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AN UPDATED PHASE I HERITAGE IMPACT ASSESSMENT STUDY FOR THE UPGRADING OF BASE LINE INFORMATION AND FOR THE AMENDMENT OF THE ENVIRONMENTAL MANAGEMENT PROGRAM (EMP) FOR HERNIC BOKFONTEIN CHROME MINE NEAR MADIBENG IN THE NORTH-WEST PROVINCE OF SOUTH AFRICA

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ACRONYMS AND ABBREVIATIONS

AIA Archaeological Impact Assessment

ASAPA Association of South African Professional Archaeologists

CRM Cultural Resource Management

EAP Environmental Assessment Practitioner

ECO Environmental Control Officer

EIA Environmental Impact Assessment

EMP Environmental Management Plan

EPS Environmental Performance Standards

EIA Early Iron Age

ESA Early Stone Age

GPS Global Positioning System

HIA Heritage Impact Assessment

IEM Integrated Environmental Management

I & Aps Interested and Affected Parties

LIA Late Iron Age

LSA Late Stone Age

MIA Middle Iron Age

MPRDA Mineral and Petroleum Resources Development Act, 28 of 2002

MSA Middle Stone Age

NEMA National Environmental Management Act, 107 of 1998

NEMBA National Environmental Management: Biodiversity Act, 10 of 2004

NEMAQA National Environmental Management: Air Quality Act, 39 of 2004

NEMWA National Environmental Management: Waste Act, 59 of 2008

NHRA National Heritage Resources Act, 25 of 1999

NWA National Water Act, 36 of 1998

OSHA Occupational Health and Safety Act, 85 of 1993

PHRA Provincial Heritage Resource Agency

SAHRA South African Heritage Resources Agency

SAHRIS South African Heritage Resources Information System

ToR Terms of Reference

TERMINOLOGY

Terms that may be used in this report are briefly outlined below:

- Conservation: The act of maintaining all or part of a resource (whether renewable or non-renewable) in its present condition in order to provide for its continued or future use. Conservation includes sustainable use, protection, maintenance, rehabilitation, restoration and enhancement of the natural and cultural environment.

- Cultural resource management: A process that consists of a range of interventions and provides a framework for informed and value-based decision-making. It integrates professional, technical and administrative functions and interventions that impact on cultural resources. Activities include planning, policy development, monitoring and assessment, auditing, implementation, maintenance, communication, and many others. All these activities are (or will be) based on sound research.

- Cultural resources: A broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practice, belief or social interaction. They can be, but are not necessarily identified with defined locations.

- Heritage resources: The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources. Heritage resources (cultural resources) include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of

heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

- In-Situ Conservation: The conservation and maintenance of ecosystems, natural habitats and cultural resources in their natural and original surroundings.

- Iron Age: Refers to the last two millennia and 'Early Iron Age' to the first thousand years AD. 'Late Iron Age' refers to the period between the 16th century and the 19th century and can therefore include the Historical Period.

- Maintenance: Keeping something in good health or repair.

- Pre-historical: Refers to the time before any historical documents were written or any written language developed in a particular area or region of the world. The historical period and historical remains refer, for the Project Area, to the first appearance or use of 'modern' Western writing brought to the Eastern Highveld by the first Colonists who settled here from the 1840's onwards.

- Preservation: Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource.

- Recent past: Refers to the 20th century. Remains from this period are not necessarily older than sixty years and therefore may not qualify as archaeological or historical remains. Some of these remains, however, may be close to sixty years of age and may, in the near future, qualify as heritage resources.

- Protected area: A geographically defined area designated and managed to achieve specific conservation objectives. Protected areas are dedicated primarily to the protection and enjoyment of natural or cultural heritage, to

the maintenance of biodiversity, and to the maintenance of life-support systems. Various types of protected areas occur in South Africa.

- Reconstruction: Re-erecting a structure on its original site using original components.

- Replication: The act or process of reproducing by new construction the exact form and detail of a vanished building, structure, object, or a part thereof, as it appeared at a specific period.

- Restoration: Returning the existing fabric of a place to a known earlier state by removing additions or by reassembling existing components.

