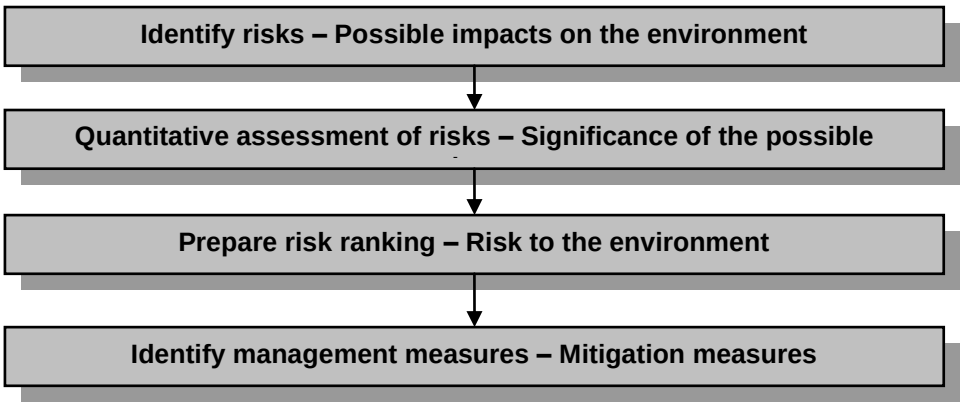
Once the above factors had been ranked for each impact, the environmental significance of each was assessed using the following formula:

SP = (magnitude + duration + scale) x probability

The maximum value is 100 significance points (SP). Environmental effects were rated as either of high, moderate or low significance on the following basis:

- More than 60 significance points indicated high (H) environmental significance.
- Between 30 and 60 significance points indicated moderate (M) environmental significance.
- Less than 30 significance points indicated low (L) environmental significance.

The following process will be followed:



4.2.2 Impact Rating

Impact	Impact Significance	Heritage Significance	Certainty	Duration	Mitigation
Negative	Moderate	Grade GP.B	Possible	Short term	B

5. BACKGROUND OF AREA

5.1 Archaeological Time frame

The Stone Age is divided in Earlier; Middle and Later Stone Age and refers to the earliest people of South Africa who mainly relied on stone for their tools.

Earlier Stone Age: The period from ± 2.5 million yrs - ± 250 000 yrs ago. Acheulean stone tools are dominant.

Middle Stone Age: Various lithic industries in SA dating from ± 250 000 yrs – 22 000 yrs before present.

Later Stone Age: The period from ± 22 000-yrs before present to the period of contact with either Iron Age farmers or European colonists.

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the Pre-Historic and Historic periods. Similar to the Stone Age, it too can be divided into three periods:

The Early Iron Age: Most of the first millennium AD.

The Middle Iron Age: 10th to 13th centuries AD

The Late Iron Age: 14th century to colonial period.

5.2 Historical Time frame

5.2.1 Cartographic material

Topographical Maps dated 1955

The 1955 topographical maps of the study area was studied and numerous indications of huts, farmsteads and cemeteries where identified. Figure 2 indicates the identified structures that was visited during the area survey.

5.2.2 Hendrina

Hendrina was founded in 1916, serving as a commercial, religious, and educational centre for the Afrikaans farming community, who came to camp on the town square every quarter for communion. The first shopkeepers were Libanese traders who played an important role in the history of Hendrina (www.mydestination.co.za).

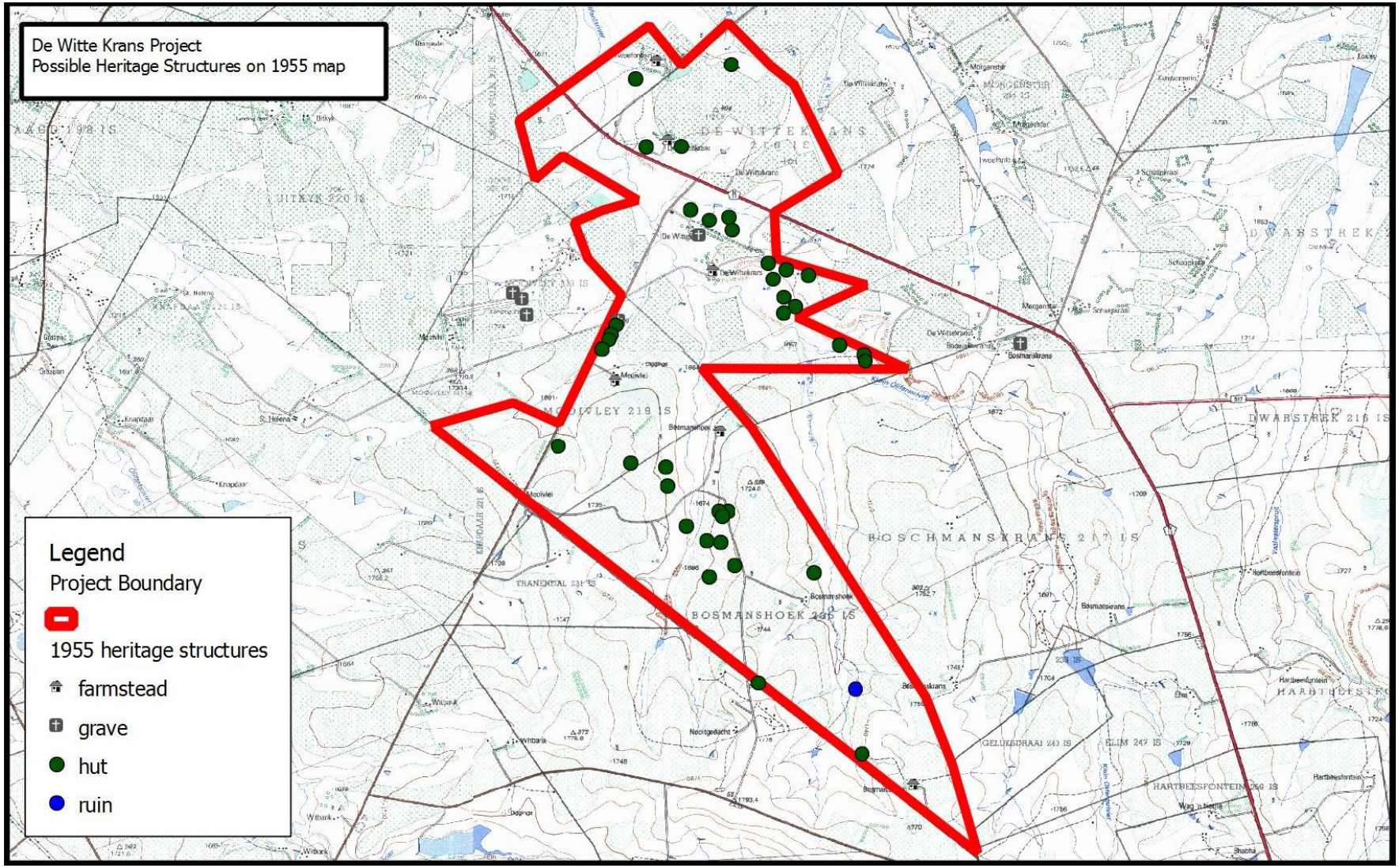


Figure 2 –Topographical Sheets of the study area indicating possible heritage sites that were investigated, dated 1955

6. HERITAGE SITES

During the survey a total of 35 heritage sites were identified that were inside the study area.

The area is situated on topographical maps 2629BB, BC, and BD. The area is characterised by rolling fields covered with maize and potato crops, ridges and open fields. The larger part of the area is currently utilised for maize farming.

6.1 Site 1

Coordinates: 26,24244 S 29,79714 E

A small informal, fenced cemetery with approximately 30 graves was identified at this location. The graves were situated in an open grass field. The graves were placed in several lines and were orientated from east to west. Six of the graves had formal cement and granite dressings and the rest had informal stone packed dressings. The graves were overgrown with grass, but it was evident that they were regularly maintained.

Site size: Approximately 30m x 30m.

