

Phase 1 Cultural Heritage Impact Assessment:

**PROPOSED “TGME MINE DEVELOPMENT PROJECT (10167)” : GOLD MINING
PROJECTS IN TERMS OF PRE-MINED RESIDUE AND HARD ROCK MINING,
PILGRIM’S REST REGION, MPUMALANGA PROVINCE**

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Declaration:

I, J.A. van Schalkwyk, declare that:

- I am suitably qualified and accredited to act as independent specialist in this application.
- I do not have any financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services, for which a fair remuneration is charged.
- The work was conducted in an objective manner and any circumstances that might have compromised this have been reported.



J A van Schalkwyk
Heritage Consultant
September 2017



EXECUTIVE SUMMARY**Phase 1 Cultural Heritage Impact Assessment:
PROPOSED "TGME MINE DEVELOPMENT PROJECT (10167)": GOLD
MINING PROJECTS IN TERMS OF PRE-MINED RESIDUE AND HARD ROCK
MINING, PILGRIM'S REST REGION, MPUMALANGA PROVINCE**

Transvaal Gold Mining Estates Limited (TGME), Mpumalanga Province, is applying to rework Pre-Mined Residue (PMR) mines in the Pilgrims Rest area, which will form part of a larger project named the TGME Mine Development project (Project 10167). Stonewall Mining(Pty) Limited (SWM) owns the company "Transvaal Gold Mining Estates Limited (TGME)" to which these Mining and also prospecting rights were granted and executed and registered.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *Globesight* to undertake a cultural heritage assessment to determine if the proposed development of the proposed mining activities would have an impact on any sites, features or objects of cultural heritage significance.

The cultural landscape qualities of the region essentially consist of two components. The first is made up of a limited pre-colonial (Stone Age and Iron Age) occupation. The second component is a rural area in which the human occupation consists of two elements. The discovery of gold during the late 19th century resulted in a flood of people entering the area, establishing gold mining activities all over the landscape. The second element is a rural farming community, which, since the early 20th century revolved around forestry, which altered the landscape beyond recognition. These two elements led to the establishment of a number of smaller towns in the region, all which are now part of an ongoing tourism industry.

Identified heritage sites and proposed mitigation measures

Heritage impacts are categorised as:

- Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries;
- Indirect impacts, e.g. restriction of access or visual intrusion concerning the broader environment;
- Cumulative impacts that are combinations of the above.

Impacts can be managed through one or a combination of the following measures:

- Mitigation
- Avoidance
- Compensation
- Enhancement (positive impacts)
- Rehabilitation
- Interpretation
- Memorialisation

For the current study, the following mitigation measures are proposed, to be implemented only if any of the identified sites or features are to be impacted on by the proposed mining activities:

Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

- (1) Avoidance: This is viewed to be the primary form of mitigation. The site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall). Depending on the type of site, the buffer zone can vary from
 - 5 metres for a single grave, to
 - 50 metres where the boundaries are less obvious, e.g. a Late Iron Age site.
- (2) Archaeological investigation: This option can be implemented with additional design and construction inputs. Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist.
 - This option should be implemented when it is impossible to avoid impacting on an identified site or feature.
 - This also applies for graves older than 60 years that are to be relocated. For graves younger than 60 years a permit from SAHRA is not required. However, all other legal requirements has to be adhered to.
 - Impacts can be beneficial – e.g. mitigation contribute to knowledge
- (3) Rehabilitation: When features, e.g. buildings or other structures, e.g. bridges, are to be re-used. Conservation measures would be to record the buildings/structures as they are (at a particular point in time). The records and recordings would then become the 'artefacts' to be preserved and managed as heritage features or (movable) objects.
 - It is recommended that detail plan drawings are made (if the originals cannot be located in the TGME archive) and that the current situation is photographed in detail.
 - This approach automatically also leads to the enhancement of the sites or features that are re-used.
- (4) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report.

Summary of Identified Heritage Resources in the Study Areas.

IDENTIFIED HERITAGE RESOURCES					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After	Proposed mitigation (Refer to definitions above)
Vaalhoek					
Vh 01	Mine structure	Section 34	High significance – Grade III-B	Medium (48) Low (24)	(2) Document site / (3) Rehabilitate buildings for re-use
Vh 02	Mine structure	Section 34	Medium significance – Grade IV-B	Medium (48) Low (24)	(2) Document site
Vh 03	Grave	Section 36	Medium significance – Grade IV-A	Low (20) Low (20)	(1) Avoid
Willemsoord					
Wo 01	Homestead	Section 34	Medium significance – Grade IV-B	Medium (48) Low (20)	(1) Avoid / (2) excavate archaeologically
Wo 01	Power line	Section 34	High significance – Grade III-B	Low (20) Low (20)	(1) Avoid
Willemsoord West					
WoW 01	Farmstead	Section 34	Medium significance – Grade IV-C	Low (20) Low (20)	(1) Avoid / (2) excavate archaeologically

WoW 02	Iron Age settlement	Section 35	High significance – Grade III-B	Low (20)	(1) Avoid / (2) excavate archaeologically
				Low (20)	

Bourke's Luck					
BL 01	Adit	Section 34	Low significance – Grade IV-C	Medium (48)	(4) Considered documented in full
				Low (20)	
BL 02a	Homestead	Section 34	High significance – Grade III-B	Medium (48)	(1) Avoid / (2) excavate archaeologically
				Low (20)	
BL 02b	Burial site	Section 36	Medium significance – Grade IV-C	Medium (48)	(1) Avoid / (2) excavate archaeologically
				Low (20)	
BL 03	Burial site	Section 36	High significance – Grade III-B	Low (20)	(1) Avoid / (2) excavate archaeologically
				Low (20)	
BL 04	Power line	Section 34	High significance – Grade III-B	Low (20)	(1) Avoid / (2) excavate archaeologically
				Low (20)	
BL 05	Built structure	Section 35	High significance – Grade III-B	Medium (48)	(1) Avoid / (2) excavate archaeologically
				Low (20)	

Buffelsfontein					
Bu 05	Adit	Section 34	Low significance – Grade IV-C	Medium (48)	(4) Considered documented in full
				Low (20)	

Desire					
DS 01	Adit	Section 34	Low significance – Grade IV-C	Medium (48)	(4) Considered documented in full
				Low (20)	

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view it is recommended that the proposed development be allowed to continue on acceptance of the proposed mitigation measures.

Conditions for inclusion in the environmental authorisation:

- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- Copies of all mitigation work done as a result of this or other developments undertaken by Stonewall Mining (TGME), should be incorporated into the central TGME archive for safekeeping.



J A van Schalkwyk
Heritage Consultant
September 2017

TECHNICAL SUMMARY

Project description	
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Description	Development of gold mining activities
Project name	TGME Mine Development Project (10167)

Applicant	
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Stonewall Mining: Transvaal Gold Mining Estates (TGME)	
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Property details	
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Province	Mpumalanga
Magisterial district	Pilgrims Rest 2
Local municipality	Thaba Chweu
Topo-cadastral map	2430DA, 2430DB, 2430DD
Farm name	Buffelsfontein 452KT; Granite Hill 477KT; Sacramento Creek 492KT; Rotunda Creek 510KT; Doornhoek 545KT; Breytenbachskraal 556KT; Desire 563KT; Hermansberg 495KT; Klondyke 493KT; Manx 475KT; Vaalhoek 474KT; Willemsoord 476KT; Black Hill 528KT
Closest town	Graskop

Environmental assessors	
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Globesight	
Mr F Pieterse	

Public participation process	
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Batho Earth	
Ms D Verster	

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Later Stone Age	30 000 - until c. AD 200

Iron Age: Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. As they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Later Iron Age	AD 1300 - AD 1830

Historical Period: Since the arrival of the white settlers - c. AD 1840 - in this part of the country.

Cumulative impacts: "Cumulative Impact", in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Mitigation, means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

ABBREVIATIONS

ADRC	Archaeological Data Recording Centre
ASAPA	Association of Southern African Professional Archaeologists
CS-G	Chief Surveyor-General
EIA	Early Iron Age
ESA	Early Stone Age
LIA	Late Iron Age
LSA	Later Stone Age
HIA	Heritage Impact Assessment
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

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1. INTRODUCTION

Transvaal Gold Mining Estates Limited (TGME), Mpumalanga Province, is applying to rework Pre-Mined Residue (PMR) mines in the Pilgrims Rest area, which will form part of a larger project named the TGME Mine Development project (Project 10167). Stonewall Mining(Pty) Limited (SWM) owns the company "Transvaal Gold Mining Estates Limited (TGME)" to which these Mining and also prospecting rights were granted and executed and registered.

The application for a Mining Right is an outcome of the prospecting completed over the past 8 years. TGME is applying for a Mining Right in order to mine, Zinc ore, Copper ore, Bismuth ore, Stone Aggregate (from Waste dump), Iron ore, Silver ore and Gold ore on the farms Buffelsfontein 452KT; Granite Hill 477KT; Sacramento Creek 492KT; Rotunda Creek 510KT; Doornhoek 545KT; Breytenbachskraal 556KT; Desire 563KT; Hermansberg 495KT; Klondyke 493KT; Manx 475KT; Vaalhoek 474KT; Willemsoord 476KT; Black Hill 528KT.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. However, according to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *Globesight* to undertake a cultural heritage assessment to determine if the proposed development of the proposed mining activities would have an impact on any sites, features or objects of cultural heritage significance.

This report forms part of the Environmental Impact Assessment (EIA) as required by the EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and is intended for submission to the South African Heritage Resources Agency (SAHRA).

2. TERMS OF REFERENCE

The aim of a full HIA investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective.

The result of this investigation is a heritage impact assessment report indicating the presence/ absence of heritage resources and how to manage them in the context of the proposed development.

Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, on condition of successful implementation of proposed mitigation measures.

2.1 Scope of work

The aim of this study is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where the mining activities is to take place. This includes:

- Conducting a desk-top investigation of the study areas;
- A visit to the proposed development sites.

The objectives were to:

- Identify possible archaeological, cultural and historic sites within the proposed development areas;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

2.2 Assumptions and Limitations

The investigation has been influenced by the following factors:

- It is assumed that the description of the proposed project, provided by the client, is accurate.
- No subsurface investigation (i.e. excavations or sampling) were undertaken, since a permit from SAHRA is required for such activities.
- It is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is sufficient and that it does not have to be repeated as part of the heritage impact assessment.
- The unpredictability of buried archaeological remains.
- This report does not consider the palaeontological potential of the site.

3. LEGISLATIVE FRAMEWORK

The HIA is governed by national legislation and standards and International Best Practise. These include:

- South African Legislation
 - National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) – see Appendix 4 for more detail on this Act
 - Mineral and Petroleum Resources Development Act, 2002 (Act No. 22 of 2002) (MPRDA);
 - National Environmental Management Act 1998 (Act No. 107 of 1998) (NEMA); and
 - National Water Act, 1998 (Act No. 36 of 1998) (NWA).
- Standards and Regulations
 - South African Heritage Resources Agency (SAHRA) Minimum Standards;
 - Association of Southern African Professional Archaeologists (ASAPA) Constitution and Code of Ethics;
 - Anthropological Association of Southern Africa Constitution and Code of Ethics.
- International Best Practise and Guidelines
 - ICOMOS Standards (Guidance on Heritage Impact Assessments for Cultural World Heritage Properties); and

- The UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage (1972).

4. HERITAGE RESOURCES

4.1 The National Estate

The NHRA (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, including-
 - ancestral graves;
 - royal graves and graves of traditional leaders;
 - graves of victims of conflict;
 - graves of individuals designated by the Minister by notice in the Gazette;
 - historical graves and cemeteries; and
 - other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery in South Africa;
- movable objects, including-
 - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - objects to which oral traditions are attached or which are associated with living heritage;
 - ethnographic art and objects;
 - military objects;
 - objects of decorative or fine art;
 - objects of scientific or technological interest; and
 - books, records, documents, photographic positives and negatives, graphic, film or video material 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).

4.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that "cultural significance" means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature's uniqueness, condition of preservation and research potential.

According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of

- its importance in the community, or pattern of South Africa's history;
- its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;

- its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- sites of significance relating to the history of slavery in South Africa.

A matrix was developed whereby the above criteria were applied for the determination of the significance of each identified site (see Appendix 3). This allowed some form of control over the application of similar values for similar identified sites.

5. STUDY APPROACH AND METHODOLOGY

5.1 Extent of the Study

This survey and impact assessment covers the area as presented in Section 7 below and illustrated in Figure 2 & 3.

5.2 Methodology

5.2.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources were consulted – see list of references in Section 11.

- Information on events, sites and features in the larger region were obtained from these sources.

5.2.1.2 Data bases

The *Heritage Atlas Database*, various SAHRA databases, the *Environmental Potential Atlas*, the *Chief Surveyor General* and the *National Archives of South Africa* were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed development.

5.2.1.3 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information of a very general nature were obtained from these sources

5.2.1.4 Interviews

- Ms C van Wyk-Rowe, former curator of the Pilgrim's Rest Museum and acknowledged expert on the prehistory and history of the larger region – 06/10/2017.
- Mr J Fourie, Strategic Planning & Environmental Advisor, Stonewall Mining – 06/10/2017.

5.2.1.5 Public participation

This process was completed by Ms Diana Verster of *Batho Earth* and a final scoping report was issued in May 2017. It is taken that this process and subsequent report was sufficient in scope and nature to be accepted as part of the heritage impact assessment process and that it does not have to be specifically repeated for the HIA. The relevant issues raised in the report (Verster 2017) are presented in Appendix 6 below.

The results of the above investigation are summarised in Table 1 below – see list of references in Section 11.

Table 1: Pre-Feasibility Assessment

Category	Period	Probability	Reference
Early hominin	Pliocene – Lower Pleistocene		
	Early hominin	None	
Stone Age	Lower Pleistocene – Holocene		
	Early Stone Age	None	
	Middle Stone Age	Low	Van Wyk-Rowe (1997)
	Later Stone Age	Low	Van Wyk-Rowe (1997)
	Rock Art	Low	Van Wyk-Rowe (1997)
Iron Age	Holocene		
	Early Iron Age	None	
	Middle Iron Age	None	
	Later Iron Age	Medium	Van Wyk-Rowe (1997)
Colonial period	Holocene		
	Contact period	Medium	
	Recent history	Medium	Bonner & Shapiro (1993); Cartwright (1962); Pistorius (2005); Van Schalkwyk (2004, 2015)
	Industrial heritage	High	Fourie (2017); Fowler (1986); Van Wyk-Rowe (2017)

5.2.2 Field survey

The field survey was done according to generally accepted archaeological practices, and was aimed at locating all possible sites, objects and structures. The areas that had to be investigated was identified by *Globesight* by means of maps and .kml files indicating the development areas. This was loaded onto an Asus digital device and used in Google Earth during the field survey to access the areas.