- Stone Age: Refers to the prehistoric past, although Late Stone Age people lived in South Africa well into the Historical Period. The Stone Age is divided into an Earlier Stone Age (3 million years to 150 000 thousand years ago) the Middle Stone Age (150 000 years to 40 000 years ago) and the Late Stone Age (40 000 years to 200 years ago).

- Sustainability: The ability of an activity to continue indefinitely, at current and projected levels, without depleting social, financial, physical and other resources required to produce the expected benefits.

- Translocation: Dismantling a structure and re-erecting it on a new site using original components.

- Project Area: refers to the area (footprint) where the developer wants to focus its development activities.

- Phase I studies refer to surveys using various sources of data in order to establish the presence of all possible types and ranges of heritage resources in any given Project Area (excluding paleontological remains as these studies are done by registered and accredited palaeontologists).

- Phase II studies include in-depth cultural heritage studies such as archaeological mapping, excavating and sometimes laboratory work. Phase II work may include the documenting of rock art, engraving or historical sites and dwellings; the sampling of archaeological sites or shipwrecks; extended excavations of archaeological sites; the exhumation of human remains and the relocation of graveyards, etc. Phase II work involves permitting processes, requires the input of different specialists and the co-operation and approval of the SAHRA.

EXECUTIVE SUMMARY

A HIA study done in September 2009 for the Hernic Bokfontein Mine revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999), namely, (Pistorius 2009):

- Stone walled settlements dating from the Late Iron Age (LIA).
- Graveyards.
- A Historical House.

An updated Phase I Heritage Impact Assessment (HIA) study as required in terms of Section 38 of the National Heritage Resources Act (No 25 of 1999) was done for Hernic Bokfontein on the farms Bokfontein 448, Uitvalgrond 416, Krokodildrift 446JQ and Boschfontein 448JQ to the north of the Magaliesberg in the North-West Province of South Africa.

The aims with this Phase I HIA study were the following:

- To establish whether any of the types and ranges of heritage resources (the 'national estate', see Box 1) as outlined in Section 3 of the National Heritage Resources Act (Act 25 of 1999) which were identified during a HIA study done in September 2009 still occur within the perimeters of the Hernic Bokfontein Mine and whether any new discovered heritage resources may exist.
- To confirm the significance of the heritage resources as was determined during the September 2009 heritage survey and to establish whether they will be affected by Hernic's proposed new mining activities and to establish the significance of any new heritage resources which may be discovered during this survey.
- To make recommendations regarding the mitigation or the conservation of any heritage resources that have been affected since a heritage survey was conducted in September 2009 or which may be affected by any new proposed mining activities.

The updated heritage survey done in August 2017 revealed no new heritage resources which may have been missed during the earlier survey. However, the survey pointed out that two stone walled sites (LIA04, LIA05) were destroyed by mining related activities,

probably sometime during the last three years, whilst the historical house (HH01) has largely fallen in disrepair.

The heritage resources identified during the 2009 and 2017 surveys were geo-referenced and mapped **(**Figure 4**;** Tables 1-3**).**

The significance of the heritage resources

The significance of the stone walled sites

These remains comprise archaeological remains which are older than sixty years and therefore are protected by the National Heritage Resources Act (No 25 of 1999).

The archaeological remains are rated as of high significance. This rating is based on the use of two rating (grading) schemes, namely:

- A scheme of criteria which outlines places and objects as part of the national estate as they have cultural-historical significance or other special value (outlined in Section 3 of the NHRA [Act No 25 of 1999] (see Box 1) (Table 4).
- A field rating scheme according to which heritage resources are graded in three tiers (levels) of significance based on the regional occurrence of heritage resources (Tables 4 & 5) (Section 7 of the NHRA [Act No 25 of 1999) (Table 5).

The significance of the historical house

The Historical House (HH01) is sixty years old, or is approaching this age. This structure therefore is protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999).

The significance of HH01 can further be scrutinised according to cultural and historical criteria such as the following: the cultural-historical background of this structure; its scientific or architectural value; its use in the field of tourism, museums or education as well as its aesthetic appearance; repeatability (scarcity), or its emotional (ideological) value.

According to these criteria the significance of HH01 can be rated as medium to high (Table 6).