Figure 3 - General view of site

Heritage Evaluation		Environmental Significance before Mitigation				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.2 Site 2

Coordinates: 26,24426 S 29,79420 E

A small informal cemetery with approximately 7 graves was identified at this location. The graves were placed in a line and were orientated from east to west. One of the graves had a cement dressing and headstone, but the rest of the graves had informal stone packed dressings. The graves were overgrown with grass.

Site size: Approximately 5m x 20m.

Figure 4 -General view of site

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no. mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.3 Site 3

*Coordinates***:** 26,24330 S 29,79520 E

A small informal cemetery with approximately 7 graves was identified at this location. The graves were placed in a haphazard fashion together in a cluster. The graves were orientated from east to west and they all had informal stone packed dressings. The graves were overgrown with grass.

Site size: Approximately 10m x 20m

Figure 5 - General view of site

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.4 Site 4

*Coordinates***:** 26,23939 S 29,79623 E

A small informal cemetery with approximately 13 graves was identified here. The graves were placed in a line next to each other in an open grass field. The graves were orientated from east to west. Three of the graves had formal cement and granite dressings, but the rest of the graves had informal stone packed dressings. The graves were overgrown with grass.

Site size: Approximately 5m x 20m

Figure 6 - General view of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.5 Site 5

*Coordinates***:** 26,23940 S 29,79539 E

A small informal, crudely fenced cemetery with 4 graves was identified here. The graves were placed in a line next to each other in an open grass field. The graves were orientated from east to west and had informal stone packed dressings. The informal graves were overgrown with grass.

Site size: Approximately 5m x 10m

Figure 7 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.6 Site 6

*Coordinates***:** 26,24249 S 29,77201 E

The dilapidated remains of an old farm house and its outbuildings were identified at this location.

Site size: Approximately 100m x 100m

Figure 8 - General view of site

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Establish baseline data and monitoring on bi-annual and annual basis.

6.7 Site 7

Coordinates: 26,24580 S 29,77091 E

A small cemetery with four graves was identified here. The graves were placed in a line next to each other and were orientated from east to west. The graves were found in an open grass field and were overgrown with grass. Three of the graves had formal cement dressings and headstones and the other grave had an informal stone packed dressing.

Site size: Approximately 5m x 10m.

Figure 9 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.8 Site 8

Coordinates: 26,25465 S 29,77072 E

The dilapidated remains of an old farm house and its outbuildings were identified at this location.

Site size: Approximately 100m x 100m

Figure 10 - View of farmstead

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.B	C	6	4	1	4	Med
Establish baseline data and monitoring on bi-annual and annual basis		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		4	4	1	3	Low

Mitigation: Establish baseline data and monitoring on bi-annual and annual basis

6.9 Site 9

*Coordinates***:** 26,24576 S 29,81020 E

An extended overhang with several panels of rock art was identified here. The area with the rock art extended for approximately 120m and contained various panels of rock art which were placed strategically in the shelters and overhangs of the exposed cliff. The cliff and art was on the southern side and next to the Klein Olifants River. The rock art varied from the earlier San/bushmen art to the later Khoenkhoen rock art. A wide range of animals, humans in different poses and geometrical symbols/figures were depicted. The rock art was outside of the indicated study area, but were deemed close enough and important enough to include in the study.

A report (2009) by Dr. Sven Ouzman from the Department of Anthropology and Archaeology at the University of Pretoria as commissioned by the local farming community describes the site as follows:

"The recently-discovered indigenous rock paintings on the De Wittekrans farm, just outside Hendrina, Mpumalanga, are of exceptional interest to South African heritage in general and archaeology in particular. There are at least four rock art sites, which include the most complex Khoekhoen herder rock paintings yet found in Mpumalanga. Indeed, this site complex is one of South Africa's most interesting and significant Khoekhoen herder rock art locales. At present, the sites are threatened by natural process such as weathering, rock degradation and so on, with minimal human damage, thanks to excellent site custodianship by the property's owners. However, the planned coal mine less than a kilometer from the site, will cause damage to the site through dust, vibrations and increased human visitation."

"De Wittekrans is thus a key site – one of the top 3 in South Africa – in terms of Khoekhoen herder art research, and must be preserved at all costs."

At the stage of Dr. Ouzman's evaluation (September 2009) the planned mining activity was approximately ***1.2 kilometers*** to the south west of the site. After incorporating all the specialist studies and having environmental restrictions influence the mining layout the closest mining activity is an opencast pit some ***1.9 kilometers*** to the west of the rock art site.

The site is highly significant and can possibly be graded as of National Significance (Grade 1).

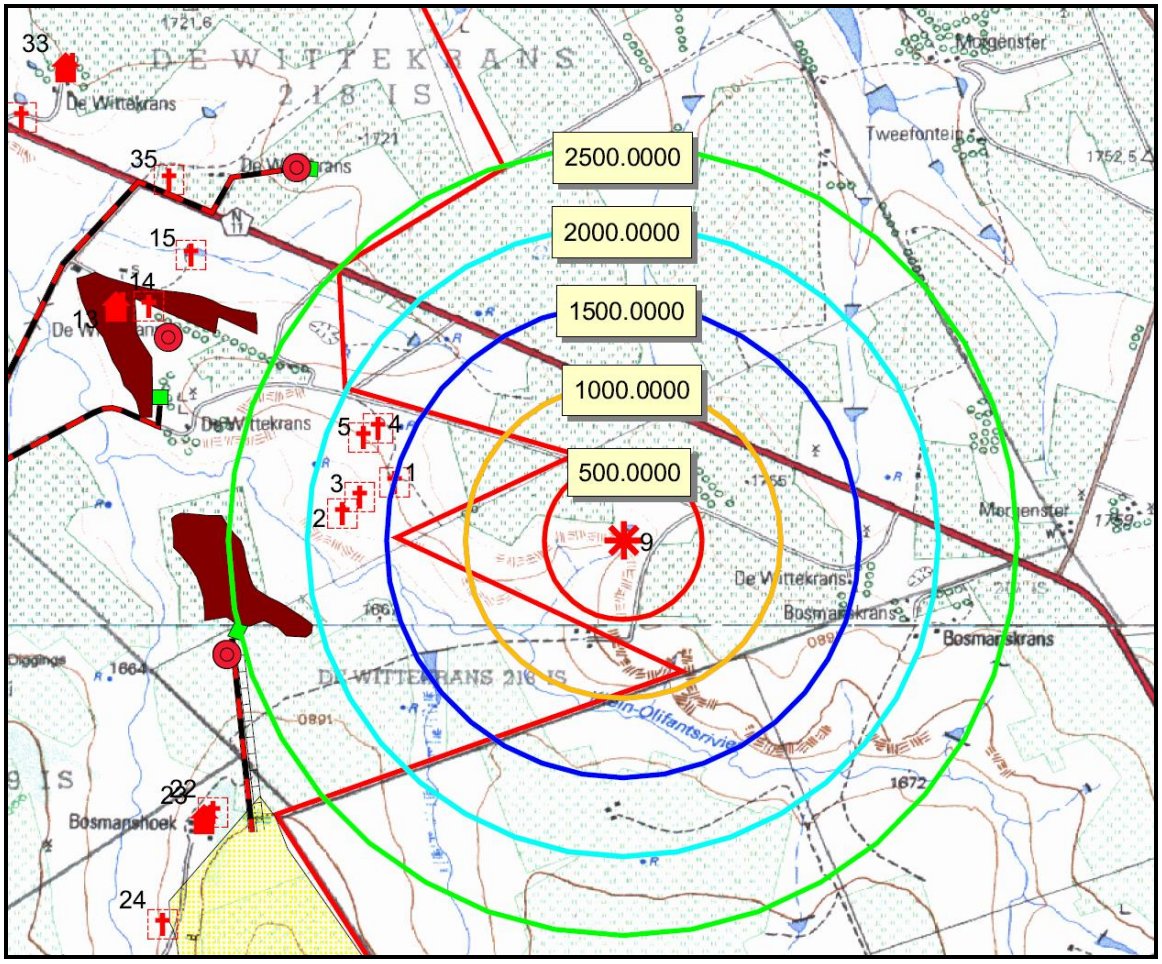


Figure 11 – Distances from closest mining infrastructure. Brown areas are proposed opencast pits.