Although the mine operations would cover large areas, in all cases most of this would be located underground. Accordingly, only the surface areas where impacts would occur, e.g. shaft head infrastructure sites, rock loading sites and possible access routes were surveyed. All the study areas were visited during the week of 11 to 15 September 2017. In addition, known heritage sites and sites that were identified during the field survey, but located in the larger region, were also documented.

The following factors had an impact on the field survey:

- During the site visit, the archaeological visibility was in many areas limited by the dense vegetation cover – see images in Fig. 1 below.
- The presence of illegal miners (referred to as *zama-zamas*) presented a real threat to the safety of the various specialists and they had to travel in groups, accompanied by armed security guards.

- Due to the dry conditions, strong winds this time of year and the high daily temperatures, extreme care had to be taken not to cause veld fires, which, in some cases, limited mobility.



Fig. 1. Vegetation cover encountered in some areas.

5.2.3 Documentation

All sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual localities are determined by means of the *Global Positioning System* (GPS) and plotted on a map. This information is added to the description in order to facilitate the identification of each locality.

The track log and identified sites were recorded by means of a Garmin Oregon 550 handheld GPS device. Photographic recording was done by means of a Canon EOS 550D digital camera.

Map datum used: Hartebeeshoek 94 (WGS84).

6. SITE SIGNIFICANCE AND ASSESSMENT

6.1 Heritage assessment criteria and grading

The National Heritage Resources Act, Act no. 25 of 1999, stipulates the assessment criteria and grading of heritage sites. The following grading categories are distinguished in Section 7 of the Act:

Table 2: Site Grading System.

SAHRA Cultural Heritage Site Significance			
Field Rating	Grade	Significance	Recommended Mitigation
National Significance	Grade I	High significance	Conservation by SAHRA, national site nomination, mention any relevant international ranking. No alteration whatsoever without permit from SAHRA
Provincial	Grade II	High	Conservation by provincial heritage authority, provincial

Significance		significance	site nomination. No alteration whatsoever without permit from provincial heritage authority.
Local Significance	Grade III-A	High significance	Conservation by local authority, no alteration whatsoever without permit from provincial heritage authority. Mitigation as part of development process not advised.
Local Significance	Grade III-B	High significance	Conservation by local authority, no external alteration without permit from provincial heritage authority. Could be mitigated and (part) retained as heritage register site.
Generally Protected A	Grade IV-A	High/medium significance	Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority.
Generally Protected B	Grade IV-B	Medium significance	Conservation by local authority. Site should be recorded before destruction. Destruction permit required from provincial heritage authority.
Generally Protected C	Grade IV-C	Low significance	Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit required from provincial heritage authority.

The occurrence of sites with a Grade I significance will demand that the development activities be drastically altered in order to retain these sites in their original state. For Grade II, III and IV sites, the applicable of mitigation measures would allow the development activities to continue.

6.2 Methodology for the assessment of potential impacts

All impacts identified during the EIA stage of the study will be classified in terms of their significance. Issues were assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected and how it will be affected;
- The physical **extent**, wherein it is indicated whether:
 - 1 - the impact will be limited to the site;
 - 2 - the impact will be limited to the local area;
 - 3 - the impact will be limited to the region;
 - 4 - the impact will be national; or
 - 5 - the impact will be international;
- The **duration**, wherein it is indicated whether the lifetime of the impact will be:
 - 1 - of a very short duration (0–1 years);
 - 2 - of a short duration (2-5 years);
 - 3 - medium-term (5–15 years);
 - 4 - long term (> 15 years); or
 - 5 - permanent;
- The **magnitude** of impact, quantified on a scale from 0-10, where a score is assigned:
 - 0 - small and will have no effect;
 - 2 - minor and will not result in an impact;
 - 4 - low and will cause a slight impact;
 - 6 - moderate and will result in processes continuing but in a modified way;
 - 8 – high, (processes are altered to the extent that they temporarily cease); or
 - 10 - very high and results in complete destruction of patterns and permanent cessation of processes;
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring and is estimated on a scale where:
 - 1 - very improbable (probably will not happen);
 - 2 - improbable (some possibility, but low likelihood);
 - 3 - probable (distinct possibility);
 - 4 - highly probable (most likely); or
 - 5 - definite (impact will occur regardless of any prevention measures);

- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- The **status**, which is described as either positive, negative or neutral;
- The degree to which the impact can be reversed;
- The degree to which the impact may cause irreplaceable loss of resources; and
- The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

$S = (E+D+M) \times P$; where
 S = Significance weighting
 E = Extent
 D = Duration
 M = Magnitude
 P = Probability

The **significance weightings** for each potential impact are calculated as follows:

Table 3: Significance Ranking

Significance of impact					
Extent	Duration	Magnitude	Probability	Significance	Weight
-	-	-	-	-	-
Points	Significant Weighting	Discussion			
< 30 points	Low	Where this impact would not have a direct influence on the decision to develop in the area.			
31-60 points	Medium	Where the impact could influence the decision to develop in the area unless it is effectively mitigated.			
> 60 points	High	Where the impact must have an influence on the decision process to develop in the area.			

7. PROJECT DESCRIPTION

7.1 Site location

The following information is derived from Pieterse (2017):

The proposed study area is situated 10 kilometres to the south and 26 kilometres to the north of the town of Pilgrim's Rest. The proposed property area falls within the jurisdiction of the Thaba Chweu Local Municipality and within the greater Ehlanzeni District Municipality, Mpumalanga Province (Fig. 2 below). For more information, see the Technical Summary on p. iv above.

TGME is applying for a Mining Right on the farms Buffelsfontein 452KT; Granite Hill 477KT; Sacramento Creek 492KT; Rotunda Creek 510KT; Doornhoek 545KT; Breytenbachskraal 556KT; Desire 563KT; Hermansberg 495KT; Klondyke 493KT; Manx 475KT; Vaalhoek 474KT; Willemsoord 476KT; Black Hill 528KT.

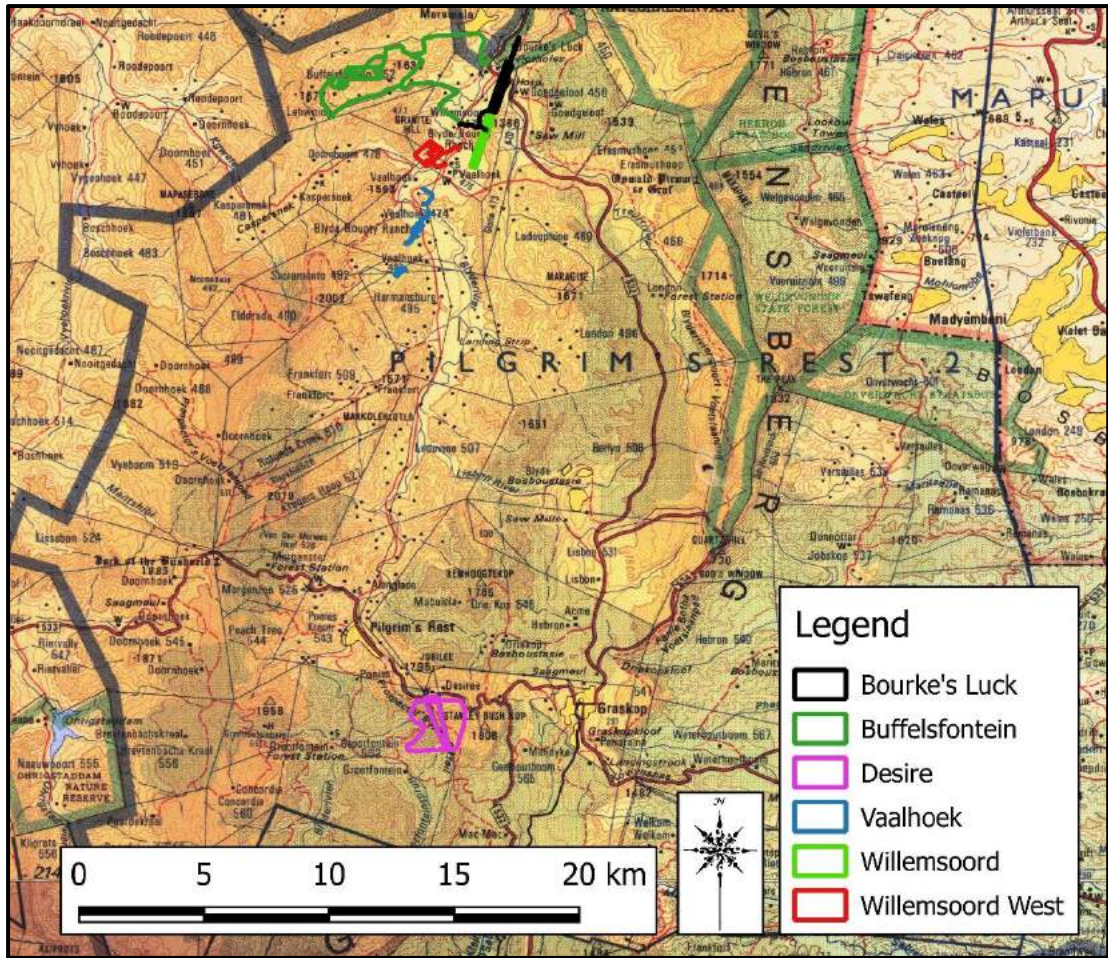


Fig. 2. Location of the study area in regional context. (Map 2430: Chief Surveyor-General)

7.2 Development proposal

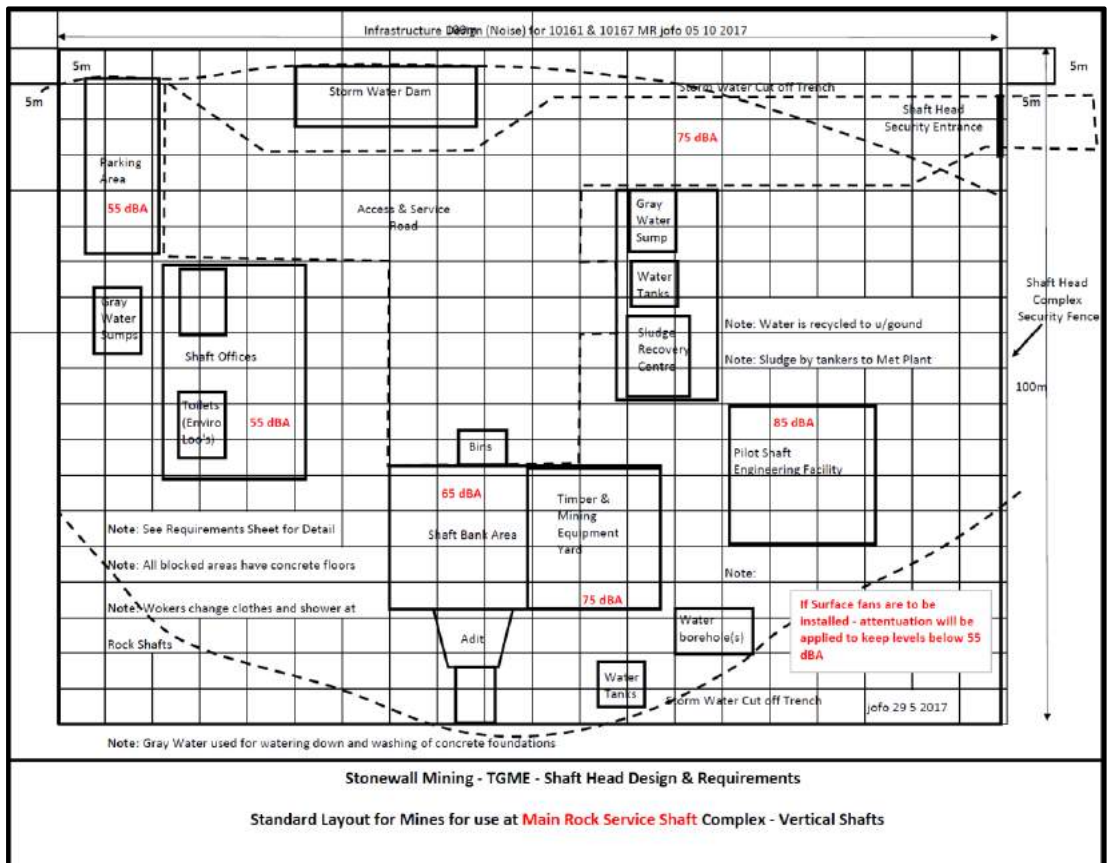
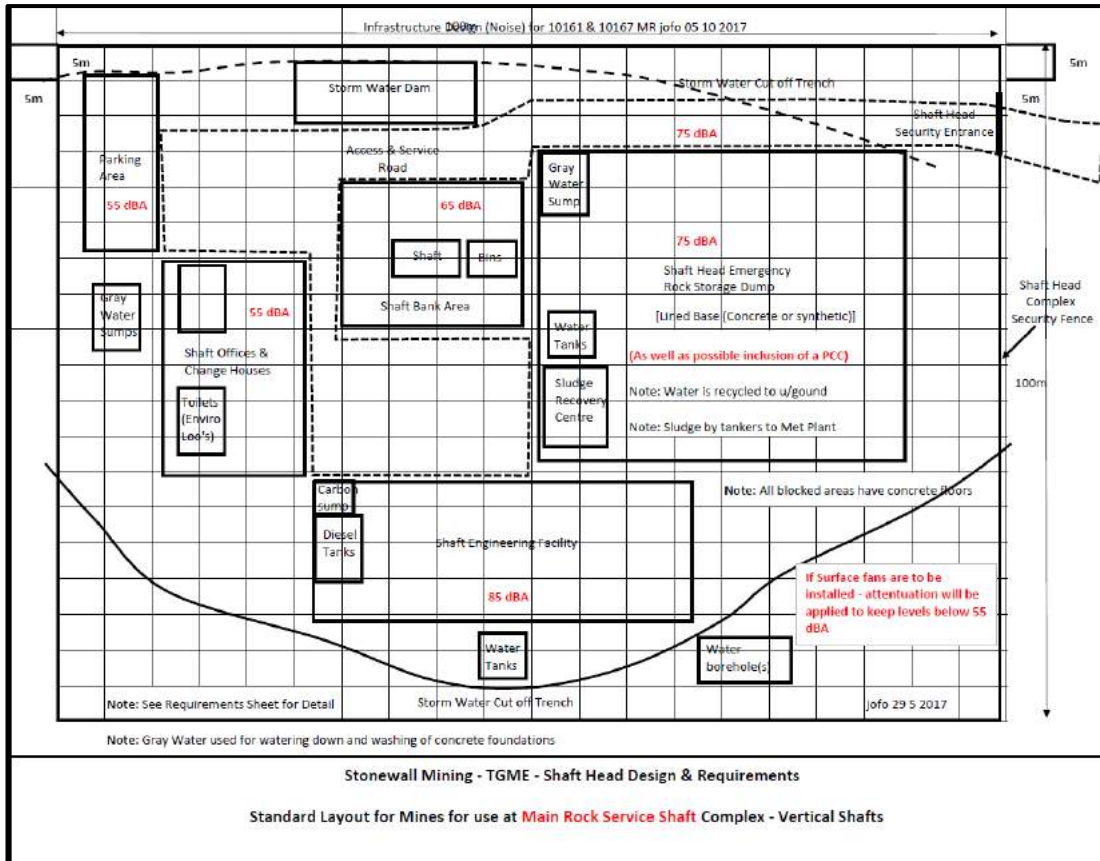
The mineral rights area extends over 16 542,8946 hectares. The Mines planned to be exploited include (but are not limited to historic mines) are the following: Willemsoordt, Bourkes Luck, Vaalhoek, Desire Rotunda Creek and Black Hill (only underground extensions) and Doornhek and Breytenbachskraal (only underground extensions).