The significance of the graveyards

Only GY01 has a bearing on this heritage report as GY02 occurs outside Hernic Bokfontein's mine premises and falls outside the mine's jurisdiction.

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (NHRA) (Act No 25 of 1999) in instances where graves are older than sixty years such as GY01.

Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the National Health Act, 2003 (Act No 61 of 2003), Municipal bylaws with regard to graves and graveyards may differ. Professionals involved with the exhumation and relocation of graves and graveyards must establish whether such bylaws exist and must adhere to these laws.

Significance of the impact on the heritage resources

The significance of the impact on the stone walled sites

The significance of impact on Site LIA01 is low as this site is located at a considerable distance from future mining activities.

The significance of impact on Site LIA04 and Site LIA05 was high as these sites were largely destroyed by mining activities.

The significance of impact of future mining on Site LIA02 and Site LIA03 will be high.

Possible future impact on the heritage resources

Hernic Bokfontein's propose expansion of mining activities will destroy Site LIA02 and Site LIA03.

The significance of the impact on the historical house

The significance of the impact on HH01 is high as the house has fallen into total disrepair.

Mitigating the heritage resources

Mitigating the stone walled sites

Site LIA01 will not be affected by the proposed new mining activities and therefore no mitigation measures are required.

Site LIA04 and Site LIA05 have largely been destroyed by mining activities. No mitigation measures are required. However, if any worth-while surface material still exists, e.g. diagnostic potsherds, it will be collected whilst possible intact surface structures such as hut foundations, enclosures etc. will be mapped. These activities will be informed in the Phase 2 report.

The remaining sites LIA02 and Site LIA03 will be destroyed by the proposed new mining activities and must be subjected to Phase II investigations before they may be affected by the mining operations. Phase II investigations imply that these sites have to be mapped and that test excavations have to be conducted in these sites. The Phase II investigation can only be conducted after the South African Heritage Resources Authority (SAHRA) has issued a permit which would authorise the Phase II investigation. Hereafter Hernic Bokfontein Mine can apply from SAHRA for the destruction of these settlements.

Mitigating the historical house

No mitigation measures are possible as HH01 has fallen into total disrepair. This house can be demolished without acquiring the necessary permit from SAHRA.

Managing heritage resources that may remain unaffected

The stone wallled sites

The remaining stone walled site (LIA01) must be avoided at all costs in order to ensure that this site remain unaffected with Hernic Bokfontein Mine's premises. Although Site 01 is located at a considerable distance from current mining activities it is recommended precautionary measures be taken in order to avoid that the site be damaged accidentally by mine personnel and/or vehicles. This can be achieved by means of erecting signposts at Site LIA1 with a notice reading as follows: 'Please avoid heritage site. Protected by the National Heritage Resources Act (No 25 of 1999). Any damage caused to the site may lead to prosecution'.

Graveyard

GY01 should be managed according to a management plan to ensure its future unaffected existence. The following management measures are recommended:

- The graveyard must be demarcated with a fence or with walls and should be fitted with an access gate.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This may not be necessary as GY01 is located next to a local road.
- Corridors of at least 30m should be maintained between graveyards and developmental components such as roads or other infrastructure that may be developed in the future.
- The graveyard must be inspected on a regular basis not exceeding every three months. Inspections should be noted in an inspection register. The register should outline the state of the graveyard and graves during each inspection.
- Reports on damages to any of the graves or to the graveyard (fences, walls, gates) should be followed with the necessary mitigation work which must be registered in the inspection register.
- Mitigation to graves older than sixty years can only be done after SAHRA has issued the necessary permit
- The graveyard and graves should be kept tidy from any invader weeds and any other refuse.

General (disclaimer)

It is possible that this Phase I HIA study may have missed heritage resources in the Project Area as heritage sites may lie below the surface of the earth and may only be exposed once development commences.

If any heritage resources of significance is exposed during Hernic Bokfontein's operations the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notify in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

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1 INTRODUCTION

1.1 Background and context

This updated Phase I Heritage Impact Assessment (HIA) study is one of a series of specialist study reports which are compiled in support of the upgrading of baseline information and for the amendment of the Environmental Management Program (EMP) for Hernic Bofontein Chrome Mine near Madibeng in the North West Province.