Site size: Approximately 40m x 120m

Figure 12 - View of site and overhang

6.9.1 Impacts on site

The danger of impacts in the site by mining activity has been listed as:

Natural factors:

- weathering, wind, water and sun damage, veld fires, vegetation scratching paintings, natural rock decay, and seismic shifts.

Cultural damage:

- graffiti, dust by foot traffic, touching of site and allowing livestock to get into the sites.

The Ouzman report (September 2009) also expresses concerns about:
1. Dust from mining activities;
2. Rock Instability and the impact from blasting on the site; and
3. General visiting of the site by mining employees and subsequent damage.

To address the issues of dust and rock instability from blasting, the specialist studies covering blasting and air quality was extended to cover the possible impacts on the rock art site.

Noise and Vibration Specialist Study - dB Acoustics

The blasting specialist study concluded that, *The rock art, which is situated east of the proposed open mine pit no 3 is some 1 780m from the eastern side of the open cast mine. Vibration test carried out during an overburden and coal blasting at 700m and 500m respectively revealed that the vibration levels were 1.4mm/s and 0.75mm/s. The distance is more than double the measured distance and due to this distance the vibration level at the rock art will be less than .50mm/s which is the normal vibration levels that prevail in the vicinity of the mine study area, without any type of blasting or vibration sources.*

Proper blast design at the open cast pit, control over the blasting process and compliance to the blast design chart – Figure 2 - will ensure that there can be no damaged at any of the concerned areas such as the rock art site.

As there are no vibration limits for geologically cliffs the limit for poorly constructed buildings and/or historical buildings of 10mm/s will be enforced in this area to protect the rock art site. Should 50kg of explosives be detonated per round at a distance of 1 700m the peak particle velocity (PPV) in mm/s will be well below 3mm/s.

The over air pressure which is associated with blasting will have no affect as the distance and the topography of the area will reduce the air pressure substantially at the rock art site in that the sound pressure level at the site will only be 75.4dB, which is similar to a truck noise passing measuring site at 30m from the road."

The recommendation thus from the Noise and Vibration report is:

"*The distance between the rock art site and the side of pit 3 is in excess of 1 780m and the vibration level at this distance will be below 3.0mm/s which will not create destruction of the existing rock art. The recommended vibration level for poorly constructed historical sites and/or clay buildings is 10mm/s before any damage to the building may occur. Due to the lack of recommended vibration levels for such rock art sites the recommended vibration level of 10mm/s will be used as a baseline figure. The design of the blast will be done according to the blast design chart to ensure minimum impact on the sensitive sites*."

Air Quality and Dust Specialist Study - SDG Consulting

"The amended plan now has the nearest opencast activity in excess of 2km from the rock art site.
Settling dust is more of an issue for the rock art than floating dust. Settling dust typically has a diameter far larger than PM10 but PM10 is used as an easily modelled indicator of likely flow patterns (as explained earlier).
The modelling results indicate that the rock art area is unlikely to be heavily impacted. In support of this is the fact that, generally, the wind flow is easterly. i.e., the wind generally blows from the rock site, towards the mine. Cumulative impacts over the life of the mine could become a problem however. Thus, precautions against dust contamination should be taken."

Figure 13 - Rock art - animal depictions

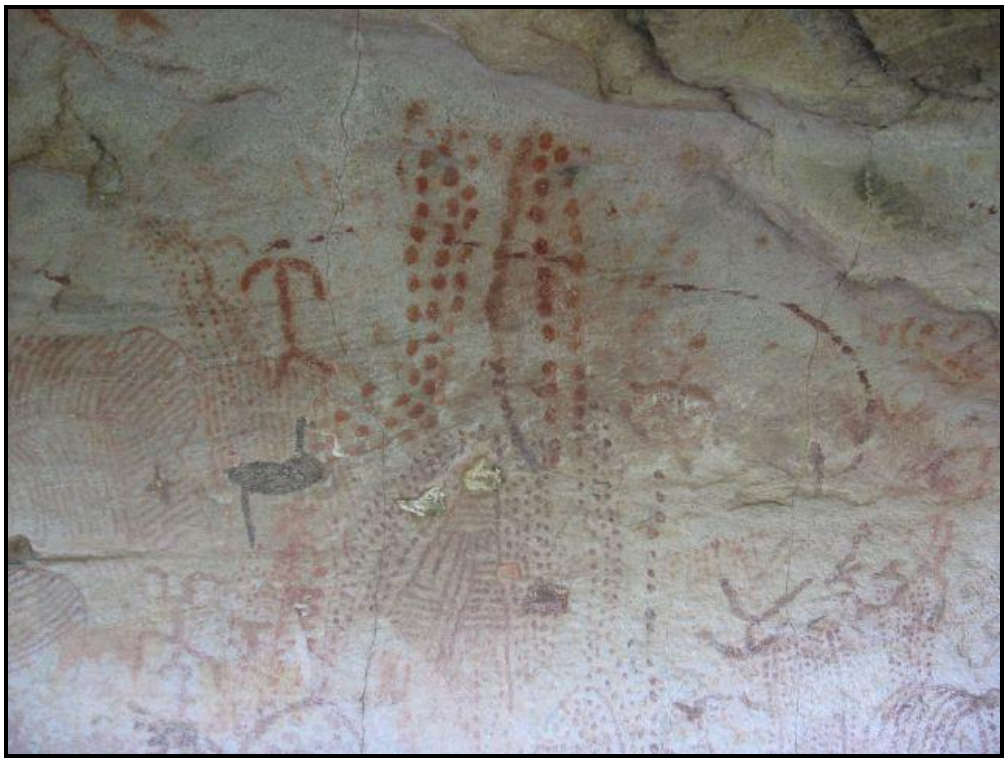


Figure 14 - Rock art - geometric patterns

Mitigation:

- Development of baseline data and followed up with quarterly and then annual monitoring of status of rock art site during mining.

- Development of management plan to regulate monitoring and base line data and propose possible actions if any mitigation is envisaged.

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
NS Grade 1	D	4	4	2	4	Medium
Establish baseline data and monitoring on quarterly and annual basis Management Plan for possible impacts		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		4	4	2	2	Low

6.10 Site 10

Coordinates: 26,26152 S 29,76549 E

Three informal graves were identified at this location. The graves were situated right next to a potato field and were placed next to each other. The dressings consisted originally of informal, elongated mounds of rock which were orientated from east to west. These dressings were disturbed/damaged most probably by the nearby agricultural activities.

Site size: Approximately 5m x 10m

Figure 15 - View of cemetery

Heritage Evaluation		Environmental Significance before Mitigation				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		Environmental Significance after Mitigation				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.11 Site 11

Coordinates: 26,25815 S 29,76616 E

Two informal graves were identified at this location. The graves were situated right next to a potato field and were placed next to each other. The dressings consisted originally of informal, elongated mounds of rock which were orientated from east to west. These dressings were disturbed/damaged most probably by the nearby agricultural activities.

Site size: Approximately 5m x 8m

Figure 16 - View of overgrown graves

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.12 Site 12

Coordinates: 26,24936 S 29,76909 E

A small informal cemetery with approximately 10-15 graves were identified here. The graves were situated in an open field and were placed in three lines next to each other. The graves were orientated from east to west and one of the graves had a cement inscribed headstone (illegible), but the rest of the graves had informal stone packed dressings. The graves were overgrown with grass.

Site size: Approximately 10m x 30m.

Figure 17 - View o cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.13 Site 13

Coordinates: 26,23242 S 29,78129 E

An old farm house with its relevant outbuildings was identified at this location. The house with the outbuildings was restored, maintained and occupied by the current owner. According to the owner the original house was approximately 150 years old.

Site size: Approximately 100m x 100m.