In order for the PMR Mining and Hard Rock Mining (HRM) Projects to be part of the Life of Mine Plan, a rapid build-up of tons that could be sustained for at least the first 5 years would be developed. The planned strategy is to open-up the historical entrances/portals to the mines.

This will be followed by ensuring that these portals and access ways are safe to use, to access the PMR sources, sampling the reserves and verifying the conditions in detail. Hereafter it is planned that equipping would start and finally the removal/mining of the reserve referred to as Hard Rock Mining.

The proposed layout of facilities at the three different types of operations are presented in the diagrams below (Fig. 3):

- Main Rock Service Shaft complex – vertical shafts,
- Main Rock Service Shaft complex – vertical shafts (adits),
- Surface Shaft complex – horizontal adits.



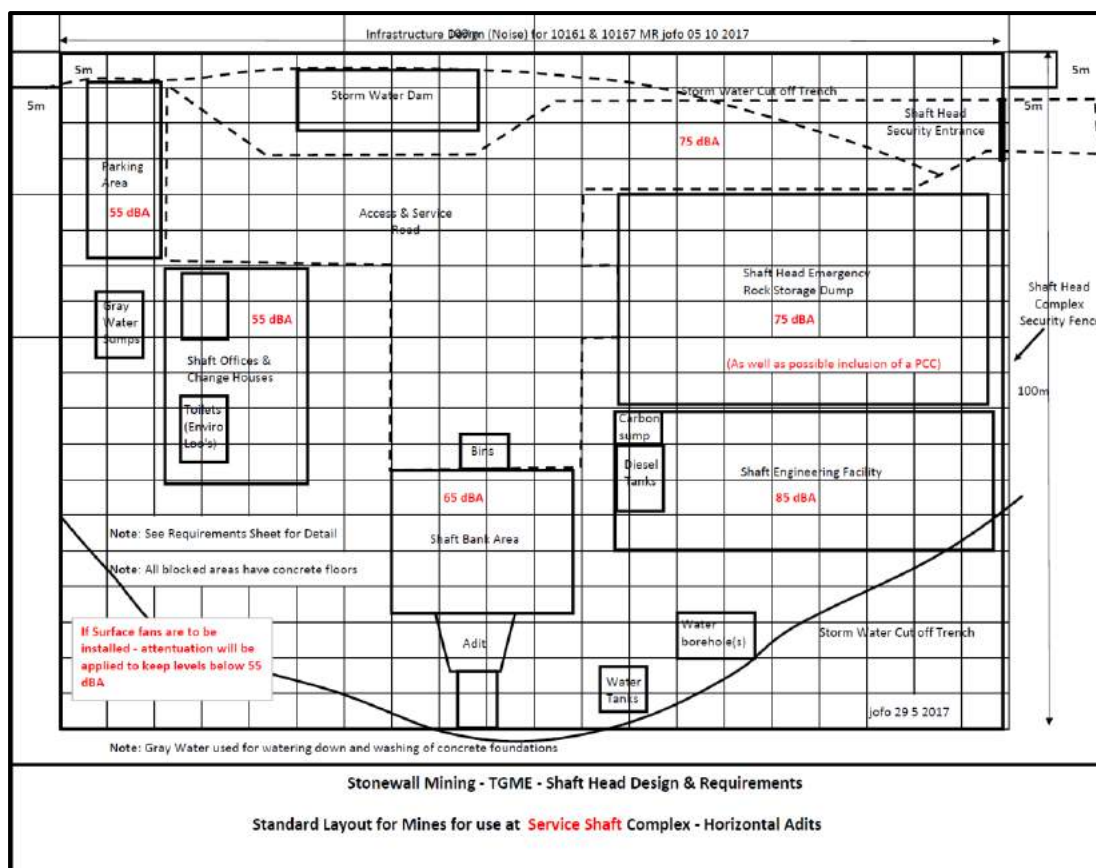


Fig. 3. Standard layout for mines for use at the different types of mining operations. (Courtesy Mr J Fourie, Stonewall Mining)

8. DESCRIPTION OF THE AFFECTED ENVIRONMENT

8.1 Site description

The following information is derived from Pieterse (2017):

The topography on the farms Buffelsfontein 452KT; Granite Hill 477KT; Sacramento Creek 492KT; Rotunda Creek 510KT; Doornhoek 545KT; Breytenbachskraal 556KT; Desire 563KT; Hermansberg 495KT; Klondyke 493KT; Manx 475KT; Vaalhoek 474KT; Willemsoord 476KT; Black Hill 528KT is undulating and rises rapidly from the Blyde River into mountainous terrain to the west. Access to the area is via tar roads, gravel roads and forestry gravel roads which are used to a larger or lesser extent – depending on the geographical location.

8.2 Overview of the region

The aim of this section is to present an overview of the history of the larger region in order to eventually determine the significance of heritage sites identified in the study area, within the context of their historic, aesthetic, scientific and social value, rarity and representivity – see Section 3.2 and Appendix 3 for more information.

The cultural landscape qualities of the region essentially consist of two components. The first is made up of a limited pre-colonial (Stone Age and Iron Age) occupation. The second component is a rural area in which the human occupation consists of two elements. The discovery of gold during the late 19th century resulted in a flood of people entering the area, establishing gold mining activities all over the landscape. The second element is a rural farming community, which, since the early 20th century revolved around forestry, which altered the landscape beyond recognition. These two elements led to the establishment of a number of smaller towns in the region, all which are now part of an ongoing tourism industry.

8.2.1 Early history

Very little habitation of the eastern highveld and escarpment area took place during Early Stone Age times. One exception is at Bushman Rock Shelter, which has deposits covering the complete span of human occupation, since Early Stone Age to early historic times.

It was only during the Middle Stone Age (MSA) that people, by applying a range of strategies for survival and using more complex tool kits, manage to occupy areas that were earlier avoided. During Middle Stone Age times (c. 150 000 – 30 000 BP), people became more mobile, occupying areas formerly avoided. In many cases, tools dating to this period are found on the banks of the many pans that occur all over. The MSA is a technological stage characterized by flakes and flake-blades with faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology.

Late Stone Age (LSA) people had even more advanced technology than the MSA people and therefore succeeded in occupying even more diverse habitats. Some sites are known to occur in the region. These are mostly open sites located near river and pans. For the first time we also 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 with incised markings are traditionally linked with the LSA.

The LSA people have also left us with a rich legacy of rock art, which is an expression of their complex social and spiritual beliefs. Such sites are located on a number of farms such as London, Ledophine, Berlyn, Ponieskrantz, Dientjie, Bourke's Luck and Clear Stream (Van Wyk-Rowe 1997).

Iron Age people started to settle in southern Africa c. AD 200 at Silver Leaves and AD 280 at Eiland. Having only had cereals (sorghum, millet) that need summer rainfall, Early Iron Age (EIA) people did not move outside this rainfall zone, and neither did they occupy the central interior highveld area. Because of their specific technology and economy, Iron Age people preferred to settle on the alluvial soils near rivers for agricultural purposes, but also for firewood and water. Sites dating to the Early Iron Age are found, for example near Lydenburg, as well as Ohrigstad (Van Wyke-Rowe 1997).

The occupation of the larger geographical area (including the study area) did not start much before the 1500s. By the 16th century things changed, with the climate becoming warmer and wetter, creating condition that allowed Late Iron Age (LIA) farmers to occupy areas previously unsuitable, for example the highveld regions of Mpumalanga, where they established hundreds of stone walled settlements.

8.2.2 Historic period

History of Gold Mining in Pilgrim's Rest Area

The first gold in the Pilgrim's Rest valley was discovered in 1873 by a lone traveller and prospector, Alec "Wheelbarrow" Patterson - nicknamed as such due to his years of using a wheelbarrow to transport all his possessions across the Eastern Transvaal on his quest to find gold. He kept his rich findings of alluvial gold a secret, fearing the multitude of

prospectors that would descend on the area. However, news of gold in the Pilgrim's Rest area made international headlines when, shortly after Patterson, William Trafford also discovered gold in the area. Legend has it that the area acquired its name when Trafford, in pure delight, yelled loudly: "The Pilgrim is at Rest" and the mountains echoed back "Pilgrim's rest...rest".

Officially declared as a goldfield on 14 May 1873, the large amount of alluvial gold in the area led to a stampede of prospectors and their families vying for claims. The mines commissioner had to relocate from Mac-Mac in order to deal with the situation as, within a year after the gold discovery, 1 500 settlers were already working their own claims. Numerous hills around the area were also found to be rich with ore, the highest yielding ones being Jubilee, Ponieskrantz, Desiree, Brown's Hill, Bourke's Luck, Poverty Creek and Starvation Gulch. During the first few years of mining the retrieval of alluvial gold remained the most popular and profitable, with an estimated yield worth two million Rand being retrieved (TPA B&M 1981:1).

The town of Pilgrim's Rest grew from a camp of temporary tents and "*sinkwonings*" into what is roughly still visible today. Efforts to declare Pilgrim's Rest as a town started in 1894, but even by the outbreak of the Anglo-Boer war in 1899 this decision had still not been finalised by talks between the state and mining industry. By that time the town consisted of some 200 white settlers, with several thousand black inhabitants living in surrounding areas. By 1899 the business sector in the town consisted of two hotels, the Royal and the Pilgrim's, two banks and ten shops that included a butchery, pharmacy and general merchants. The school was housed in an old wooden building up until 1896, when it was moved to an old town hall. The education law instating English to be taught as a second language in 1896 led to the priest, Hon. Colin Rae opening the St. Mary's School at the Wesleyan church. It was only in 1899 that the state agreed to take over and subsidise the school, leading to the foundation of the new school building to be laid on the 1st of February 1899 (TPA B&M 1981:5, 6)

The period of plenty was not to last however, as the annexation of the Transvaal by the British in 1877 and the First Independence War (1880 – 1881) caused the mining sector to come to grinding halt. Despite securing their independence again in 1881, large scale depression was evident among the population, forcing the newly reinstated Republican Government to make exclusive concessions to certain individuals and companies in order to reignite all manner of industries (TPA B&M 1981:2).

David Benjamin, a financier from London, brokered an arrangement with the Government for mining rights in the areas of Ponieskrantz, Ledovine, Waterhoutboom, Driekop, Grootfontein and Belvedere. The details of this contract were as follows: Benjamin would pay an annual sum of £ 1 000 to the Government, guaranteed to have full mining industry works back to full earning within two years and to employ a minimum of 25 white personnel at the same time. The Government agreed to this contract, but included that Benjamin had to reimburse(?) the current occupants and owners in the area. With the aid of the State attorney, Jorrisen, the contract was finalised and led to the creation of the Transvaal Gold Exploration Company in 1882. Garner Williams, a well-known mining engineer from Kimberley, was given the post of local manager. The company was initially unable to declare any dividends, but after gold was discovered at Jubilee and Columbia Hill by Charlie Robinson, production started increasing rapidly. Soon numerous other mining companies formed, the most important of which were to be Pilgrim's Mining and Estate Company, Jubilee Mines Ltd. and New Clewer Estates (TPA B&M 1981:2).

In 1885 H. Eckstein & Co., a mining company from the Witwatersrand, acquired a majority stake in the Transvaal Gold Exploration Company and, amalgamated with several other mining groups, was renamed the Lydenburg Gold Mining Estates (TPA B&M 1981:2). During a special meeting on 29 July 1896 the company was once again renamed, this time becoming The Transvaal Gold Mining Estates Ltd (TGME) (Fowler 1986:292). TGME's mining industries were prolific for some time in the Pilgrim's Rest valley, with more than a dozen mines operating at the same time, while TGME's mines in Ponieskrantz - oddly named as letters of the Greek alphabet – Beta (that produced gold for 85 years until 1971), Eta, Theta, Iota and

Chi, were also showing dividends. Till today no one knows why, or who, decided to name these mines in a foreign alphabet (TPA B&M 1981:3).

The first consultant engineer for TGME, Mr Wertheman, decided to create a central processing plant where the ore from Jubilee, Clewer, Beta and Theta could be processed at the same time and he thus also insisted on having a train line laid down from the mines to the central processing plant. This endeavour proved difficult as there were no natural deposits of coal to power steam engines, but TGME decided to lay down an electric rail road which ran on hydroelectricity generated at the Brown's Hill plant. The original railway was insufficient for the needs of the mines, so in 1897 a tramline, running for 12km and built at the cost of £17 000, was laid down. Only ore from the Clewer and Beta mines were transported via this railway, while for 60 years the other mines made successful use of mules to transport ore (TPA B&M 1981:3).

TGME mines had a good understanding with their employees for many years, reporting no strikes or unrest. It was only during the unrest in the Rand mines that TGME had to deal with renegotiating salaries, but it was achieved peacefully with no strikes or violence (TPA B&M 1981:6; Fowler 1986:296).

In 1899 another war broke out between the Transvaal Republic and the British, which would once again bring all mining in the area to a full halt. As the British never cared much for the land east of Lydenburg, the *Boerekommandoes* used it as a place of rest between their attacks. Despite efforts to maintain gold production for the Boere the majority of TGME miners were banished to Delagoabaai, with only two men left behind to look after the mines. The war brought a shortage of money, and it was decided to use the gold and tools left behind in the TGME workshops to start the small production of coins, called "*veldsponde*". Barberton's school principal, Mr P.J. Kloppers, was put in charge of the "Staatsmunt te Velde" where a 986 "*veldsponde*", branded with "Z.A.R. 1902" on one side, and "*Een Pond*" on the other, were produced. Partially made from gold mined at Pilgrim's Rest and partially by that supplied from the Pretoria Munt, these coins still hold great value as collector's items today (TPA B&M 1981:4; Fowler 1986:293).