Previous heritage surveys that were conducted for developers in the Madibeng District in the North-West Province indicated that the most common types and ranges of heritage resources which exist in this part of the province consists of stone walled sites which date from the Late Iron Age. However, various types and ranges of heritage resources that qualify as part of South Africa's 'national estate' as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur across the North-West Province (see Box 1, next page).

1.2 Aims with this report

This study comprises a heritage survey (Part 8) and a heritage assessment (Part 9) for the Hernic Bokfontein operations. It includes the results from an earlier Heritage Impact Assessment (HIA) study which was done in September 2009 (Pistorius 2009) and the findings of this updated heritage survey and assessment for Hernic Bokfontein's Amended EMP report.

The aims with the current heritage survey and assessments were the following:

- To establish whether any of the types and ranges of heritage resources (the 'national estate', see Box 1) as outlined in Section 3 of the National Heritage Resources Act (Act 25 of 1999) which were identified during a HIA study done in September 2009 still occur within the perimeters of the Hernic Bokfontein Mine and whether any new discovered heritage

resources may exist.

- To confirm the significance of the heritage resources as was determined during the September 2009 heritage survey and to establish whether they will be affected by Hernic's proposed new mining activities and to establish the significance of any new heritage resources which may be discovered during this survey.
- To make recommendations regarding the mitigation or the conservation of any heritage resources that have been affected since a heritage survey was conducted in September 2009 or which may be affected by any new proposed mining activities.

1.3 Assumptions and limitations

The findings, observations, conclusions and recommendations reached in this report are based on the author's best scientific and professional knowledge, available information and his ability to keep up with the physical and other comprehensive challenges that the project commanded.

The report is based on accepted archaeological survey and assessment techniques and methodologies and primarily consisted of a survey with a vehicle and pedestrian surveys. Six officials from Hernic Bokfontein who are well acquainted with the mining area accompanied the author (see Part 13, 'Spokespersons consulted').

The author preserves the right to modify aspects of the report including the recommendations if and when new information becomes available particularly if this information may have an influence on the reports final results and recommendations.

This heritage survey may have missed heritage resources in the project area as heritage sites may occur in tall grass or thick clumps of vegetation in undisturbed

parts of the mining area while others may be located below the surface of the earth and may only be exposed once development commences.

It is also possible that heritage resources may have been missed as a result of human failure to recognise or to observe them.

2 DETAILS OF THE SPECIALIST

Specialist Details: Dr Julius Pistorius

Profession: Archaeologist, Museologist (Museum Scientists), Lecturer, Heritage Guide Trainer and Heritage Consultant

Qualifications:

BA (Archaeology, Anthropology and Psychology) (UP, 1976)

BA (Hons) Archaeology (distinction) (UP, 1979)

MA Archaeology (distinction) (UP, 1985)

D Phil Archaeology (UP, 1989)

Post Graduate Diploma in Museology (Museum Sciences) (UP, 1981)

Work experience:

Museum curator and archaeologist for the Rustenburg and Phalaborwa Town Councils (1980-1984)

Head of the Department of Archaeology, National Cultural History Museum in Pretoria (1988-1989)

Lecturer and Senior lecturer Department of Anthropology and Archaeology, University of Pretoria (1990-2003)

Independent Archaeologist and Heritage Consultant (2003-)

Accreditation: Member of the Association for Southern African Professional Archaeologists. (ASAPA)

Summary: Julius Pistorius is a qualified archaeologist and heritage specialist with extensive experience as a university lecturer, museum scientist, researcher and heritage consultant. His research focussed on the Late Iron Age Tswana and Lowveld-Sotho (particularly the Bamalatji of Phalaborwa). He has published a book on early Tswana settlement in the North-West Province and has completed an unpublished manuscript on the rise of Bamalatji metal workings spheres in Phalaborwa during the last 1 200 years. He has written a guide for Eskom's field personnel on heritage management. He has published twenty scientific papers in academic journals and several popular articles on archaeology and heritage matters. He collaborated with environmental companies in compiling State of the Environmental Reports for Ekhurhuleni, Hartebeespoort and heritage management plans for the Magaliesberg and Waterberg. Since acting as an independent consultant he has done approximately 800 large to small heritage impact assessment reports. He has a longstanding working relationship with Eskom, Rio Tinto (PMC), Rio Tinto (EXP), Impala Platinum, Angloplats (Rustenburg), Lonmin, Sasol, PMC, Foskor, Kudu and Kelgran Granite, Bafokeng Royal Resources, Pilanesberg Platinum Mine etc. as well as with several environmental companies.