Figure 18 - View of main house of farmstead

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.B	C	6	4	1	4	Med
Establish baseline data and monitoring on bi-annual and annual basis		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		4	4	1	3	Low

Mitigation: The mining plan indicates the opencast activity in the area of the site. If the mining impact will be direct and the destruction of the site will be required a destruction permit under Section 34 of the NHRA will be required. This permit will only be granted after the site has been documented in its entirety by layout sketches of each structure and the farmstead layout, photographic documentation and historical background of the farmstead.

It is further recommended that a background history and oral history of the farmstead be completed with the documentation of the site.

6.14 Site 14

Coordinates: 26,23241 S 29,78313 E

A small fenced, formal, family cemetery with five graves was identified here. The graves were orientated from east to west and had formal cement and granite dressings and headstones. The cemetery belonged to the Grobler family.

Site size: Approximately 10m x 20m

Figure 19 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	5	5	1	6	High
Relocate with full social consultation and legal compliance		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	5	1	2	Low

Mitigation: The mining plan indicates opencast mining activity in this area. It is recommended that the graves be relocated after a full grave relocation process that includes comprehensive social consultation and legal compliance.

Alternatively the opencast boundary should be moved to facilitate the placement of an earth berm between the cemetery and the opencast area, as part of the conservation of the cemetery.

6.15 Site 15

Coordinates: 26,22949 S 29,78559 E

A small fenced informal cemetery with approximately 70 graves was identified here. The cemetery was situated right next to a small dam. The graves were placed in lines and most of them were orientated from east to west, but some were orientated from north to south. Most of the graves had informal stone packed dressings, but some of the graves had formal cement and granite dressings. The graves were overgrown with grass and weeds.

Site size: Approximately 50m x 60m

Figure 20 - View of grave in cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.16 Site 16

Coordinates: 26,28270 S 29,80153 E

A small informal cemetery with approximately 20 graves was identified at this location. The graves were situated in an open field and were placed in two lines. They were orientated from east to west and all had informal stone packed dressings. The graves were overgrown with grass.

Site size: Approximately 15m x 30m

Figure 21 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.17 Site 17

Coordinates: 26,28751 S 29,79446 E

Two graves within a fenced area were identified at this location. The graves were orientated from east to west and were overgrown with grass.

Site size: Approximately 3m x 4m

Figure 22 - View of overgrown graves

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.18 Site 18

Coordinates: 26,28025 S 29,78657 E

A small informal cemetery with approximately 50 graves was identified here. The cemetery was set next to a ploughed and planted maize field. The graves were placed in lines next to each other and were orientated from east to west. Some of the dressings of the graves were disturbed which accounted for the uncertainty regarding the number of graves at this location. Most of the graves had informal rock dressings, but a few had cemented and inscribed headstones. The graves were overgrown with grass.

Site size: Approximately 50m x 50m.

Figure 23 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.19 Site 19

Coordinates: 26,27442 S 29,78607 E

A small informal cemetery with an unknown amount of graves was identified here. The cemetery was situated within ploughed and planted maize fields and some of the graves were probably damaged due to the agricultural activities. The graves were all orientated from east to west and some of them had formal cement and granite dressings and the rest had informal stone packed dressings. The graves were overgrown with grass which also accounted for the uncertain number of graves.

Site size: Approximately 30m x 30m.

Figure 24 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	5	5	1	6	High
Relocate with full social consultation and legal compliance		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	5	1	2	Low

Mitigation: The mining plan indicates the proposed position of the mining plant in this area. Mitigation of this site will require a fence around the cemetery with a buffer of at least 20 meters.
It will be possible to demarcate the site within the plant area or adjust the plant boundary to exclude the site form the plant footprint.

6.20 Site 20

Coordinates: 26,27640 S 29,78330 E

Five informal graves were identified at this location. The graves were placed in a line next to each other in an open grass field. The graves were orientated from east to west and all had informal stone packed dressings. One grave had a metal inscribed box placed over it. The graves were all overgrown with grass.

Site size: Approximately 5m x 20m

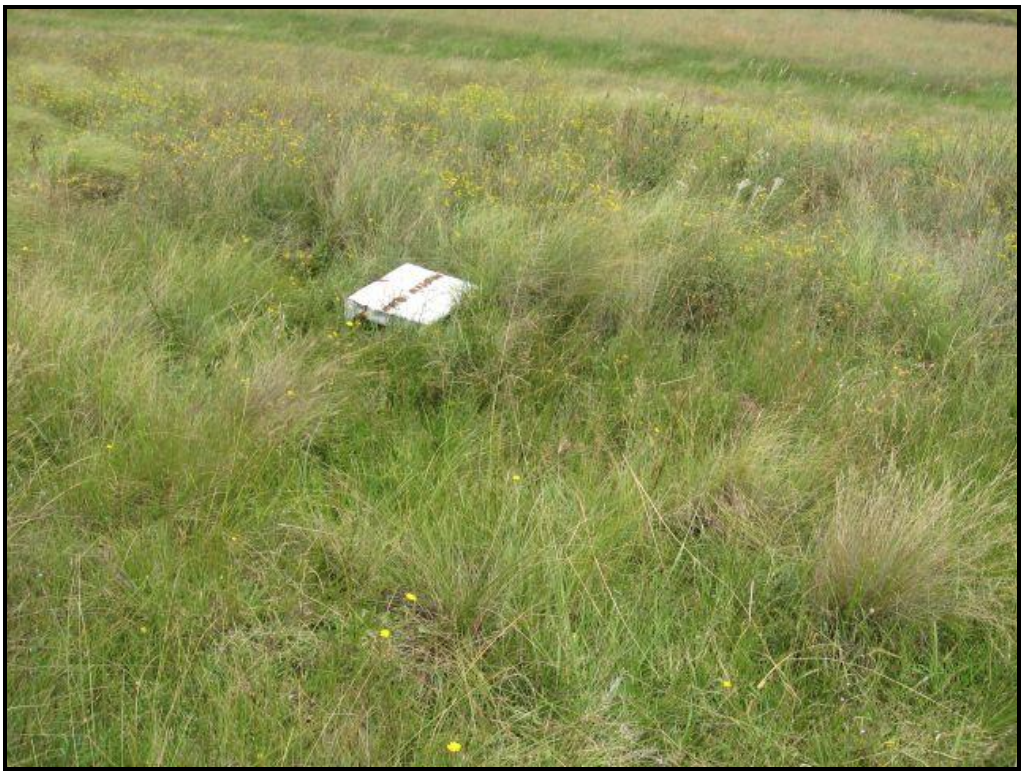


Figure 25 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.21 Site 21

Coordinates: 26,27129 S 29,77950 E

Five informal graves were identified at this location. The graves were placed in a line next to each other in an open grass field. The graves were orientated from east to west and all had informal stone packed dressings, except for one grave which had a more formal rectangular cement dressing and a headstone. The graves were all overgrown with grass.

Site size: Approximately 5m x 20m

Figure 26 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.22 Site 22

Coordinates: 26,26128 S 29,78682 E

A small formal family cemetery with 12 graves was identified at this location. The graves were placed in two lines next to each other and were situated in a fenced and isolated area approximately 250m from the farm house. The graves were all orientated from east to west and all had formal cement and granite dressings and headstones.

Site size: Approximately 30m x 30m

Figure 27 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.23 Site 23

Coordinates: 26,26164 S 29,78630 E

The dilapidated remains of an old farm house and its outbuildings were identified here. Some of the buildings or rooms were still being occupied, but most of them were in a neglected state. The mining plan indicates the planned process plant as to the east of the site.