Despite the complete cessation of all production during the war, the mine equipment has sustained no damage, and thus production was restored almost immediately. However, this was not to be without its own challenges. New manager, Hugh Hughes, due to severe lack of able-bodied workers, was forced to bring in a work force of Asian immigrants to try reach previous production values. Furthermore, the devastation left after the war meant that the cost of shipping had increased exponentially, leaving hundreds of tons worth of gold piling up at Machadodorp. The closets railways were at Nelspruit and Machadodorp, leaving the inhabitants of Pilgrim's Rest with no other choice but to return to the use of oxen and "*ossewaens*" (ox drawn wagons) to collect and replenish their necessary foodstuff and goods, although the services of mule drawn carriages – the "*Zeerderberg-poskoets*" were available for passengers, this type of transport was ineffective and completely useless to the mines. Despite talks of building a railway between Pilgrim's Rest and Graskop, this would only be realised in 1914. Mining profits were only achieved again in 1904, with the Theta mine producing more than 40 000 ton of ore in 1907. This was followed by another gold rush in 1908, where 500 miners came to stake claims, mostly in the Jubilee mine surroundings (TPA B&M 1981:4).

The next two years would show some horrific disasters: firstly, the old mill in Camel's Creek burnt to the ground on the 9th of July 1908, and second, even more grievously, the devastating flood on 2 January 1909, where a seven hour long storm wreaked havoc on the town and mines. The Blyderiver rose approximately 30 feet, with rain fall exceeding 212.5mm. It swept away all bridges, the Jubilee station, the central cyanide compound and the electric tramline, killing 6 people in Clewer as well as causing the deaths of three boys and injuring another four people in a landslide that overwhelmed a village of huts. The damage to the mines was also devastating, with the main drives at various mines collapsing at the mouths (TPA B&M 1981:5).

TGME would only start to see true difficulties in the Pilgrim's Rest area after 1914, with production in the mines falling sharply from a record amount of R570 936 in 1914, steadily declining until only showing profits of R31 102 in 1919. The years after the First World War proved even more difficult for TGME, and in an effort to stem loss of profit it was decided to develop an experimental plantation to enter the profitable lumber industry. Led by project manager Mr. Robert Gardner, the planting of wattle trees and "*bloekombome*" had reached 3 664 acres by 1927. This would become a national operation, which still flourishes today (TPA B&M 1981:6). The announcement of the devaluation of the pound, announced by Mr Havenga in 1932, brought temporary relief to the mines, as the price of gold now rose from 4s 10d to 124s per ounce. However, the 1940's led to yet another decline in mine production in the area, despite another devaluation of the pound in 1941 (Fowler 1986:293). TGME had been through tumultuous times in its history in the Pilgrim's Rest area, having delivered some 300 000 tons of ore per year between 1935 and 1955, with a record yield of 403 000 ton during the 1941 – 1942 financial year, but production had dwindled to an average of roughly 50 000 ton per year during the 1950's. Despite having had to face natural disasters, pestilence (eg. "*runderpest*" in 1896), low grade ore, three wars, unstable ground, veld fires, horse-sickness and mudslides (Fowler 1986:296) the sheer amount of ore generated in the area is actually astounding, with the area having delivered R16 350 000 000 (of which the first R2 000 000 was from alluvial gold). Sadly, the decline in production meant that mines started closing and in 1968 TGME was forced to sell some of their rights to Rand Mines Properties (RMP). After the closing of its last mine, Beta, TGME sold the last of their assets to RMP in 1971 (TPA B&M 1981:7).

Bourke's Luck Gold Mine, underlying sections of the farms Dientjie 453KT, Bourke's Luck 454 KT and Willemsoord 475KT, was closed in 1955 but yielded approximately 4,5 t of gold over a span of 7,5 km and also yielded sellable copper and iron pyrite by-products (Ward & Wilson 1998:362).

Pilgrim's Rest Central Mines were formed by approximately a dozen or so mines in the area, with the highest yielding being Desire, Theta, Beta, Columbia Hill, Duke's Hill-Clewere, Junilee and Ponieskrans Mines. The approximate gold ore yield of about 106,8 t was transported from the mines to a centralised, common beneficiation and roasting plant, which aided in prolonging the profitability of Transvaal Gold Mining Estate's interests in the Vaalhoek and Pilgrim's Rest area. As with most mines in the area there were widespread complications with broken ground, underground water and refractory ore (Fowler 1986).

Other mines in the area, namely Vaalhoek Gold Mine, closed in 1956, Elandsdrift mine, underlying the farm Elandsdrift 220JT which was an opencast mine closed in 1944 and the Mamre-Slaaihoek Mines, all closed due to the same problems as the bigger mines as well as due to the poor quality and erratic distribution of gold ore (Ward & Wilson 1998:363).

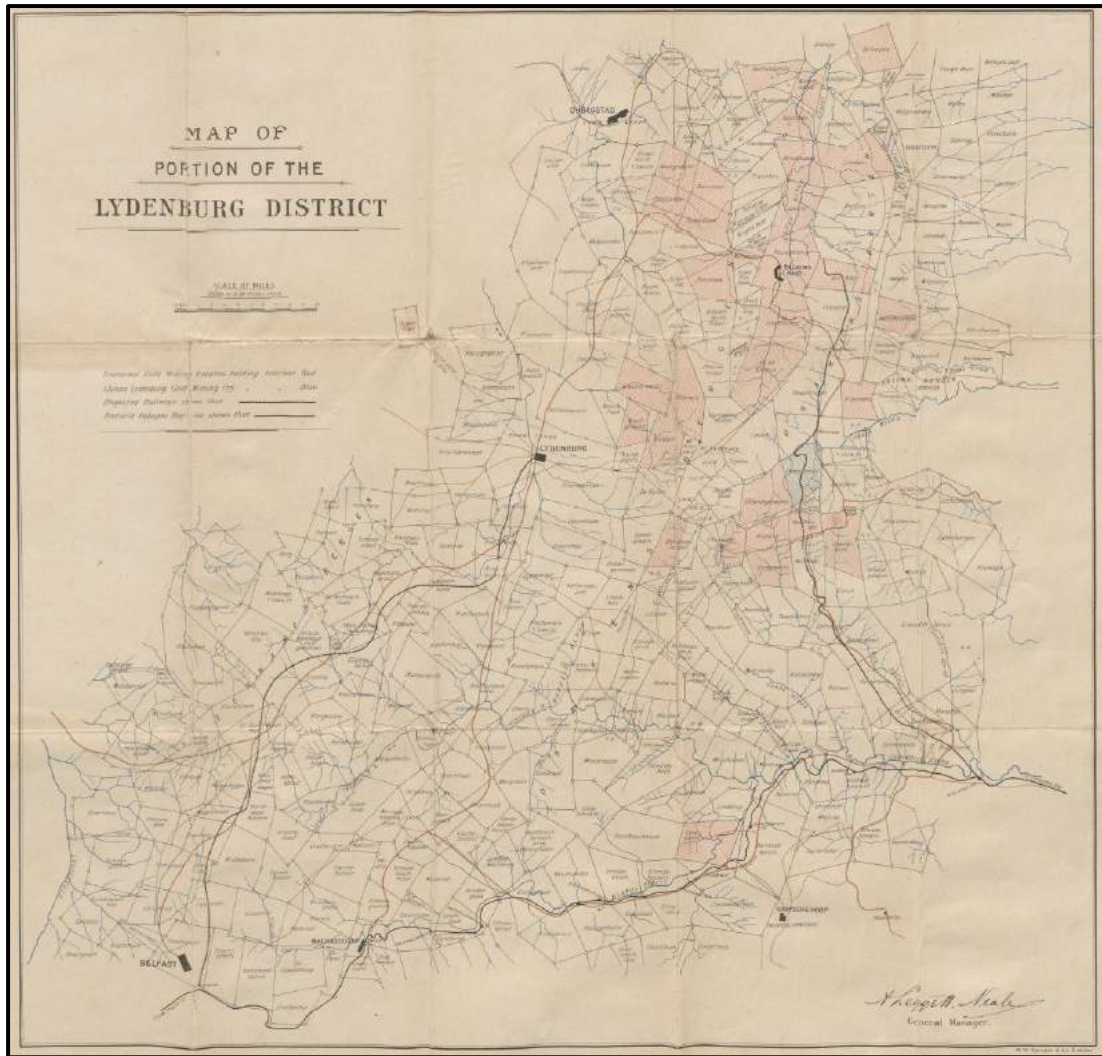


Fig. 4. Neale's map, dating to 1904, showing the ownership of the various farms.

8.3 Impact assessment

Heritage impacts are categorised as:

- Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries;
- Indirect impacts, e.g. restriction of access or visual intrusion concerning the broader environment;
- Cumulative impacts that are combinations of the above.

Impacts can be managed through one or a combination of the following measures:

- Mitigation
- Avoidance
- Compensation
- Enhancement (positive impacts)
- Rehabilitation
- Interpretation
- Memorialisation

Sources of risk were considered with regards to development activities defined in Section 2(viii) of the NHRA that may be triggered and are summarised in Table 4 below. These issues formed the basis of the impact assessment described. The potential risks are discussed according to the various phases of the project below.

Table 4. Potential Risk Sources.

	Activity	Description	Risk
Issue 1	Removal of Vegetation	Vegetation removal for site preparation and the installation of required infrastructure, e.g. access roads and water pipelines.	The identified risk is damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.
Issue 2	Construction of required infrastructure, e.g. access roads, water pipelines	Construction machinery and vehicles will be utilised to construct the required infrastructure, e.g. access roads and water pipelines.	The identified risk is damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.
Issue 3	Stockpiling of topsoil	Soil from prospecting areas will be accommodated in designated spots to be returned to point of origin after completion of prospecting.	The identified risk is damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.

Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development and is presented in Appendix 7 and summarised in Table 5 below:

Determining significance

Determining the significance of the various identified features involved the evaluation of each type of feature within the context of the history of gold mining in the larger region. It should be noted that many of the mines had a 'start-stop-start' history that can stretch over many years, which makes dating them difficult.

The following is based on a discussion with Mr Fourie of Stonewall Mining, who is responsible for compiling detailed surface and subsurface maps of the various TGME mines and mining related features in the Pilgrim's Rest and Sabie regions for their environmental policy.

- Adits

These are basically a trench cut into the side of the hill. Most of them are not very deep or long and, after having been abandoned, have being "reclaimed" by nature (erosion, plant growth, etc.).

According to Mr Fourie, there can be thousands of such adits in the larger landscape and they are discovering more as the mapping process continue.

- Due to the large number of similar adits as well as the fact that they do not exhibit any particular structural features, they are viewed to have low significance. They

are viewed as having been sufficiently recorded after inclusion on these maps and for the purpose of this study requires no further recording before destruction.

- Horizontal shafts

These are similar to the adits described above, but developed into tunnels that extend in many cases over long distances horizontally into the mountain.

According to Mr Fourie there are hundreds of horizontal shafts located in the larger landscape and they are continually discovering new ones as the mapping process continue.

- Due to the number of similar horizontal shafts, they are viewed to have low significance, but, for the purpose of this study, it is deemed necessary to evaluate each individual feature by itself.

- Mining sites

Most smaller mines had offices, store rooms, overhead shafts, rock loading facilities, etc. In most cases, the ore was shipped to a central location, e.g. Pilgrim's Rest, for further treatment. In almost all instances, these structures were demolished when a particular mine was closed down.

According to Mr Fourie, only a few such sites still exist.

- Due to the small number of similar mines remaining, they are viewed to have high significance and, for the purpose of this study, it is necessary to evaluate each individual feature by itself.

- Rock dumps (waste dump)

These are found at all the mines. They have all been captured on the maps that have been compiled for the larger region.

According to Mr Fourie it is planned that the rock dumps will be reworked and eventually be rehabilitated.

- Due to their nature, these features are viewed to have a low significance, and therefore, for the purpose of this study, it would be unnecessary to evaluate each individual feature by itself. They are viewed to have been sufficiently recorded after inclusion in the mapping programme and requires no further recording before destruction.

8.4 Identified sites

The following sites, features and objects of cultural significance were identified in the study area – see Appendix 7 for a discussion of each individual site. In terms of Section 7 of the NHRA, all the sites currently known or which are expected to occur in the study area are evaluated to have a grading as identified in the table below.

8.4.1 Stone Age

- No sites, features or objects dating to the Stone Age were identified in the study area.

8.4.2 Iron Age

- A single stone walled site dating to the Late Iron Age was identified in the larger study area – see Table 5 below.

8.4.3 Historic period

- A variety of sites and features dating to the historic period were identified. These are mostly relating to the gold mining industry and are summarised in Table 5 below.

Table 5: Summary of Identified Heritage Resources in the Study Areas.

IDENTIFIED HERITAGE RESOURCES					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After	Proposed mitigation (Refer to definitions below)
Vaalhoek					
Vh 01	Mine structure	Section 34	High significance – Grade III-B	Medium (48) Low (24)	(2) Document site / (3) Rehabilitate buildings for re-use
Vh 02	Mine structure	Section 34	Medium significance – Grade IV-B	Medium (48) Low (24)	(2) Document site
Vh 03	Grave	Section 36	Medium significance – Grade IV-A	Low (20) Low (20)	(1) Avoid – fence off
Willemsoord					
Wo 01	Homestead	Section 34	Medium significance – Grade IV-B	Medium (48) Low (20)	(1) Avoid / (2) excavate archaeologically
Wo 01	Power line	Section 34	High significance – Grade III-B	Low (20) Low (20)	(1) Avoid
Willemsoord West					
WoW 01	Farmstead	Section 34	Medium significance – Grade IV-C	Low (20) Low (20)	(1) Avoid / (2) excavate archaeologically
WoW 02	Iron Age settlement	Section 35	High significance – Grade III-B	Low (20) Low (20)	(1) Avoid / (2) excavate archaeologically
Bourke's Luck					
BL 01	Adit	Section 34	Low significance – Grade IV-C	Medium (48) Low (20)	(4) Considered documented in full
BL 02a	Homestead	Section 34	High significance – Grade III-B	Medium (48) Low (20)	(1) Avoid / (2) excavate archaeologically
BL 02b	Burial site	Section 36	Medium significance – Grade IV-C	Medium (48) Low (20)	(1) Avoid / (2) excavate archaeologically
BL 03	Burial site	Section 36	High significance – Grade III-B	Low (20) Low (20)	(1) Avoid / (2) excavate archaeologically
BL 04	Power line	Section 34	High significance – Grade III-B	Low (20) Low (20)	(1) Avoid / (2) excavate archaeologically
BL 05	Built structure	Section 35	High significance – Grade III-B	Medium (48) Low (20)	(1) Avoid / (2) excavate archaeologically
Buffelsfontein					
Bu 05	Adit	Section 34	Low significance – Grade IV-C	Medium (48) Low (20)	(4) Considered documented in full
Desire					
DS 01	Adit	Section 34	Low significance – Grade IV-C	Medium (48) Low (20)	(4) Considered documented in full

For the current study, the following mitigation measures are proposed, to be implemented only if any of the identified sites or features are to be impacted on by the proposed mining activities:

Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

- (1) Avoidance: This is viewed to be the primary form of mitigation. The site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall). Depending on the type of site, the buffer zone can vary from
 - 5 metres for a single grave, to
 - 50 metres where the boundaries are less obvious, e.g. a Late Iron Age site.
- (2) Archaeological investigation: This option can be implemented with additional design and construction inputs. Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist.
 - This option should be implemented when it is impossible to avoid impacting on an identified site or feature.
 - This also applies for graves older than 60 years that are to be relocated. For graves younger than 60 years a permit from SAHRA is not required. However, all other legal requirements has to be adhered to.
 - Impacts can be beneficial – e.g. mitigation contribute to knowledge.
- (3) Rehabilitation: When features, e.g. buildings or other structures, e.g. bridges, are to be re-used. Conservation measures would be to record the buildings/structures as they are (at a particular point in time). The records and recordings would then become the 'artefacts' to be preserved and managed as heritage features or (movable) objects.
 - It is recommended that detail plan drawings are made (if the originals cannot be located in the TGME archive) and that the current situation is photographed in detail.
 - This approach automatically also leads to the enhancement of the sites or features that are re-used.
- (4) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report.