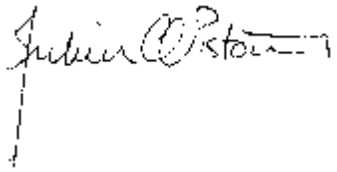
3 DECLARATION OF INDEPENDENCE

I, Julius CC Pistorius, declare that:

•I act as the independent environmental practitioner in this application
•I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
•I declare that there are no circumstances that may compromise my objectivity in performing such work;
•I have expertise in conducting environmental impact assessments, including knowledge of the National Heritage Resources Act (No 25 of 1999) and any guidelines that have relevance to the proposed activity;
•I will comply with the Act, regulations and all other applicable legislation;
•I will take into account, to the extent possible, the matters listed in regulation **8** of the regulations when preparing the application and any report relating to the application;
•I have no, and will not engage in, conflicting interests in the undertaking of the activity;
•I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
•I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
•I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
•I will keep a register of all interested and affected parties that participated in a public participation process; and
•I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
•all the particulars furnished by me in this form are true and correct;
•will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
•I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010.



Signature of the heritage practitioner:
20 April 2018

4 LEGAL FRAMEWORK

South Africa's heritage resources ('national estate') are protected by international, national, provincial and local legislation which provides regulations, policies and guidelines for the protection, management, promotion and utilization of heritage resources. South Africa's 'national estate' includes a wide range of various types of heritage resources as outlined in Section 3 of the National Heritage Resources Act (NHRA, Act No 25 of 1999) (see Box 1).

At a national level heritage resources are dealt with by the National Heritage Council Act (Act No 11 of 1999) and the National Heritage Resources Act (NHRA, Act No 25 of 1999). According to the NHRA (Act No 25 of 1999) heritage resources are categorized using a three-tier system, namely Grade I (national), Grade II (provincial) and Grade III (local) heritage resources.

At the provincial level, heritage legislation is implemented by Provincial Heritage Resources Agencies (PHRA's) which apply the National Heritage Resources Act (Act 25 of 1999) together with provincial government guidelines and strategic frameworks. Metropolitan or Municipal (local) policy regarding the protection of cultural heritage resources is also linked to national and provincial acts and is implemented by the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Agencies (PHRA's).

4.1 Legislation relevant to heritage resources

Legislation relevant to South Africa's national estate includes the following:

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

Box 1: Types and ranges of heritage resources (the national estate) as outlined in Section 3 of the National Heritage Resources Act, 1999 (No 25 of 1999).

The National Heritage Resources Act (Act No 25 of 1999, Art 3) outlines the following types and ranges of heritage resources that qualify as part of the National Estate, namely:

(a) places, buildings structures and equipment of cultural significance;

(b) places to which oral traditions are attached or which are associated with living heritage;

(c) historical settlements and townscapes;

(d) landscapes and natural features of cultural significance;

(e) geological sites of scientific or cultural importance;

(f) archaeological and palaeontological sites;

(g) graves and burial grounds including-

(i) ancestral graves;

(ii) royal graves and graves of traditional leaders;

(iii) graves of victims of conflict;(iv) graves of individuals designated by the Minister by notice in the Gazette;

(v) historical graves and cemeteries; and

(vi) other human remains which are not covered by in terms of the Human Tissues Act, 1983 (Act No 65 of 1983);

(h) sites of significance relating to the history of slavery in South Africa;

(i) movable objects, including -

(i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;

(ii) objects to which oral traditions are attached or which are associated with living heritage;

(iii) ethnographic art and objects;

(iv) military objects;

(v) objects of decorative or fine art;

(vi) objects of scientific or technological interest; and

(vii) books, records, documents, photographs, 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).