Site size: Approximately 100m x 100m

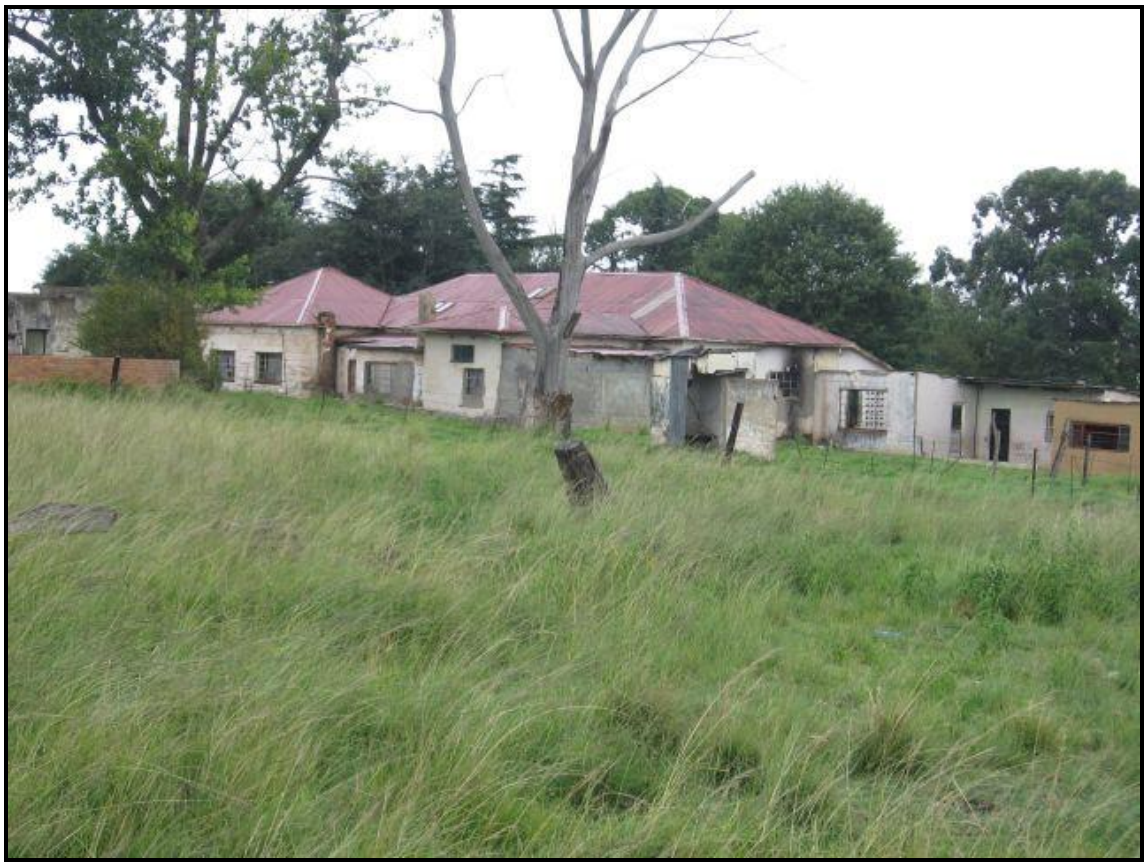


Figure 28 - View of farmhouse

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.B	C	6	4	1	4	Med
Establish baseline data and monitoring on bi-annual and annual basis		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		4	4	1	3	Low

Mitigation: Establish baseline data and monitoring on bi-annual and annual basis

6.24 Site 24

Coordinates: 26,26764 S 29,78395 E

A single informal grave was identified at this location. The grave was situated in an open grass field and was orientated from east to west. The grave had an informal stone packed dressing and was overgrown with grass. The mining plan indicates the planned process plant as to the east of the site.

Site size: Approximately 2m x 3m.

Figure 29 - View of grave

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.25 Site 25

Coordinates: 26,28614 S 29,79739 E

Two formal graves within a cattle camp were identified at this location. The graves were orientated from east to west and had formal cement and granite dressings with inscribed headstones. These dressings were slightly damaged, probably due to their location within a cattle camp.

Site size: Approximately 4m x 5m.

Figure 30 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.26 Site 26

Coordinates: 26,26366 S 29,76208 E

A small fenced informal cemetery with approximately 40 graves was identified here. The graves were placed in several lines and were orientated from east to west. One of the graves had a formal cement and granite dressing and the other graves had informal stone packed dressings. Most of the graves were overgrown with grass, but some of the graves were recently treated with pesticides to clear them.

Site size: Approximately 30m x 30m

Figure 31 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.27 Site 27

Coordinates: 26,20749 S 29,77579 E

Two informal graves were identified at this location. The graves were placed next to each other and were situated inside a small orchard. The graves were orientated from east to west and had informal stone packed dressings. The graves were also overgrown with grass.

Site size: Approximately 3m x 6m

Figure 32 - View of overgrown cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.28 Site 28

Coordinates: 26,20755 S 29,77697 E

An old farm house with its relevant outbuildings was identified at this location. The house with the outbuildings was restored, maintained and occupied by the current owner. According to the owner the original house was approximately 100 years old. A brick/stone above the main door with a date of 1907 confirmed this.

Site size: Approximately 100m x 100m.

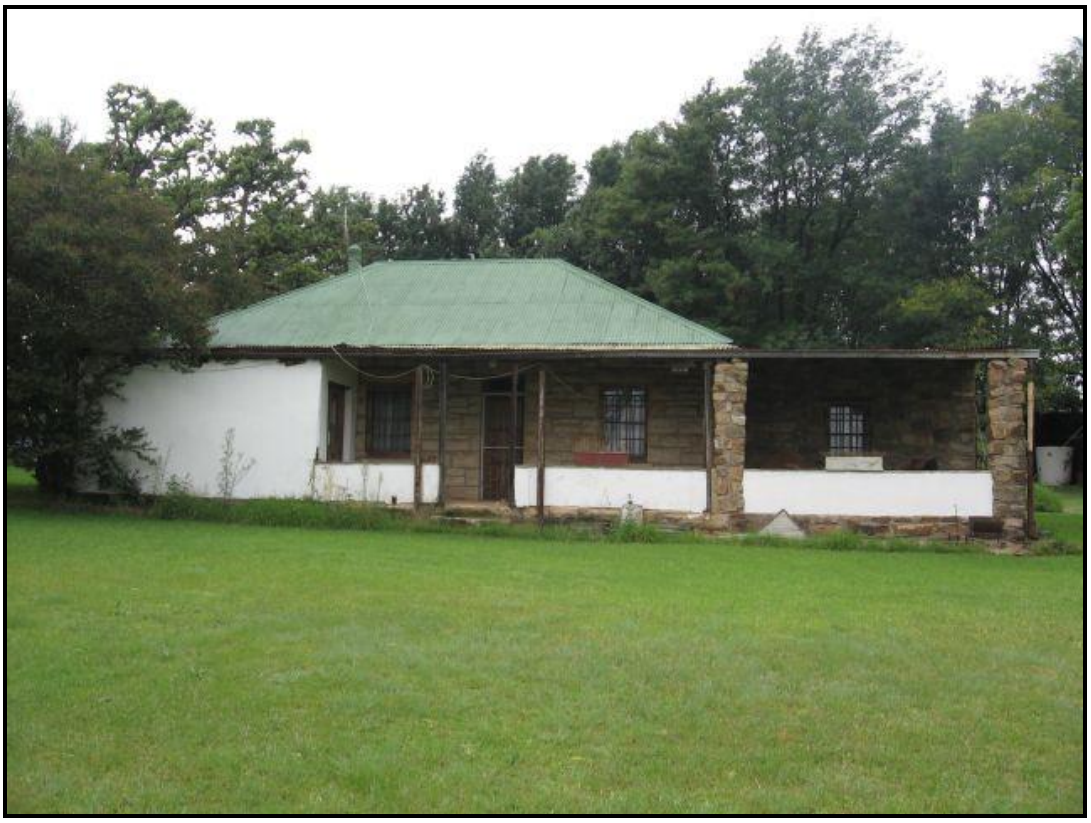


Figure 33 - View of main house on farmstead

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.B	C	6	4	1	4	Med
Establish baseline data and monitoring on bi-annual and annual basis		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		4	4	1	3	Low

Mitigation: Establish baseline data and monitoring on bi-annual and annual basis

6.29 Site 29

Coordinates: 26,20886 S 29,77697 E

A small informal cemetery with approximately eight graves was identified at this location. The cemetery was enclosed with a square stone wall which measured approximately 1,2m high and 1m wide. The graves were orientated from east to west and had informal stone packed dressings. Some of the graves had inscribed cement headstones. The graves and the whole cemetery were overgrown with Black Wattle trees. The cemetery and the graves were most probably of European origin.