8.5 Alternatives considered

In terms of knowledge and understanding of the immediate heritage landscape, sites and features in the region, the potential sources of risk would be the same for any alternative located within a reasonable distance of the original development site.

9. MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

9.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities.

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

9.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

10. CONCLUSION AND RECOMMENDATIONS

Transvaal Gold Mining Estates Limited (TGME), Mpumalanga Province, is applying to rework Pre-Mined Residue (PMR) mines in the Pilgrims Rest area, which will form part of a larger project named the TGME Mine Development project (Project 10167). Stonewall Mining(Pty) Limited (SWM) owns the company "Transvaal Gold Mining Estates Limited (TGME)" to which these Mining and also prospecting rights were granted and executed and registered.

The cultural landscape qualities of the region essentially consist of two components. The first is made up of a limited pre-colonial (Stone Age and Iron Age) occupation. The second component is a rural area in which the human occupation consists of two elements. The discovery of gold during the late 19th century resulted in a flood of people entering the area, establishing gold mining activities all over the landscape. The second element is a rural farming community, which, since the early 20th century revolved around forestry, which

altered the landscape beyond recognition. These two elements led to the establishment of a number of smaller towns in the region, all which are now part of an ongoing tourism industry.
Identified heritage sites and proposed mitigation measures

Heritage impacts are categorised as:

- Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries;
- Indirect impacts, e.g. restriction of access or visual intrusion concerning the broader environment;
- Cumulative impacts that are combinations of the above.

Impacts can be managed through one or a combination of the following measures:

- Mitigation
- Avoidance
- Compensation
- Enhancement (positive impacts)
- Rehabilitation
- Interpretation
- Memorialisation

For the current study, the following mitigation measures are proposed, to be implemented only if any of the identified sites or features are to be impacted on by the proposed mining activities:

Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

- (1) Avoidance: This is viewed to be the primary form of mitigation. The site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall). Depending on the type of site, the buffer zone can vary from
 - 5 metres for a single grave, to
 - 50 metres where the boundaries are less obvious, e.g. a Late Iron Age site.
- (2) Archaeological investigation: This option can be implemented with additional design and construction inputs. Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist.
 - This option should be implemented when it is impossible to avoid impacting on an identified site or feature.
 - This also applies for graves older than 60 years that are to be relocated. For graves younger than 60 years a permit from SAHRA is not required. However, all other legal requirements has to be adhered to.
 - Impacts can be beneficial – e.g. mitigation contribute to knowledge.
- (3) Rehabilitation: When features, e.g. buildings or other structures, e.g. bridges, are to be re-used. Conservation measures would be to record the buildings/structures as they are (at a particular point in time). The records and recordings would then become the 'artefacts' to be preserved and managed as heritage features or (movable) objects.
 - It is recommended that detail plan drawings are made (if the originals cannot be located in the TGME archive) and that the current situation is photographed in detail.
 - This approach automatically also leads to the enhancement of the sites or features that are re-used.

- (4) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report.

IDENTIFIED HERITAGE RESOURCES					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After	Proposed mitigation (Refer to definitions above)
Vaalhoek					
Vh 01	Mine structure	Section 34	High significance – Grade III-B	Medium (48) Low (24)	(2) Document site / (3) Rehabilitate buildings for re-use
Vh 02	Mine structure	Section 34	Medium significance – Grade IV-B	Medium (48) Low (24)	(2) Document site
Vh 03	Grave	Section 36	Medium significance – Grade IV-A	Low (20) Low (20)	(1) Avoid – fence off
Willemsoord					
Wo 01	Homestead	Section 34	Medium significance – Grade IV-B	Medium (48) Low (20)	(1) Avoid / (2) excavate archaeologically
Wo 01	Power line	Section 34	High significance – Grade III-B	Low (20) Low (20)	(1) Avoid
Willemsoord West					
WoW 01	Farmstead	Section 34	Medium significance – Grade IV-C	Low (20) Low (20)	(1) Avoid / (2) excavate archaeologically
WoW 02	Iron Age settlement	Section 35	High significance – Grade III-B	Low (20) Low (20)	(1) Avoid / (2) excavate archaeologically
Bourke's Luck					
BL 01	Adit	Section 34	Low significance – Grade IV-C	Medium (48) Low (20)	(4) Considered documented in full
BL 02a	Homestead	Section 34	High significance – Grade III-B	Medium (48) Low (20)	(1) Avoid / (2) excavate archaeologically
BL 02b	Burial site	Section 36	Medium significance – Grade IV-C	Medium (48) Low (20)	(1) Avoid / (2) excavate archaeologically
BL 03	Burial site	Section 36	High significance – Grade III-B	Low (20) Low (20)	(1) Avoid / (2) excavate archaeologically
BL 04	Power line	Section 34	High significance – Grade III-B	Low (20) Low (20)	(1) Avoid / (2) excavate archaeologically
BL 05	Built structure	Section 35	High significance – Grade III-B	Medium (48) Low (20)	(1) Avoid / (2) excavate archaeologically
Buffelsfontein					
Bu 05	Adit	Section 34	Low significance – Grade IV-C	Medium (48) Low (20)	(4) Considered documented in full
Desire					
DS 01	Adit	Section 34	Low significance – Grade IV-C	Medium (48) Low (20)	(4) Considered documented in full

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view it is recommended that the proposed development be allowed to continue on acceptance of the proposed mitigation measures.

Conditions for inclusion in the environmental authorisation:

- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- Copies of all mitigation work done as a result of this or other developments undertaken by Stonewall Mining (TGME), should be incorporated into the central TGME archive for safekeeping.

11. REFERENCES

11.1 Data bases

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Environmental Potential Atlas, Department of Environmental Affairs and Tourism.
Heritage Atlas Database, Pretoria
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SAHRA Archaeology and Palaeontology Report Mapping Project (2009)
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11.2 Literature

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Verster, D. 2017. *Proposed "TGME mine development project (10167)": Gold Mining Projects in terms of pre-mined residue and hard rock mining, near Pilgrim's Rest, Mpumalanga Province: Comments and Response report as part of the final scoping report*. Unpublished report: Batho Earth Social and Environmental Consultants.

Ward, J.H.W and Wilson, M.G.C 1998. Gold outside the Witwatersrand Basin. Wilson, M.G.C. & Anhaeusser, C.R. (eds) *The Mineral Resources of South Africa*. Handbook 16. Pretoria: Council for Geoscience. Pp. 350 – 387.

11.3 Maps and aerial photographs

1: 50 000 Topocadastral maps

Google Earth

A.L Neale: Map of Portion of the Lydenburg District, 1904

11.4 Interviews

- Ms C van Wyk-Rowe, former curator of the Pilgrim's Rest Museum and acknowledged expert on the prehistory and history of the larger region – 06/10/2017.
- Mr J Fourie, Strategic Planning & Environmental Advisor, Stonewall Mining – 06/10/2017.

APPENDIX 1. INDEMNITY AND TERMS OF USE OF THIS REPORT

The findings, results, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and the author reserve the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. The author of this report will not be held liable for such oversights or for costs incurred as a result of such oversights.

Although the author exercises due care and diligence in rendering services and preparing documents, he accepts no liability and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of the information contained in this document.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this 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.

APPENDIX 2. SPECIALIST COMPETENCYJohan (Johnny) van Schalkwyk

J A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 40 years. Originally based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape, Northern Cape, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 70 papers, most in scientifically accredited journals. During this period he has done more than 2000 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, roads, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.

A complete *curriculum vitae* can be supplied on request.

APPENDIX 3. CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE RESOURCES

A system for site grading was established by the NHRA and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

Significance

According to the NHRA, Section 2(vi) the **significance** of a heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. SITE EVALUATION				
1.1 Historic value				
Is it important in the community, or pattern of history				
Does it have strong or special association with the life or work of a person, group or organisation of importance in history				
Does it have significance relating to the history of slavery				
1.2 Aesthetic value				
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group				
1.3 Scientific value				
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage				
Is it important in demonstrating a high degree of creative or technical achievement at a particular period				
1.4 Social value				
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons				
1.5 Rarity				
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage				
1.6 Representivity				
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects				
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class				
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.				
2. Sphere of Significance		High	Medium	Low
International				
National				
Provincial				
Regional				
Local				
Specific community				
3. Field Register Rating				
1.	National/Grade 1: High significance - No alteration whatsoever without permit from SAHRA			
2.	Provincial/Grade 2: High significance - No alteration whatsoever without			

	permit from provincial heritage authority.	
3.	Local/Grade 3A: High significance - Mitigation as part of development process not advised.	
4.	Local/Grade 3B: High significance - Could be mitigated and (part) retained as heritage register site	
5.	Generally protected A: High/medium significance - Should be mitigated before destruction	
6.	Generally protected B: Medium significance - Should be recorded before destruction	
7.	Generally protected C: Low significance - Requires no further recording before destruction	

APPENDIX 4. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority-

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

In terms of cemeteries and graves the following (Section 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) 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.

The National Heritage Resources Act (Act no 25 of 1999) stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I:** Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II:** Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III:** Other heritage resources worthy of conservation, and which prescribes heritage resources assessment criteria, consistent with the criteria set out in section 3(3), which must be used by a heritage resources authority or a local authority to assess the intrinsic, comparative and contextual significance of a heritage resource and the relative benefits and costs of its protection, so that the appropriate level of grading of the resource and the consequent responsibility for its management may be allocated in terms of section 8.

Presenting archaeological sites as part of tourism attraction requires, in terms 44 of the Act, a Conservation Management Plan as well as a permit from SAHRA.

(1) Heritage resources authorities and local authorities must, wherever appropriate, co-ordinate and promote the presentation and use of places of cultural significance and heritage resources which form part of the national estate and for which they are responsible in terms of section 5 for public enjoyment, education, research and tourism, including-

- (a) the erection of explanatory plaques and interpretive facilities, including interpretive centres and visitor facilities;
- (b) the training and provision of guides;
- (c) the mounting of exhibitions;
- (d) the erection of memorials; and
- (e) any other means necessary for the effective presentation of the national estate.

(2) Where a heritage resource which is formally protected in terms of Part I of this Chapter is to be presented, the person wishing to undertake such presentation must, at least 60 days prior to the institution of interpretive measures or manufacture of associated material, consult with the heritage resources authority which is responsible for the protection of such heritage resource regarding the contents of interpretive material or programmes.

(3) A person may only erect a plaque or other permanent display or structure associated with such presentation in the vicinity of a place protected in terms of this Act in consultation with the heritage resources authority responsible for the protection of the place.

APPENDIX 5. RELOCATION OF GRAVES

If the graves are younger than 60 years, an undertaker can be contracted to deal with the exhumation and reburial. This will include public participation, organising cemeteries, coffins, etc. They need permits and have their own requirements that must be adhered to.

If the graves are older than 60 years old or of undetermined age, an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. This is a requirement by law.

Once it has been decided to relocate particular graves, the following steps should be taken:

- Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law.
- Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law.
- Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.
- During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a requirement by law.
- Once the 60 days has passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been received, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any items found in the grave.

Information needed for the SAHRA permit application

- The permit application needs to be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.
- If graves have not been identified and there are no headstones to indicate the grave, these are then unknown graves and should be handled as if they are older than 60 years. This information also needs to be given to SAHRA.
- A letter from the landowner giving permission to the developer to exhume and relocate the graves.
- A letter from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

APPENDIX 6. PUBLIC PARTICIPATION

The following was taken from the Final Draft Scoping report (Verster 2017):

4.6 Heritage Impacts

NO.	THEME: Heritage			
	ISSUE RAISED	DATE	COMMENTATOR	RESPONSE
4.6.1	There are various gravesites in the area that need to be protected.	04 May Minutes of Meeting held with the Motlatse Economic Development Cooperative.	Mr. Jacob Marule: Member: Motlatse Economic Development Cooperative.	During the detailed EIA, a Heritage Impact Assessment would be conducted which would attend to the location and conservation of gravesites. It would be beneficial if the archaeologist appointed would consult with the members of the Cooperative in this regard.