The National Heritage Resources Act (Act No 25 of 1999, Art 3) also distinguishes nine criteria for places and objects to qualify as 'part of the national estate if they have cultural significance or other special value …'. These criteria are the following:

(a) its importance in the community, or pattern of South Africa's history;

(a) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;

(b) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;

(c) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;

(e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;

(f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;

(g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; (h)

(h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;

(i) sites of significance relating to the history of slavery in South Africa

4.1.1 NEMA

The NEMA stipulates under Section 2(4)(a) that sustainable development requires the consideration of all relevant factors including (iii) the disturbance of landscapes and sites that constitute the nation's cultural heritage must be avoided, or where it cannot be altogether avoided, is minimised and remedied. Heritage assessments are implemented in terms of the NEMA Section 24 in order to give effect to the general objectives. Procedures considering heritage resource management in terms of the NEMA are summarised under Section 24(4) as amended in 2008. In addition to the NEMA, the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPA) may also be applicable. This act applies to protected areas and world heritage sites, declared as such in terms of the World Heritage Convention Act, 1999 (Act No. 49 of 1999) (WHCA).

4.1.2 MPRDA

The MPRDA stipulates under Section 5(4) no person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without (a) an approved environmental management programme or approved environmental management plan, as the case may be.

4.1.3 NHRA

According to Section 3 of the NHRA (Act No 25 of 1999) the 'national estate' comprises a wide range and various types of heritage resources (see Box 1).

4.1.3.1 Heritage Impact Assessment studies

According to Section 38 of the National Heritage Resources Act (Act No 25 of 1999) a Heritage Impact Assessment (HIA) process must be followed under the following circumstances:

- The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- The construction of a bridge or similar structure exceeding 50m in length
- Any development or activity that will change the character of a site and which exceeds 5 000m^2 or which involve three or more existing erven or subdivisions thereof
- Re-zoning of a site exceeding 10 000 m^2
- Any other category provided for in the regulations of SAHRA, a provincial or local heritage authority or any other legislation such as NEMA, MPRDA, etc.

4.1.3.2 Section 34 (Buildings and structures)

Section 34 of the NHRA provides for general protection of structures older than 60 years. According to Section 34(1) no person may alter (demolish) any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or any other facility made by people and which is fixed to land and which includes fixtures, fittings and equipment associated with such structures.

Alter means any action which affects the structure, appearance or physical properties of a place or object, whether by way of structural or any other works such as painting, plastering, decorating, etc..

Most importantly, Section 34(1) clearly states that no structure or part thereof may be altered or demolished without a permit issued by the relevant Provincial Heritage Resources Authority (PHRA). These permits will not be granted without a HIA being completed. A destruction permit will thus be required before any removal and/or demolition may take place, unless exempted by the PHRA according to Section 34(2) of the NHRA.

4.1.3.3 Section 35 (Archaeological and palaeontological resources and meteorites)

Section 35 of the NHRA provides for the general protection of archaeological and palaeontological resources, and meteorites. In the event that archaeological resources are discovered during the course of development, Section 38(3) specifically requires that the discovery must immediately be reported to the PHRA, or local authority or museum who must notify the PHRA. Furthermore, no person may without permits issued by the responsible heritage resources authority may:

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological material or object or any meteorite
- trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or paleontological material or object, or any meteorite; or bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and paleontological material or objects, or use such equipment for the recovery of meteorites
- alter or demolish any structure or part of a structure which is older than 60 years.

Heritage resources may only be disturbed or moved by an archaeologist after being issued with a permit received from the South African Heritage Resources Agency (SAHRA). In order to demolish heritage resources the developer has to acquire a destruction permit by from SAHRA.

4.1.3.4 Section 36 (Burial grounds and graves)

Section 36 of the NHRA allows for the general protection of burial grounds and graves. Should burial grounds or graves be found during the course of development, Section 36(6) stipulates that such activities must immediately cease and the discovery reported to the responsible heritage resources authority and the South African Police Service (SAPS). Section 36 also stipulates that no person without a permit issued by the relevant heritage resources authority may:

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 or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

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

Section 36 of the NHRA divides graves and burial grounds into the following categories:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries

f. human remains

Human remains less than 60 years old are subject to provisions of the National Health Act, 2003 (Act No 61 of 2003), Ordinance 12 of 1980 (Exhumation Ordinance) and Ordinance No 7 of 1925 (Graves and dead bodies Ordinance, repealed by Mpumalanga). Municipal bylaws with regard to graves and graveyards may differ. Professionals involved with the exhumation and relocation of graves and graveyards must establish whether such bylaws exist and must adhere to these laws.