Site size: Approximately 20m x 20m.

Figure 34 - View of overgrown cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.30 Site 30

Coordinates: 26,21177 S 29,77498 E

Two informal graves were identified at this location. The graves were situated next to each other in an open grass field. The graves were orientated from east to west and had informal stone packed dressings. They were overgrown with grass.

Site size: Approximately 3m x 6m.

Figure 35 - View of overgrown cemetery

Heritage Evaluation		Environmental Significance before Mitigation				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.31 Site 31

Coordinates: 26,22057 S 29,77411 E

Four informal graves were identified at this location. The graves were situated next to the homestead of the related family. The graves were placed next to each other and were orientated from east to west. The graves had no dressings, but were indicated with cemented headstones. The graves were overgrown with grass.

Site size: Approximately 5m x 10m

Figure 36 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.32 Site 32

Coordinates: 26,22170 S 29,77583 E

A small informal, fenced cemetery with approximately 20 graves was identified here. The cemetery was situated in an open grass field and the graves were placed in lines next to each other. The graves were orientated from east to west and three of them had cemented dressings and headstones. The rest of the graves had informal stone packed dressings. The graves were overgrown with grass.

Site size: Approximately 20m x 20m

Figure 37 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.33 Site 33

Coordinates: 26,21880 S 29,77839 E

The abandoned and dilapidated remains of an old farm house and its outbuildings were identified here.

Site size: Approximately 100m x 100m

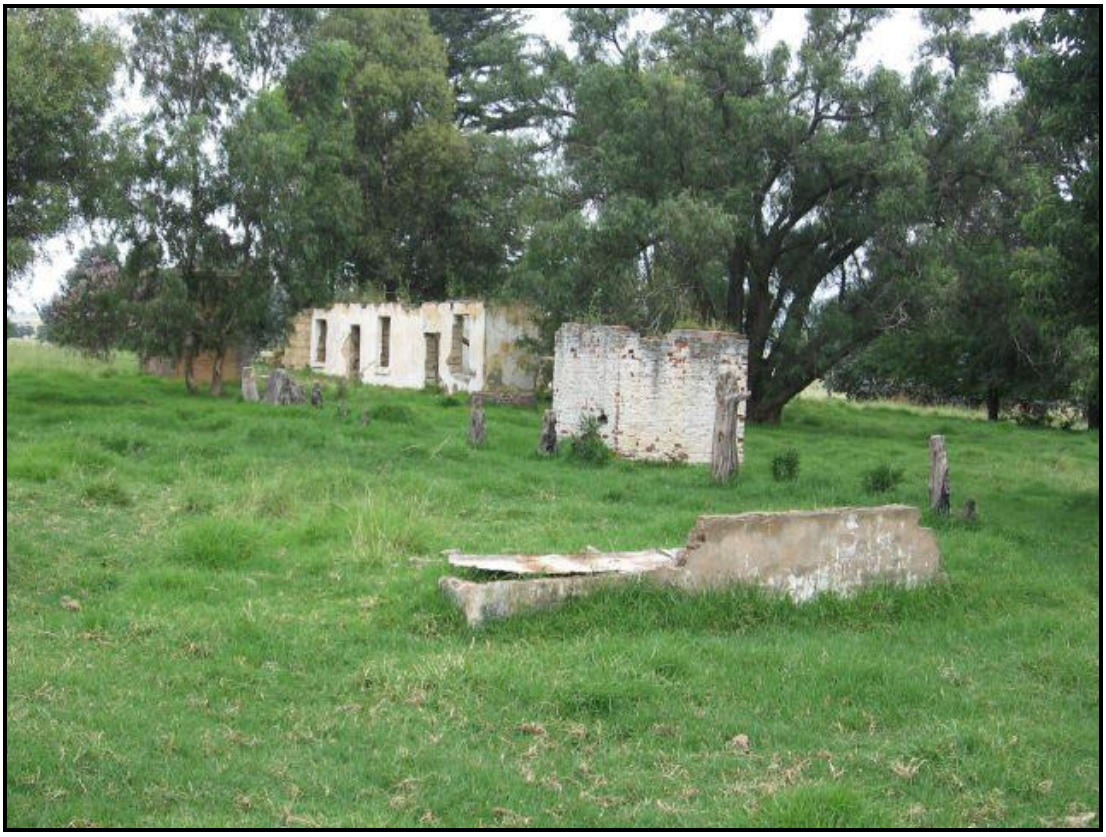


Figure 38 - View of farmstead remains

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.B	C	6	4	1	4	Med
Establish baseline data and monitoring on bi-annual and annual basis		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		4	4	1	3	Low

Mitigation: Establish baseline data and monitoring on bi-annual and annual basis

6.34 Site 34

Coordinates: 26,27299 S 29,75714 E

A small informal cemetery with approximately 10 graves was identified at this location. The graves were set amongst a Blue Gum tree plantation and were placed in two lines next to each other. The graves were orientated from east to west and had informal stone packed dressings. The graves were overgrown with grass.

Site size: Approximately 10m x 20m.

Figure 39 - View of overgrown cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.35 Site 35

Coordinates: 29.7842 S 26.2252 E

A single grave was identified at this location. The grave was set amongst a ploughed maize field. The grave was orientated from east to west and had informal stone packed dressings. The grave was overgrown with grass.

Site size: Approximately 10m x 10m.

Figure 40 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

6.36 Site 36

Coordinates: 29.7556S 26.2717E

Three graves were identified at this location. The graves were set amongst a wattle trees. The graves were orientated from east to west and had informal stone packed dressings. The graves were overgrown with grass.

Site size: Approximately 10m x 10m.

Figure 41 - View of cemetery

Heritage Evaluation		**Environmental Significance before Mitigation**				
Heritage Significance	**Mitigation**	**Magnitude**	**Duration**	**Scale**	**Probability**	**SP**
GP.A	D	2	4	1	2	Low
No mitigation		**Environmental Significance after Mitigation**				
		Magnitude	**Duration**	**Scale**	**Probability**	**SP**
		2	2	1	2	Low

Mitigation: Currently no mitigation will be required as the mine plan does not foresee any mining in the area of the site.

7. ASSUMPTIONS AND LIMITATIONS

Not subtracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and the current dense vegetation cover. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted. Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist had been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. In the foregoing discussion the long history of occupation of the region by black farmer communities has also been pointed out. In the event that any graves or burial places are located during the development the procedures and requirements pertaining to graves and burials will apply as set out below.

Prevailing vegetation growth in the study area made identification of heritage resources difficult due to restricted visibility.

8. LEGAL AND POLICY REQUIREMENTS

8.1 General principles

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

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

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

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

According to the National Heritage Act (Act 25 of 1999 section 32) it is stated that:

An object or collection of objects, or a type of object or a list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including –

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

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

8.1 Graves and cemeteries

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

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

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

9. ASSESSMENT AND RECOMMENDATIONS

*A heritage map is provided in **Annexure A***

During the survey 36 sites of heritage significance were identified.

The heritage sites consist of 29 cemeteries with a total of approximately 352 graves, 6 farmsteads and one rock arts site. The rock art site is located within a kilometre radius from the eastern most boundary of the study area and 1.9kilometres from the closest mining activity.

The following mitigations measures are recommended for the heritage site identified where they are to be impacted by the mining project.

Graves and Cemeteries

Mitigation of these sites will require a fence around the cemetery with a buffer of at least 20 meters. The mining impact will have a direct impact on **Sites 14 and 19** and it is recommended that the graves be relocated after a full grave relocation process that includes comprehensive social consultation. The grave relocation process must include:

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

Alternatively the mining boundaries can be adjusted to demarcate the positions of the two cemeteries or exclude the cemeteries where possible.

Houses and Farmsteads

The mining impact will be direct on Site 13 and the destruction of the site will be required a destruction permit under Section 34 of the NHRA will be required. This permit will only be granted after the site has been documented in its entirety by layout sketches of each structure and the farmstead layout, photographic documentation and historical background of the farmstead. Further to this it is recommended that a full background research on the history of the farmstead and oral history be done together with the documentation of the physical structures.