APPENDIX 7. INVENTORY OF IDENTIFIED CULTURAL HERITAGE SITES

1. Vaalhoek

Project description: Vaalhoek Loading Site/Shaft Head	
Description	Development of gold mining activities
Project name	TGME Mine Development Project (10167): Vaalhoek

Property details						
Province	Mpumalanga					
Magisterial district	Pilgrims Rest 2					
Local municipality	Thaba Chweu					
Topo-cadastral map	2430DB					
Farm name	Vaalhoek 474KT, Sacramento Creek 492KT, Klondyke 493KT, Hermansburg 495KT, Manx 475KT, Willemsoord 476KT					
Closest town	Graskop					
Coordinates	Centre point (approximately)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	-24.74184	30.77603			

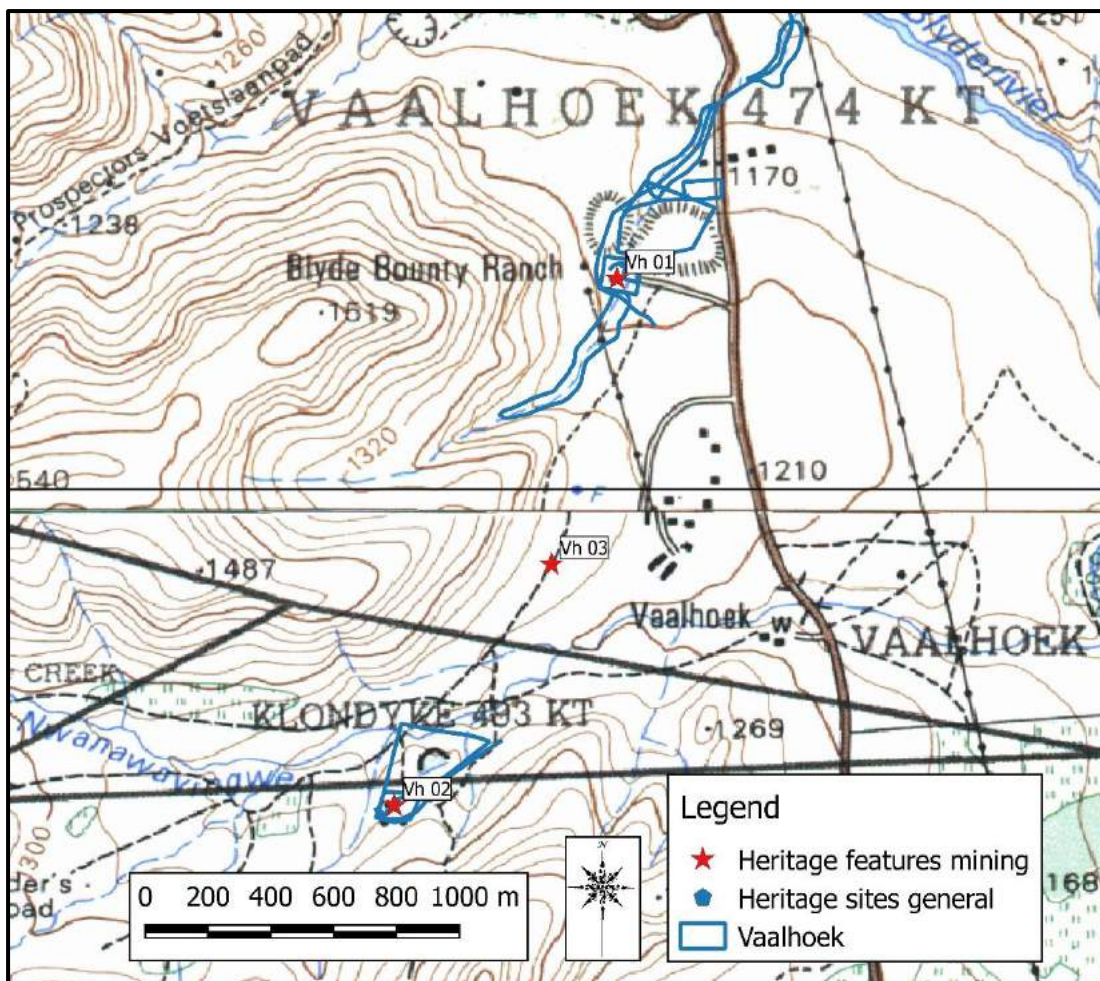
Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq 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	No
Any other development category, public open space, squares, parks, recreation grounds	No


Land use	
Previous land use	Farming/Gold mining
Current land use	Farming

Mine plan
<ul style="list-style-type: none"> • Underground & open cast mining sections • Entrance into Vaalhoek U/G mine from Vaalhoek farm <ul style="list-style-type: none"> ○ Vertical Shafts #1 & # 2 • U/G workings extend sub-surface on Klondyke, Sacramento Creek, Hermansburg, Manx and Willemsoord farms • Open cast sections called “Thelma Reef” on Vaalhoek farm



General views over the Vaalhoek study area.



No.: Vh 01	Vaalhoek 1 Shaft
Name: Mine complex NHRA Category: Structures older than 60 years - Section 34 Farm: Willemsoord 476KT Coordinates: -24,74337, 30.77481	

Description
 Remains of the old Vaalhoek mine. Existing buildings were used as offices, power plant and store rooms. Old mine infrastructure as well as an old waste-rock dump occur on the site. Based on dates on machinery in the power plant, it was still in use in 1985, although the mine seems to date to much earlier.



Significance of site/feature | High significance – Grade III-B
Reasoned opinion: Although the integrity of this site has been compromised by the removal (legally) of all mining equipment, the original buildings are all intact and probably represents a last example of the smaller (contra Pilgrim's Rest) mining operations in the region.

Impact assessment
 It is proposed that the new mining activities will be located on the same site as the original vertical shaft will be opened again. The existing buildings will be restored and re-used. The waste rock dump will be rehabilitated. All of this will have an impact on the remaining features.

Significance of impact: before/after mitigation					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	6	4	48	Medium
1	5	6	2	24	Low

Mitigation
 It is recommended that detail plan drawings are made (if the originals cannot be located in the TGME archive) and that the current situation is photographed in detail. The existing buildings are to be restored only under the supervision and guidance of a conservation architect.

Requirements
 Conservation by local authority, no external alteration without permit from provincial heritage authority. Could be mitigated and (part) retained as heritage register site.

- Destruction permit required from provincial heritage authority/Restoration permit required from provincial heritage authority.

References

Fowler 1968

No.: Vh Mine 02	Vaalhoek 2 Shaft
Name: Mine complex NHRA Category: Structures older than 60 years - Section 34 Farm: Hermansburg 495KT Coordinates: -24,75996, 30,76799	

Description

Remains of the old Vaalhoek (Hermansburg) mine. Existing buildings were used as offices, power plant and store rooms. Old mine infrastructure as well as an old waste-rock dump occur on the site.



Significance of site/feature | Medium significance – Grade IV-B

Reasoned opinion: The integrity of this site has already been impacted on by the removal (legally) of all mining equipment, vandalism and natural deterioration.

Impact assessment

It is proposed that the new mining activities will be located on the same site as the original vertical shaft will be opened again. The waste rock dump will be rehabilitated. All of this will have an impact on the remaining features.

Significance of impact: before/after mitigation

Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	6	4	48	Medium
1	5	6	2	24	Low

Mitigation

It is recommended that detail plan drawings are made (if the originals cannot be located in the TGME archive) and that the current situation is photographed in detail.


Requirements

Conservation by local authority. Site should be recorded before destruction.


- Destruction permit required from provincial heritage authority.

References

Fowler 1968

No.: Vh 03	Vaalhoek mine: Regional
Name: Burial site NHRA Category: Graves, cemeteries and burial grounds - Section 36 Farm: Vaalhoek 474KT Coordinates: -24,75236, 30.77296	

Description Single grave of Koko Mawela. The headstone has only recently been erected, but it does not indicate any dates pertaining to the deceased.

	
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Significance of site/feature	High/medium significance – Grade IV-A
Reasoned opinion: Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedure has been followed.	

Impact assessment
This site is not located inside the larger Vaalhoek area, but is included here as it is some distance (c. 30 m) from the possible access route to the mining area. It is indicated here as an area of sensitivity that should be red flagged for possible future development.

Significance of impact: before/after mitigation					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	4	2	20	Low
1	5	4	2	20	Low

Mitigation
It is recommended that the burial site should be avoided and fenced off with wire, leaving a buffer zone of at least five metres from the outer edges of the graves. If the area cannot be avoided, it is recommended that graves are relocated after the proper procedure has been followed – see Appendix 3.

Requirements
Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority. <ul style="list-style-type: none"> If the grave is older than 60 years, a valid permit for its relocation must be obtained from SAHRA. This is in addition to all other requirements – see Appendix 3.

References
-

2a. Willemsoord

Project description: Willemsoord Loading Site/Shaft Head	
Description	Development of gold mining activities
Project name	TGME Mine Development Project (10167): Willemsoord

Property details						
Province	Mpumalanga					
Magisterial district	Pilgrims Rest 2					
Local municipality	Thaba Chweu					
Topo-cadastral map	2430DB					
Farm name	Willemsoord 476KT					
Closest town	Graskop					
Coordinates	Centre point (approximately)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	-24.70429	30.80281			

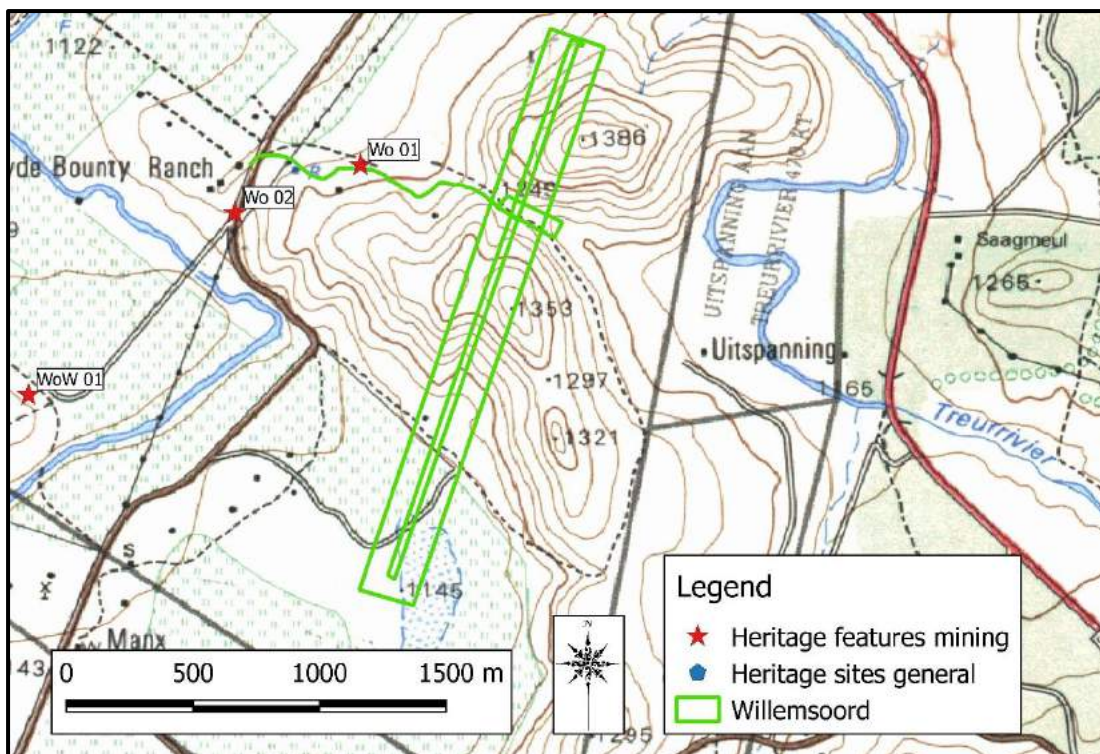
Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq 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	No
Any other development category, public open space, squares, parks, recreation grounds	No


Land use	
Previous land use	Farming/Gold mining
Current land use	Farming

Mine plan
<ul style="list-style-type: none"> • Underground mine • Entrance into Willemsoord U/G mine from Willemsoord farm <ul style="list-style-type: none"> ○ Vertical Shafts #1 & #2



General views over the Willemsoord study area.



No.: Wo 01	Willemsoord mine access road
Name: Homestead NHRA Category: Archaeological site or material - Section 34 Farm: Willemsoord 476KT Coordinates: -24,70050, 30.79727	

Description

What is identified as an old (farm-)labourer homestead. Only the foundations and low sections of the walls remain. The lower parts of the walls were constructed with stone, held together with clay. It is suspected that as the walls got higher, it was made with sundried bricks or according to the box-and-rammed earth technique. At least three different enclosures, or rooms, could be identified.



Significance of site/feature | Medium significance – Grade IV-B

Reasoned opinion: As their footprint are usually small, these are the typical features that are usually overlooked during any development.

Impact assessment

This site is located adjacent to the possible access road to the Willemsoord shaft head and might therefore be impacted on by the proposed development.

Significance of impact: before/after mitigation

Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	6	4	48	Medium
1	5	4	2	20	Low

Mitigation

It is recommended that the feature is avoided and fenced off with wire, leaving a buffer zone of at least five metres from the outer edges. If it cannot be avoided, it is recommended that the structure is investigated archeologically (excavated and documented).

Requirements

Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority.

- As the structure is probability older than 60 years, a valid permit for its destruction must be obtained from SAHRA. This will only be issued after the site has been fully documented archaeologically, for which a valid excavation permit from SAHRA is required.

References

-

No.: Wo 02	Willemsoord mine: regional
Name: Power line NHRA Category: Structures older than 60 years - Section 34 Farm: Willemsoord 476KT Coordinates: -24,70239, 30.79254	

Description
 Old electricity transmission line. Electricity was generated at a hydro-electricity plant located on the Blyde River and transmitted by means of this power line to Pilgrim's Rest. Most of the pylons are still intact and it seems as if the line is now used for a secondary purpose. The pylons are approximately 110 m (350 ft) apart, mounted on concrete plinths. Two sets of porcelain insulators, on different levels, indicate that two sets of wiring were used, in addition to an earth-wire.



Significance of site/feature | High significance – Grade III-B
Reasoned opinion: These are the typical features that are usually overlooked during any development. However, it represents technological innovation that played a cardinal role in the development of gold mining activities in the larger region.

Impact assessment
 This site is not located inside the Willemsoord mining operations area. It is however indicated here as an area of sensitivity that should be red flagged for possible future development.

Significance of impact: before/after mitigation					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	4	2	20	Low
1	5	4	2	20	Low

Mitigation
 Avoid feature over total length of power line.

Requirements
 Conservation by local authority, no external alteration without permit from provincial heritage authority. Could be mitigated and (part) retained as heritage register site.