Unidentified graves are handled as if they are older than 60 years until proven otherwise.

Permission for the exhumation and relocation of graves older than sixty years must also be gained from descendants of the deceased (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place.

Human remains can only be handled by a registered undertaker or an institution declared under the Human Tissues Act (Act 65 of 1983 as amended).

4.1.3.5 Section 37 (Public monuments and memorials)

Section 37 makes provision for the protection of all public monuments and memorials in the same manner as places which are entered in a heritage register referred to in Section 30 of the NHRA.

4.1.3.6 Section 38 (HRM)

Section 38 (8): The provisions of this section do not apply to a development as described in Section 38 (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation. Section 38(8) ensures cooperative governance between all responsible authorities through ensuring that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of Subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

The Listed Activities in terms of the Government Notice Regulations (GNRs) stipulated under NEMA for which Environmental Authorisation (EA) will be applied for will trigger a HIA as contemplated in Section 38(1) above as follows:

4.4.4 NEMA Appendix 6 requirements

NEMA Regulations (2014) - Appendix 6	Relevant section in report
Details of the specialist who prepared the report	Dr Julius CC Pistorius
The expertise of that person to compile a specialist report including a curriculum vitae	Part 2. Details of the specialist
A declaration that the person is independent in a form as may be specified by the competent authority	Part 3. Declaration of independence
An indication of the scope of, and the purpose for which, the report was prepared	Part 1. Introduction
The date and season of the site investigation and the relevance of the season to the outcome of the assessment	Part 6. Approach and Methodology Part 6.1. Field survey
A description of the methodology adopted in preparing	Part 6. Approach and Methodology

the report or carrying out the specialised process	
The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	Part 7. Contextualising the project area
An identification of any areas to be avoided, including buffers	Part 9.3. Mitigating the heritage resources Part 9.4. Managing the heritage resources
A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figure 4
A description of any assumptions made and any uncertainties or gaps in knowledge;	Part 1.3. Assumptions and limitations
A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Part 8. Types and ranges of heritage resources Part 9.2.The significance of any potential impacts on the heritage resources
Any mitigation measures for inclusion in the EMPr	Part 9.3. Possible impact on the heritage resources Part 9.4 Mitigating the heritage resources Part 9.5 Managing heritage resources that remain unaffected
Any conditions for inclusion in the environmental authorisation	Part 9.4 Mitigating the heritage resources Part 9.5 Managing heritage resources that remain unaffected Part 10 Conclusion and recommendation
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Part 10 Conclusion and recommendations
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised and	Part 10 Conclusion and recommendations
If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the	Part 9.3. Mitigating the heritage resources Part 9.4. Managing heritage resources that remain unaffected

closure plan	
A description of any consultation process that was undertaken during the course of carrying out the study	Part 6.4 Consultation process undertaken and comments received from stakeholders
A summary and copies if any comments that were received during any consultation process	Part 6.4 Consultation process undertaken and comments received from stakeholders
Any other information requested by the competent authority.	None

5 THE HERNIC BOKFONTEIN OPERATIONS

5.1 Location

Hernic Bokfontein Chrome Mine's proposed Project Area is located to the south-west of Madibeng in the Central Bankeveld in the North-West Provinces of South Africa.

The Project Area involves the farms Bokfontein 448, Uitvalgrond 416, Krokodildrift 446JQ and Boschfontein 448JQ which is located on a flat area between the Magaliesberg in the south and the series of norite kopjes running from Pretoria

(east) to Marikana (west) further to the north (Figures 1, 2 & 3) (Madibeng 2527DB; 1:50 000 topographical map).

5.2 The nature of the Project Area

The Hernic Bokfontein Project Area stretches across the level plains of the Central Bankeveld between the Magaliesberg in the south and the series of norite hills running from the east towards the west further towards the north. The southern boundary of the Project Area is constituted by the N4 running from Pretoria in the east to Rustenburg in the west.