Rock Art site

The impact evaluation from blasting on the site has determined that, "*The distance between the rock art site and the side of pit 3 is in excess of 1 780m and the vibration level at this distance will be below 3.0mm/s which will not create destruction of the existing rock art. The recommended vibration level for poorly constructed historical sites and/or clay buildings is 10mm/s before any damage to the building may occur. Due to the lack of recommended vibration levels for such rock art sites the recommended vibration level of 10mm/s will be used as a baseline figure. The design of the blast will be done according to the blast design chart to ensure minimum impact on the sensitive sites*."

Further evaluation of the possible impact by dust from the mining project has concluded that:

"The amended plan now has the nearest opencast activity in excess of 2km from the rock art site.
Settling dust is more of an issue for the rock art than floating dust. Settling dust typically has a diameter far larger than PM10 but PM10 is used as an easily modelled indicator of likely flow patterns (as explained earlier).
The modelling results indicate that the rock art area is unlikely to be heavily impacted. In support of this is the fact that, generally, the wind flow is easterly. i.e., the wind generally blows from the rock site, towards the mine. Cumulative impacts over the life of the mine could become a problem however. Thus, precautions against dust contamination should be taken."

Although the site is not directly in the proposed project area, it is within a 1.9 kilometer from the closest open cast area, monitoring of the site on a quarterly and annual basis to assess the possible impact of the mining activities on the site. Such a management/monitoring program needs to be incorporated into the current research program on the site. The monitoring programme needs to be developed in conjunction with the research institute, dust pollution experts and the mining company. It will require the establishment of baseline data of pre-mining conditions, construction conditions, and operational conditions to facilitate the

The following general mitigation measures are recommended:

- A Monitoring plan or watching brief must be agreed upon by all the stakeholders for the different phases of the project. The developer undertakes to give the archaeologist sufficient time to identify and record and archaeological finds and features.
- If during construction any possible finds are made, the operations must be stopped and the qualified archaeologist be contacted for an assessment of the find.
- A heritage resources management plan must be developed for managing the heritage resources in the surface area impacted by mining operations during construction and operation of the development. This includes basic training for construction staff on possible finds, action steps for mitigation measures, surface collections, excavations, and communication routes to follow in the case of a discovery.

10. MANAGEMENT GUIDELINES AND PROCEDURES

10.1 Management Guidelines

1. The National Heritage Resources Act (Act 25 of 1999) states that, any person who intends to undertake a development categorised as-

(a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
(b) the construction of a bridge or similar structure exceeding 50m in length;
(c) any development or other activity which will change the character of a site-
    (i) exceeding 5 000 m^2 in extent; or
    (ii) involving three or more existing erven or subdivisions thereof; or
    (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
    (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or
(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, 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 development.

In the event that an area previously not included in an archaeological or cultural resources survey, is to be disturbed, the South African Heritage Resources Agency (SAHRA) needs to be contacted. An enquiry must be lodged with them into the necessity for a Heritage Impact Assessment.

2. In the event that a further heritage assessment is required it is advisable to utilise a qualified heritage practitioner preferably registered with the Cultural Resources Management Section (CRM) of the Association of Southern African Professional Archaeologists (ASAPA).
   This survey and evaluation must include:
   (a) The identification and mapping of all heritage resources in the area affected;
   (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7 of the National Cultural Resources Act;
   (c) an assessment of the impact of the development on such heritage resources;
   (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
   (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
   (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
   (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.
3. It is advisable that an information section on cultural resources be included in the SHEQ training given to contractors involved in surface earthmoving activities. These sections must include basic information on:
   a. Heritage;
   b. Graves;
   c. Archaeological finds; and
   d. Historical Structures;
   This module must be tailor made to include all possible finds that could be expected in that area of construction.

4. In the event that a possible find is discovered during construction, all activities must be halted in the area of the discovery and a qualified archaeologist contacted.
5. The archaeologist needs to evaluate the finds on site and make recommendations towards possible mitigation measures.
6. If mitigation is necessary, an application for a rescue permit must be lodged with SAHRA.
7. After mitigation an application must be lodged with SAHRA for a destruction permit. This application must be supported by the mitigation report generated during the rescue excavation. Only after the permit is issued may such a site be destroyed.
8. If during the initial survey sites of cultural significance is discovered, it will be necessary to develop a management plan for the preservation, documentation or destruction of such site. Such a program must include a *watching brief*, timeframe and agreed upon schedule of actions between the company and the archaeologist.
9. In the event that human remain are uncovered or previously unknown graves are discovered a qualified archaeologist needs to be contacted and an evaluation of the finds made.
10. If the remains are to be exhumed and relocated, the relocation procedures as accepted by SAHRA needs to followed. This includes an extensive social consultation process.

The definition of an archaeological watching brief is a formal program of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.

The purpose of a watching brief is:

- To allow, within the resources available, the preservation by record of archaeological deposits, the presence and nature of which could not be established (or established with sufficient accuracy) in advance of development or other potentially disruptive works
- To provide an opportunity, if needed, for the watching archaeologist to signal to all interested parties, before the destruction of the material in question, that an archaeological find has been made for which the resources allocated to the watching brief itself are not sufficient to support treatment to a satisfactory and proper standard.
- A watching brief is not intended to reduce the requirement for excavation or preservation of known or inferred deposits, and it is intended to guide, not replace, any requirement for contingent excavation or preservation of possible deposits.
- The objective of a watching brief is to establish and make available information about the archaeological resource existing on a site.

Professional Grave Solutions – Heritage Unit can be contacted on the way forward in this regard.

10.2 Roles and responsibilities

ROLE	RESPONSIBILITY	IMPLEMENTATION
A responsible specialist needs to be allocated and should sit in at all relevant meetings, especially when changes in design are discussed, and liaise with SAHRA	The client	Archaeologist and a competent archaeology supportive team
If chance finds and/or graves or burial	The client	Archaeologist and a

grounds are identified during construction or operational phases, a specialist must be contacted in due course for evaluation.		competent archaeology supportive team
Comply with defined national and local cultural heritage regulations on management plans for identified sites;	The client	Environmental Consultancy and the Archaeologist
Consult the managers, local communities and other key stakeholders on mitigation of archaeological sites;	The client	Environmental Consultancy and the Archaeologist
Implement additional programs, as appropriate, to promote the safeguarding of our cultural heritage. (i.e. integrate the archaeological components into employee induction course)	The client	Environmental Consultancy and the Archaeologist,
If required, conservation or relocation of burial grounds and/or graves according to the applicable regulations and legislation	The client	Archaeologist, and/or competent authority for relocation services
Ensure that recommendations made in the Heritage Report are adhered by	The client	The client
Provision of services and activities related to the management and monitoring of significant archaeological sites	The client	Environmental Consultancy and the Archaeologist
After the specialist/archaeologist has been appointed, comprehensive feedback reports should be submitted to relevant authorities during each phase of development.	Client and Archaeologist	Archaeologist

Table 2: Roles and responsibilities of archaeological and heritage management

11. Impact Management

11.1.1 Pre-construction phase

Based on the findings of the Heritage Report, all stakeholders and key personnel should undergo an archaeological induction course during this phase. Induction courses generally form part of the employees' (miners') overall training and the archaeological component can easily be integrated into these training sessions. Two courses should be organised – one aimed more at managers and supervisors, highlighting the value of this exercise and the appropriate communication channels that should be followed after chance finds, and the second targeting the actual workers and getting them to recognize artefacts, features and significant sites. This needs to be supervised by a qualified archaeologist. This course should be reinforced by posters reminding operators of the possibility of finding archaeological sites.

11.1.2 Construction phase

The project will encompass a range of activities during the construction phase, including ground clearance, establishment of mining area and small scale infrastructure development associated with the opencast mining area, such as ablution facilities or small offices. Construction activities related to the mine encompass the total destruction of the land surface and subsequent to that, all cultural and natural relics located in the directly affected area will be lost.