References
 1: 50 000 topocadastral map

2b. Willemsoord West

Project description: Willemsoord West Loading Site/Shaft Head	
Description	Development of gold mining activities
Project name	TGME Mine Development Project (10167): Willemsoord West

Property details						
Province	Mpumalanga					
Magisterial district	Pilgrims Rest 2					
Local municipality	Thaba Chweu					
Topo-cadastral map	2430DB					
Farm name	Willemsoord 476KT, Manx 475KT					
Closest town	Graskop					
Coordinates	Centre point (approximately)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	-24.71158	30.78126			

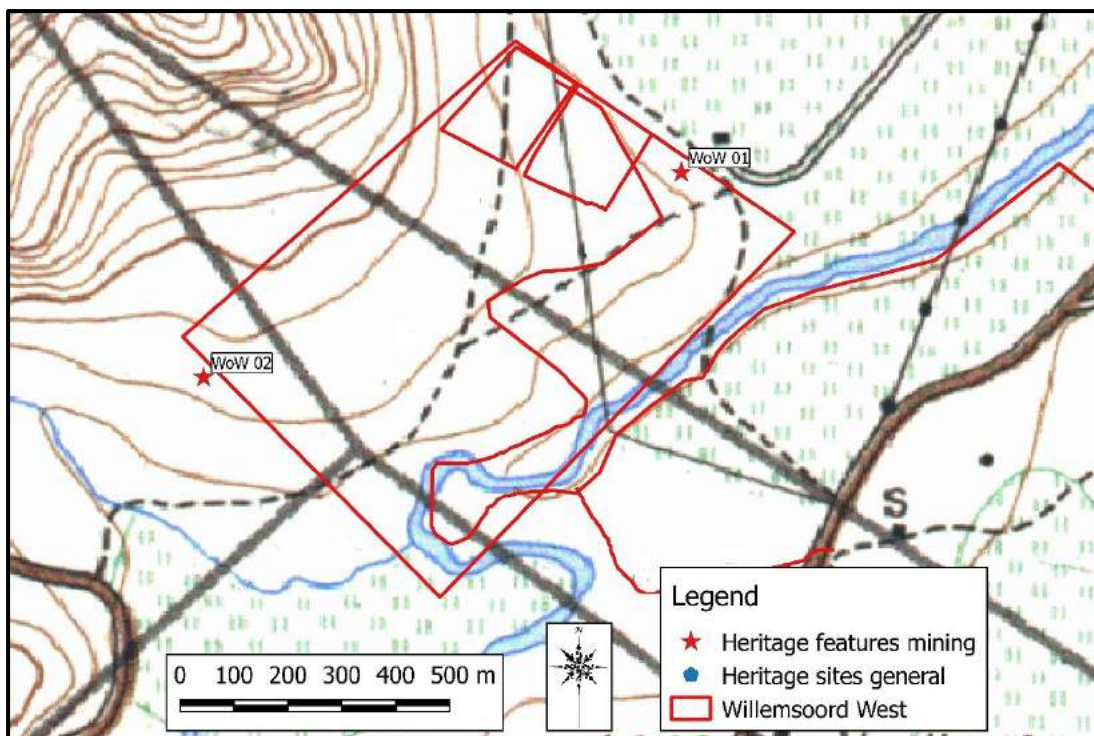
Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq 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	No
Any other development category, public open space, squares, parks, recreation grounds	No


Land use	
Previous land use	Farming/Gold mining
Current land use	Farming

Mine plan
<ul style="list-style-type: none"> • Underground mine • Entrance into Willemsoord U/G mine from Willemsoord farm <ul style="list-style-type: none"> ○ Vertical Shafts #1 & #2



General views of the Willemsoord West study area.



No.: WoW 01	Willemsoord West Head and Rock Loading
Name: Farmstead NHRA Category: Archaeological site or material - Section 34 Farm: Willemsoord 476KT Coordinates: -24,70947, 30.78402	

Description
 The old house at the farmstead. The house seems to date to the recent past, which is confirmed by the modern materials used in its construction and for the fittings. According to Google Earth images, the structure was still complete, with roof and all in 2013, but in 2017 during the site visit it was already in ruins, with the roof and all other fittings removed. The garden consists of exotic plants and trees and an elaborate water feature occurred in the front garden.



Significance of site/feature | Low significance – Grade IV-C
Reasoned opinion: This feature is not very old, does not exhibit any unique architectural features and its integrity has been compromised due to vandalism and the removal of all fixtures.

Impact assessment
 This site is not located inside the Willemsoord mining operations area. It is however indicated here as an area of sensitivity that should be red flagged for possible future development.

Significance of impact: before/after mitigation					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	4	2	20	Low
1	5	4	2	20	Low

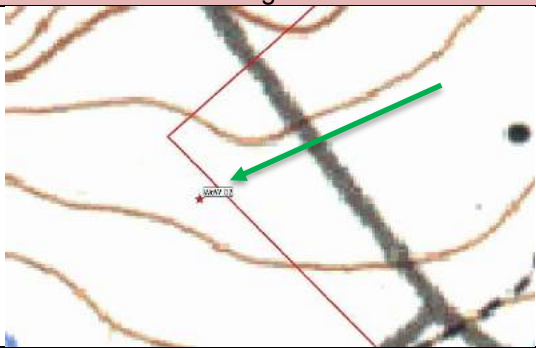
Mitigation
 It is recommended that it is viewed to be fully documented after inclusion in this report. The building is structurally still in a good condition and it would be possible to fix it and re-use it for offices, etc. for the mine.

Requirements
 Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit required from provincial heritage authority.

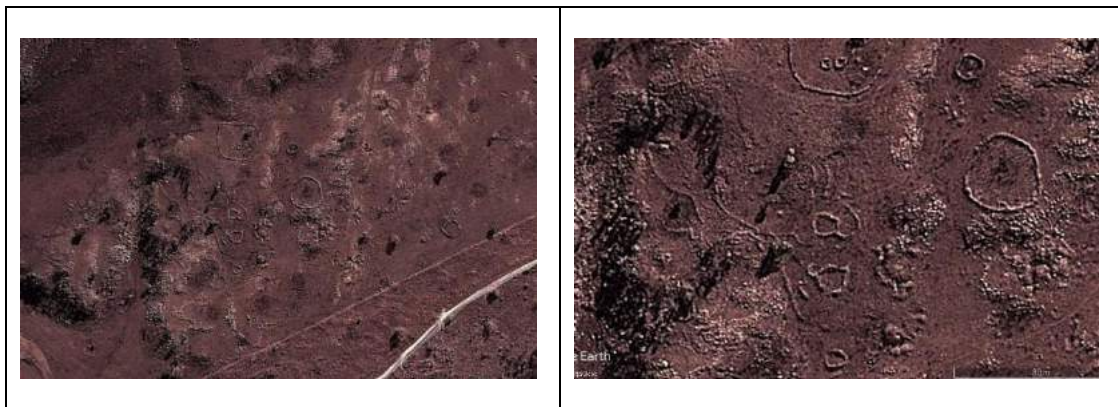
- As the integrity of the structure has been compromised, it is recommended that it is viewed to be fully documented after inclusion in this report.

References

1:50 000 topocadastral map; Google Earth

No.: WoW 02	Willemsoord West Region
Name: Iron Age Settlement site NHRA Category: Archaeological site or material - Section 35 Farm: Willemsoord 476KT Coordinates: -24,71321, 30.77555	

Description
 Typical Late Iron Age stone walled settlement that can be linked with the Koni group of people that settled in the larger Mpumalanga region from c. 1600 onwards. The site covers an area of c. 340 x 240 m. This feature has been identified at desktop level by means of Google Earth.



Significance of site/feature | High significance – Grade III-B
Reasoned opinion: Very little is known about the Late Iron Age settlement of the larger region and, according to available evidence this is one of the first reports on the occurrence of such sites here.

Impact assessment
 This site is not located inside the Willemsoord mining operations area. It is however indicated here as an area of sensitivity that should be red flagged for possible future development.

Significance of impact: before/after mitigation					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	4	2	20	Low
1	5	4	2	20	Low

Mitigation
 It is recommended that the feature is avoided. The boundaries of the site should be pointed out by a qualified archaeologist with a suitable buffer zone around it. If the site cannot be avoided, it should be investigated archaeologically (mapping, excavation, documentation) by a suitably qualified archaeologist.

Requirements
 Conservation by local authority, no external alteration without permit from provincial heritage authority. Could be mitigated and (part) retained as heritage register site.

- A valid permit for its destruction must be obtained from SAHRA. This will only be issued after the site has been fully documented archaeologically, for which a valid excavation

permit from SAHRA is required.

References

Google Earth

3. Bourke's Luck

Project description: Bourke's Luck Mine North	
Description	Development of gold mining activities
Project name	TGME Mine Development Project (10167): Bourke's Luck

Property details						
Province	Mpumalanga					
Magisterial district	Pilgrims Rest 2					
Local municipality	Thaba Chweu					
Topo-cadastral map	2430DB					
Farm name	Bourke's Luck 454KT; Willemsoord 476KT					
Closest town	Graskop					
Coordinates	Centre point (approximately)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	-24.68341	30.80989			

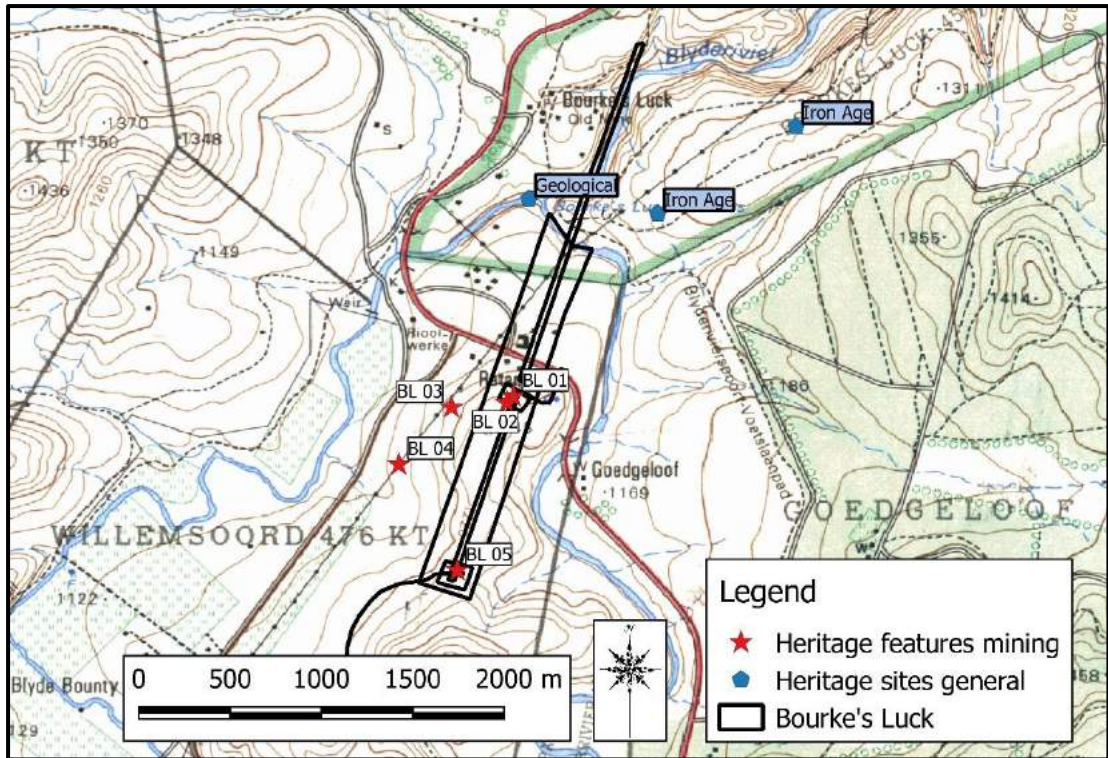
Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq 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	No
Any other development category, public open space, squares, parks, recreation grounds	No


Land use	
Previous land use	Farming/Gold mining
Current land use	Farming

Mine plan
<ul style="list-style-type: none"> Underground mine Entrance into Bourke's Luck U/G mine from Willemsoord Farm



General views over the Bourke's Luck study area.



No.: BL 01	Bourke's Luck Loading Site/Shaft Head
Name: Mining adit NHRA Category: Structures older than 60 years - Section 34 Farm: Willemsoord 476KT Coordinates: -24,68489, 30.80969	

Description Old mine adit, much overgrown with vegetation. It is essentially a trench excavated into the side of a hill and is approximately 40 x 5 metres in size. No secondary or support structures could be identified in- or outside the excavated area. Its date of operation could not be established.



Significance of site/feature	Low significance – Grade IV-C
Reasoned opinion: There are literally thousands such features in the larger environment, making the conservation of a single example unnecessary.	

Impact assessment
This site is located inside the Bourke's Luck Loading Site/Shaft Head and it would probably be used during the new mining operations.

Significance of impact					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	6	4	48	Medium
1	5	6	2	24	Low

Mitigation
As no secondary features or structures could be associated with this site, it is recommended that it is viewed to be fully documented after inclusion in this report.

Requirements
Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit required from provincial heritage authority.

References
Fowler 1968

No.: BL 02a	Bourke's Luck Loading Site/Shaft Head
Name: Homestead NHRA Category: Archaeological site or material - Section 34 Farm: Willemsoord 476KT Coordinates: -24,68525, 30.80929	

Description
<p>What is identified as an old (farm-)labourer homestead. Only the foundations and low sections of the walls remain. The lower parts of the walls were constructed with stone, held together with clay. It is suspected that as the walls got higher, it was made with sundried bricks or according to the box-and-rammed earth technique. Although the remains of some modern-day artefacts, i.e. pieces of glass, ceramics and metal are found all over, it is difficult to determine if it related to the site, or if it dates to a later period as some other activities were noticed in the larger region. A well-used, complete lower grinding stone was also noted.</p> <p>This feature is linked to the burials described in the next record.</p>



Significance of site/feature	High/medium significance – Grade IV-A
Reasoned opinion: As their footprint are usually small, these are the typical features that are usually overlooked during any development.	

Impact assessment
This site is located inside the Loading Site/Shaft Head area and would therefore be impacted on by the proposed development.

Significance of impact					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	6	4	48	Medium
1	5	6	2	24	Low

Mitigation
<p>It is recommended that the homestead site, including the graves (see below), be avoided and fenced off with wire, leaving a buffer zone of at least five metres from the outer edges of the homestead/graves. If the area cannot be avoided, it is recommended that the homestead is investigated archeologically (excavated and documented) and that the graves are relocated after the proper procedure has been followed – see Appendix 3.</p>

Requirements

Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority.

- As the homestead is probably older than 60 years, a valid permit for its destruction must be obtained from SAHRA. This will only be issued after the site has been fully documented archaeologically, for which a valid excavation permit from SAHRA is required.

References

-

No.: BL 02b	Bourke's Luck Loading Site/Shaft Head
Name: Burial site NHRA Category: Graves, cemeteries and burial grounds - Section 36 Farm: Willemsoord 476KT Coordinates: -24,68526, 30.80931	

<p>Description</p> <p>Approximately 7 graves adjacent to an old homestead. Only one grave has a headstone, with a name (Eleke Malele) and no date. The other graves are all marked with stone cairns. It is possible that all these graves related to the homestead described in the previous document, above.</p>



Significance of site/feature	High/medium significance – Grade IV-A
Reasoned opinion:	Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedure has been followed.