It is possible that cultural material will be exposed during operations and feasibly may be recoverable, but this is the high-cost front of the operation, and so any delays should be minimised. Development surrounding infrastructure and construction of facilities result in significant disturbance, but construction trenches do offer a window into the past and it may be possible to rescue some of these data and materials. It is also possible that substantial alterations are implemented during this phase of the project and these must be catered for. Temporary infrastructure are often changed or added to the subsequent history of the project. In general these are low impact developments as they are superficial, resulting in little alteration of the land surface, but still need to be catered for.

During the construction phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. A responsible archaeologist must be appointed for this commission. This person does not have to be a permanent employee, but needs to sit in at relevant meetings, for example when changes in design are discussed, and notify SAHRA of these changes.

The archaeologist would inspect the site and any development recurrently, with more frequent visits to the actual workface and operational areas. In addition, feedback reports can be submitted by the archaeologist to the client and SAHRA to ensure effective monitoring. This archaeological monitoring and feedback strategy should be incorporated into the Environmental Management Plan (EMP) of the mine. Should an archaeological site or cultural material be discovered during construction (or operation), such as burials or grave sites, the project needs to be able to call on a qualified expert to make an expert decision on what is required and if necessary to carry out emergency recovery. SAHRA would need to be informed and may give advice on procedure. The developers therefore should have some sort of contingency plans so that operations could move temporarily elsewhere while the material and data are recovered. The project thus needs to have an archaeologist available to do such work.

The purpose of an archaeological monitoring programme is to provide general information to the developer with regards to management recommendations and cost estimates for the archaeological component, a specialist sub-section of the Environmental Impact Assessment (EIA) process, for the project.

Such a monitoring programme is planned for observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land where there is a possibility that archaeological deposit may be disturbed or destroyed. Its main purpose is:

- To allow, within the resources available, the preservation by record of archaeological deposits, the presence and nature of which could not be established (or established with sufficient accuracy) in advance of development or other potentially disruptive works
- To provide an opportunity, if needed, for the monitoring archaeologist to signal to all interested parties, before the destruction of the material in question, that an archaeological find has been made for which the resources allocated to the monitoring programme itself are not sufficient to support treatment to a satisfactory and proper standard.
- A monitoring programme is not intended to reduce the requirement for excavation or preservation of known or inferred deposits, and it is intended to guide, not replace, any requirement for contingent excavation or preservation of possible deposits.

In essence, the objective of a monitoring programme is to establish and make available information about the archaeological resource existing on a site.

11.1.3 Operational phase

Once the mining project is up and running, the urgency to identify, document and assess archaeological and heritage resources in the opencast area declines, but does not cease. Undocumented sites are still protected by law as no permit would have been issued for their destruction. Apart from any significant changes in operation design, which call for the inclusion of an archaeologist in decision making and notification of SAHRA, there is the accumulated impact of a project on the land surface, and this could result in erosion exposing further sites. Periodic monitoring by an archaeologist and awareness promotion therefore remain tasks. The client and the archaeologist would need to draw up a schedule for this.

11.1.4 Decommissioning and closure phase

During the decommissioning and closure phase of the project, no new areas are expected to be disturbed and/or impacted. Subsequently, no additional sites of archaeological and heritage significance are expected to be impacted on during decommissioning. Furthermore, the majority of sites of archaeological and heritage significance (cultural and natural) would have been recorded and/or assessed in preceding phases. During the decommissioning and closure phase, it may be recommended that the appointed archaeologist review management procedures and ensure that effective measures were implemented. A comprehensive feedback report should be submitted by the archaeologist to the client, and SAHRA.

12. LIST OF PREPARES

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John Anderson

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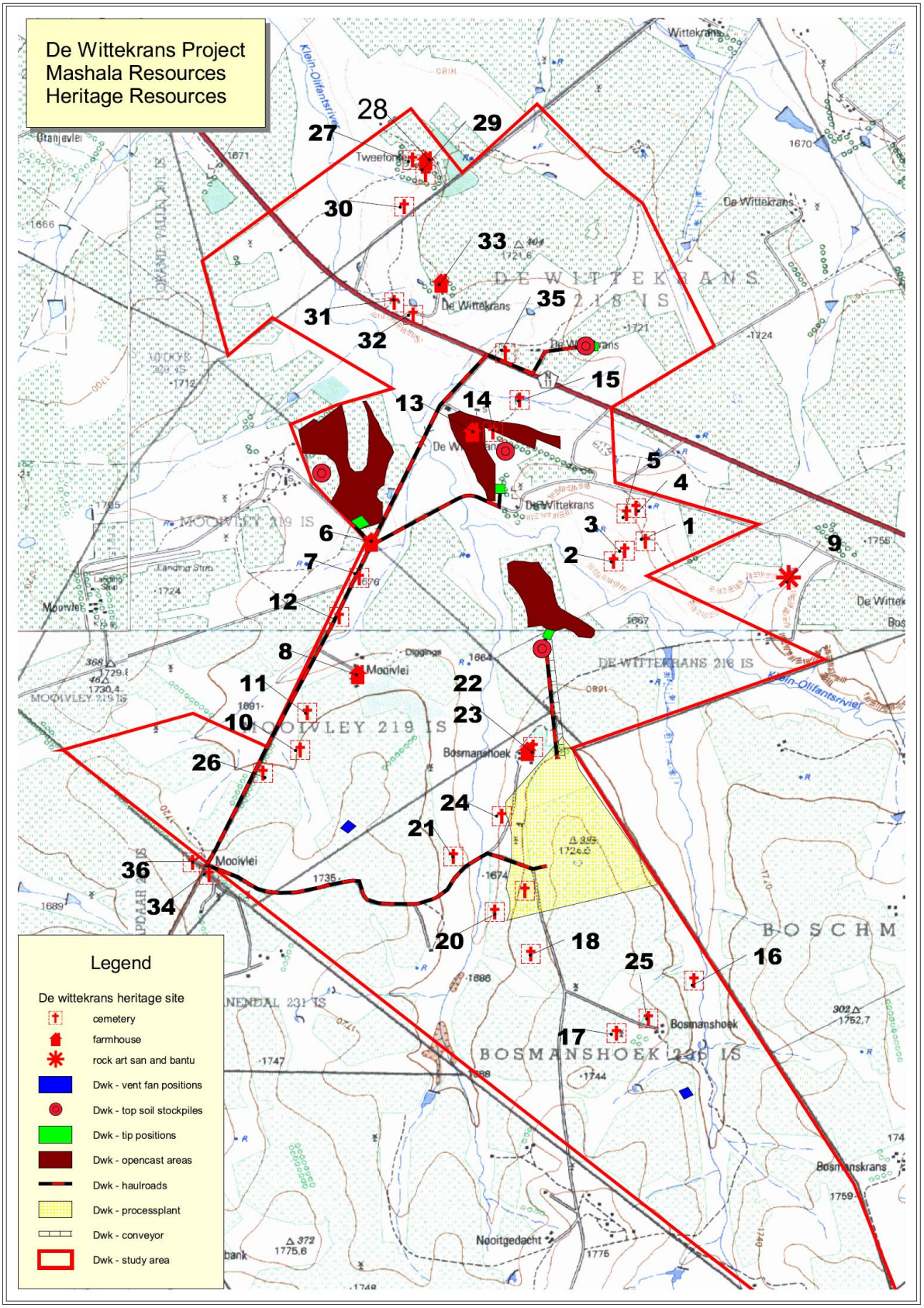
ANNEXURE A:
Heritage Sites


De Wittekrans Project
Mashala Resources
Heritage Resources
Legend
De wittekrans heritage site
cemetery
farmhouse
rock art san and bantu
Dwk - vent fan positions
Dwk - top soil stockpiles
Dwk - tip positions
Dwk - opencast areas
Dwk - haulroads
Dwk - processplant
Dwk - conveyor
Dwk - study area
Mooivlei
Bosmanshoek
Nooitgedacht
De Wittekrans
DE WITTEKRANS 218 IS
MOOIVLEY 219 IS
BOSMANSHOEK 248 IS
Klein-Olifantsrivier