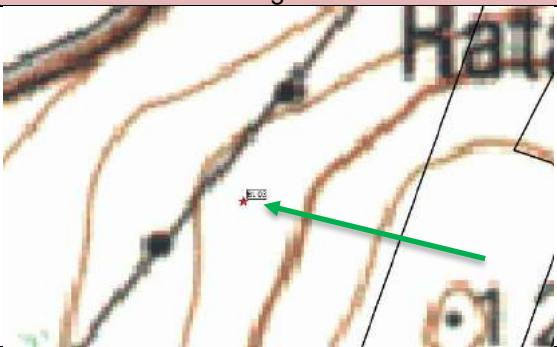
<p>Impact assessment</p> <p>This site is located inside the Bourke's Luck Loading Site/Shaft Head and it would probably be impacted on during the mining activities.</p>

Significance of impact					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	6	4	48	Medium
1	5	6	2	24	Low

<p>Mitigation</p> <p>It is recommended that the burial site, including the homestead (see above), be avoided and fenced off with wire, leaving a buffer zone of at least five metres from the outer edges of the homestead/graves. If the area cannot be avoided, it is recommended that the homestead is investigated archeologically (excavated and documented) and that the graves are relocated after the proper procedure has been followed – see Appendix 3.</p>

<p>Requirements</p> <p>Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority.</p> <ul style="list-style-type: none"> As some of the (unmarked) graves might be older than 60 years, a valid permit for their relocation must be obtained from SAHRA. This is in addition to all other requirements – see Appendix 3.

<p>References</p> <p>1: 50 000 topocadastral map</p>

No.: BL 03	Bourke's Luck Mine: Regional
<p>Name: Burial site NHRA Category: Graves, cemeteries and burial grounds - Section 36 Farm: Willemsoord 476KT Coordinates: -24,68546, 30.80633</p>	

Description
 What seems to be a formal burial site with an unknown number of graves. This feature has been identified at desktop level by means of Google Earth.



Significance of site/feature | High/medium local significance – Grade IV-A
Reasoned opinion: Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedure has been followed.

Impact assessment
 This site is not located inside the larger Bourke's Luck mining operations areas. It is however indicated here as an area of sensitivity that should be red flagged for possible future development.


Significance of impact					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	4	2	20	Low
1	5	4	2	20	Low

Mitigation
 It is recommended that the burial site should be avoided and fenced off with wire, leaving a buffer zone of at least five metres from the outer edges of the graves. If the area cannot be avoided, it is recommended that graves are relocated after the proper procedure has been followed – see Appendix 3.

Requirements
 Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority.

- If the graves are older than 60 years, a valid permit for their relocation must be obtained from SAHRA. This is in addition to all other requirements – see Appendix 3.

References
 Google Earth

No.: BL 04	Bourke's Luck Mine: Regional
Name: Power line NHRA Category: Structures older than 60 years - Section 34 Farm: Willemsoord 476KT Coordinates: -24,68525, 30.80929	

Description
 Old electricity transmission line. Electricity was generated at a hydro-electricity plant located on the Blyde River and transmitted by means of this power line to Pilgrim's Rest. Most of the pylons are still intact and it seems as if the line is now used for a secondary purpose. The pylons are approximately 110 m (350 ft) apart, mounted on concrete plinths. Two sets of porcelain insulators, on different levels, indicate that two sets of wiring were used, in addition to an earth-wire.



Significance of site/feature | High significance – Grade III-B
Reasoned opinion: These are the typical features that are usually overlooked during any development. However, it represents technological innovation that played a cardinal role in the development of gold mining activities in the larger region.

Impact assessment
 This site is not located inside the Bourke's Luck mining operations areas. It is however indicated here as an area of sensitivity that should be red flagged for possible future development.

Significance of impact					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	4	2	20	Low
1	5	6	2	20	Low

Mitigation
 Avoid feature over total length.

Requirements
 Conservation by local authority, no external alteration without permit from provincial heritage authority. Could be mitigated and (part) retained as heritage register site.

References
 1: 50 000 topocadastral map

No.: BL 05	Bourke's Luck Shaft Head
Name: Rectangular structure NHRA Category: Archaeological site or material - Section 35 Farm: Willemsoord 476KT Coordinates: -24,69431, 30.80663	

Description Rectangular structure of dry packed stone, approximately 8 x 5 m in size, with what seems to be an opening on the southern (uphill) side. Due to the dense vegetation cover it was nearly impossible to determine a specific function or if there are any other features in the immediate vicinity. It probably served as enclosure to keep stock such as cattle.



Significance of site/feature	Low significance – Grade IV-A
Reasoned opinion: As their footprint are usually small, these are the typical features that are usually overlooked during any development.	

Impact assessment This site is located inside the Bourke's Luck Shaft Head area and would therefore be impacted on by the proposed development. No other features could be detected in the immediate vicinity.
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Significance of impact					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	6	4	48	Medium
1	5	6	2	24	Low

Mitigation It is recommended that the feature is avoided and fenced off with wire, leaving a buffer zone of at least five metres from the outer edges. If it cannot be avoided, it is recommended that the structure is investigated archeologically (excavated and documented)

Requirements Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from provincial heritage authority. <ul style="list-style-type: none"> As the structure is probability older than 60 years, a valid permit for its destruction must be obtained from SAHRA. This will only be issued after the site has been fully documented archaeologically, for which a valid excavation permit from SAHRA is required.

References -

4. Buffelsfontein

Project description: Buffelsfontein Loading Site/Shaft Head	
Description	Development of gold mining activities
Project name	TGME Mine Development Project (10167): Buffelsfontein

Property details						
Province	Mpumalanga					
Magisterial district	Pilgrims Rest 2					
Local municipality	Thaba Chweu					
Topo-cadastral map	2430DA, 2430DB					
Farm name	Buffelsfontein 452KT; Granite Hill 477KT					
Closest town	Graskop					
Coordinates	Centre point (approximately)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	-24.68041	30.75211			

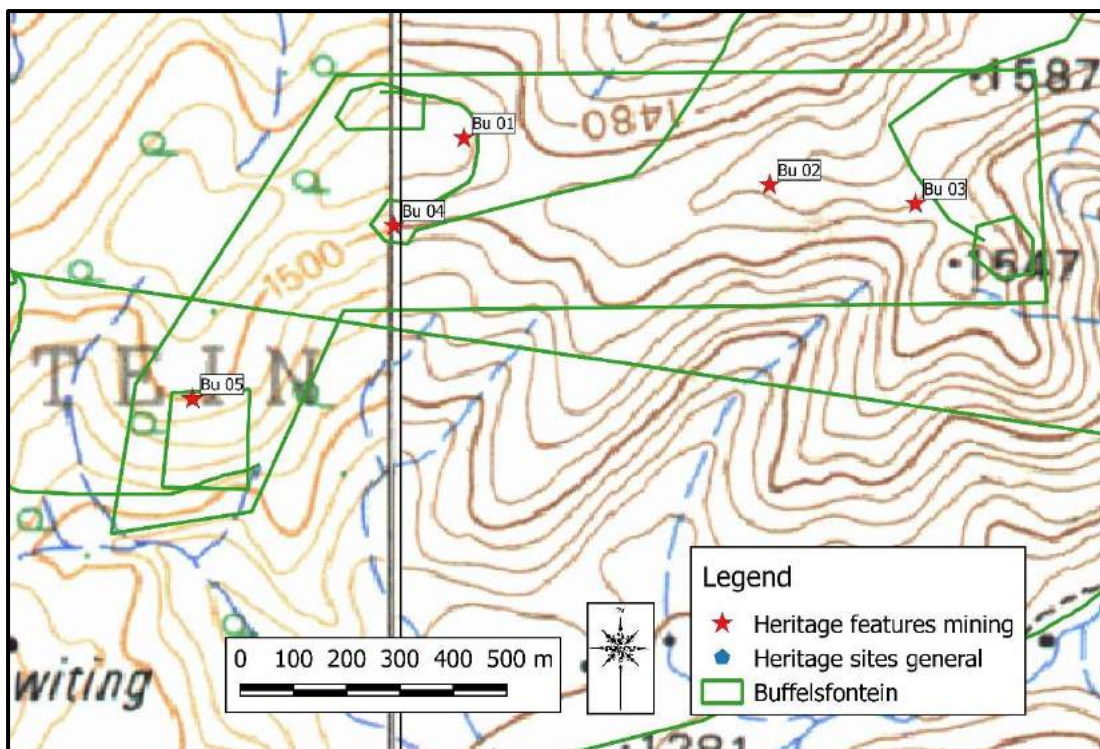
Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq 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	No
Any other development category, public open space, squares, parks, recreation grounds	No


Land use	
Previous land use	Farming/Gold mining
Current land use	Farming

Mine plan
<ul style="list-style-type: none"> • Underground mine • Entrance into Buffelsfontein U/G mine from Buffelsfontein farm <ul style="list-style-type: none"> ○ Historic adits • Extend U/G workings onto Granite Hill farm



General views over the Buffelsfontein study area.



No.: Bu 05	Buffelsfontein Head Infrastructure
<p>Name: Mining adit NHRA Category: Structures older than 60 years - Section 34 Farm: Buffelsfontein 452KT Coordinates: -24,68386, 30.74612</p>	

Description
<p>Old mine adit, much overgrown with vegetation. It is essentially a trench excavated into the side of a hill and is approximately 60 x 5 metres in size. No secondary or support structures could be identified in- or outside the excavated area. Its date of operation could not be established. It has recently been “re-opened” by illegal miners (colloquially referred to as <i>zama-zamas</i>).</p>



Significance of site/feature	Low significance – Grade IV-C
<p>Reasoned opinion: There are a number of old adits that have been identified in the larger Buffelsfontein study area. However, this is the only one which will directly be impacted on by the proposed mining activities.</p>	

Impact assessment
<p>This site is located inside the Buffelsfontein Loading Site/Shaft Head and it would probably be used during the new mining operations.</p>

Significance of impact					
Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	6	4	48	Medium
1	5	6	2	24	Low

Mitigation
<p>As no secondary features or structures could be associated with this site, it is recommended that it is viewed to be fully documented after inclusion in this report.</p>

Requirements
<p>Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit required from provincial heritage authority.</p>

References
-

5. Desire

Project description: Desire Loading Site/Shaft Head	
Description	Development of gold mining activities
Project name	TGME Mine Development Project (10167): Desire

Property details						
Province	Mpumalanga					
Magisterial district	Pilgrims Rest 2					
Local municipality	Thaba Chweu					
Topo-cadastral map	2430DD					
Farm name	Desire 563KT					
Closest town	Graskop					
Coordinates	Centre point (approximately)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	-24.93623	30.78494			

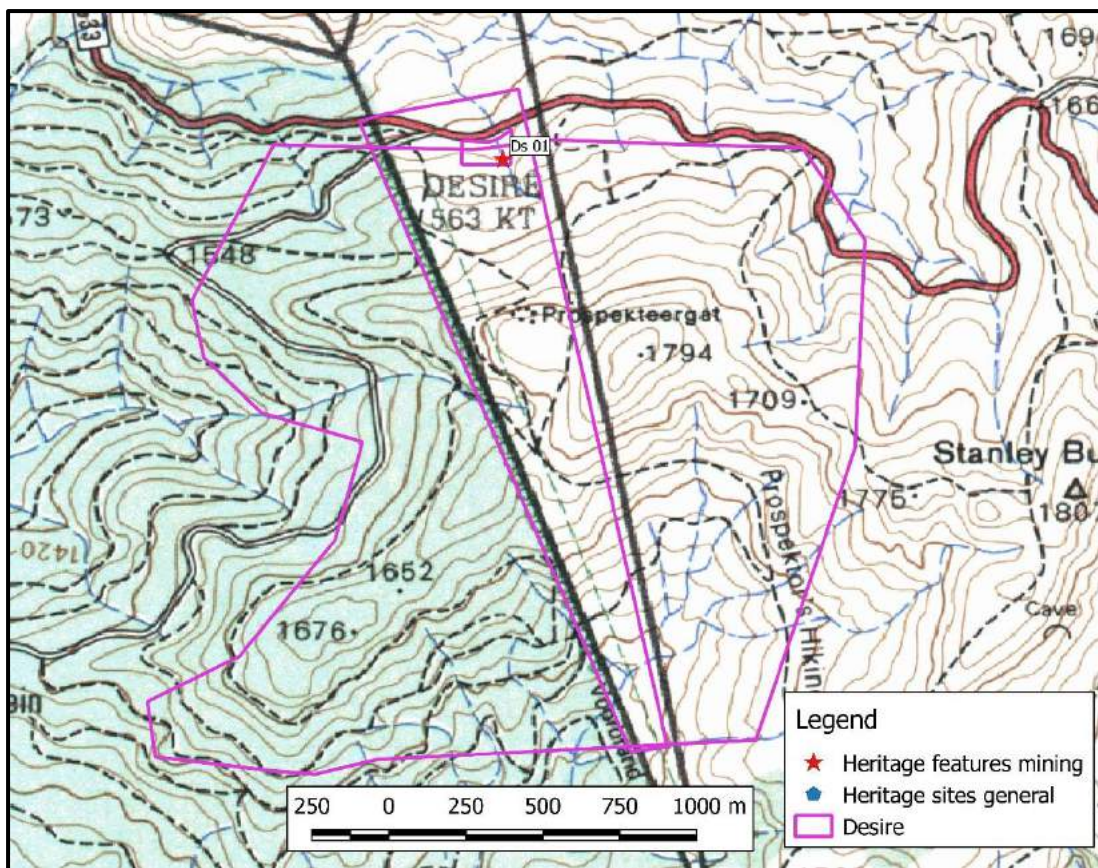
Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq 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	No
Any other development category, public open space, squares, parks, recreation grounds	No


Land use	
Previous land use	Farming/Gold mining
Current land use	Forestry

Mine plan
<ul style="list-style-type: none"> • Underground mining of Theta Reef <ul style="list-style-type: none"> ○ 2 x historical adits to be redeveloped



General views over the Desire study area.



No.: Ds 01	Desire Adit
Name: Mining adit NHRA Category: Structures older than 60 years - Section 34 Farm: Desire 563KT Coordinates: -24,92928, 30.78346	

Description
 Old mine adit, much overgrown with vegetation. It is essentially a tunnel excavated into the side of a hill. Currently, it is walled off, with an access door that has been welded shut. No secondary or support structures could be identified in- or outside the area. Its date of operation could not be established. Natural water seeping out from the tunnel is used by local people to do their washing with.



Significance of site/feature | Medium significance – Grade IV-B
Reasoned opinion: There are probably hundreds of similar old adits in the larger environment. However, this is the only one which will directly be impacted on by the proposed mining activities.

Impact assessment
 This feature is located inside the Desire adit site and it would probably be used during the new mining operations.

Significance of impact

Extent	Duration	Magnitude	Probability	Significance	Weight
1	5	6	4	48	Medium
1	5	6	2	24	Low

Mitigation
 Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit required from provincial heritage authority.

Requirements
 Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit required from provincial heritage authority.

References
 Fowler 1968