The Project Area stretches across level turf veldt, parts of which have been used for agricultural activities since the first colonial farmers occupied this part of the Central Bankeveld after the 1840's. Parts of the Project Area which have not been affected by development activities are covered with *Rhus lancea* (Karee trees) and other smaller *acacia* trees.

The far eastern part of the Project Area, in general, can be described as relatively untouched except where agriculture activities were conducted. The western and central parts of the Project Area have been disturbed by open cast mining operations. Part of this landscape, however, has also been altered during the pre-mining period as a result of agricultural activities which have been practised in this part of the Central Bankeveld.

Figure 1- The Project Area covers a disturbed and partly undisturbed outstretched piece of turf veld running between the N4 in the south and a series of norite hills far to the north. This part of the Central Bankeveld was partly affected by agricultural activities from the distant past and more recently by mining activities.

Note the series of norite hills in the far background where numerous Tswana communities established spheres of influence during the Late Iron Age (above) (see Part 8, 'Contextualising the Project Area').

Figure 2- More recent mining activities have altered the natural appearance and character of the mining area. The larger part of the project area has been worked intensely as open cast mining activities attest. However, stone walled sites and a graveyard have been recorded in this part of the Project Area (above).

5.3 The nature of the Hernic Bokfontein Chrome Mine's Operations

Hernic Ferrochrome (Pty) Ltd (hereafter referred to as Hernic), is an existing chrome and ferrochrome producer near the town of Madibeng (Brits) in the North West Province, which owns two mines and a smelter operation.

The mining operations consist of two underground mine operations and one opencast mine operation. The smelter operation is adjacent to the operational Maroelabult Mine (hereafter referred to as the Morula Plant and/or Morula Mine) which is an underground mine (currently in process to be ramped-up to full production level) and approximately 15 *km* from its Bokfontein Chrome Mine (hereafter referred to as Bokone Mine) opencast and underground mines.

The Bokone mining operations developed in phases since 2006. Opencast mine workings developed in three phases. Phase 1 has been mined out and rehabilitated, rehabilitation is currently taking place at phase 2 (east side) and phase 3 (west side) is currently being mined.

Mining and Rehabilitation activities conducted during Phase 3 have largely destroyed Sites LIA04 and LIA05 whilst Phase 2 future mining will affect Sites LIA02 and LIA03.

Future opencast mine workings will extend to a depth of approximately 100 *m* below surface by a cut and fill mining method. An underground mine shaft for underground mining operations has also been developed.

This particular project relates to the application(s) for Environmental Authorisation (EA) as required to upgrade/ expand/ add certain activities to the current Bokone Mine process.

These proposed new activities include the beneficiation and concentration of ore (crushing, screening, dense medium separation, spiralling and heavy medium separation) in a new proposed Ore Beneficiation (OB) Plant. Once beneficiated, the ore will be transported to the Morula Plant for pelletising at the Pelletising and Sintering Plants and for smelting at the Furnaces; the construction and operation of a Tailings Storage Facility (TSF) and associated Return Water Dam (RWD) to accommodate the tailings arising; the construction and operation (recovery) of Platinum Group Minerals (PGM)'s from re-mined and current tailings and in general the upgrading and refining of various management measures as relating to waste and water management.

Based on the nature of the proposed activities, the necessary applications have to be supported *inter alia* by a Scoping and Environmental Impact Assessment and Reporting (S&EIR) Process as provided for in the 2014 EIA Regulations (GNR 982 of 4 December 2014) as amended. In view of the fact that Bokone operates as a mine, the administrative process is that of the "Single Environmental System" with the Department of Mineral Resources (DMR) being the Competent Authority (CA).

6 APPROACH AND METHODOLOGY

This updated HIA study was conducted by means of the following:

6.1 Field survey

Field surveys were conducted during 4 and 7 August 2017. On 4 August the author were accompanied by three officials from Hernic Bokfontein Mine**.** During the earlier heritage survey conducted in September 2009 three additional employers of the mine assisted the author during the heritage survey.

Archaeological visibility in general was good as the survey was conducted towards the end of winter when vegetation has receded across the veld. However, a dense stand of Cenchrus Cilliaris covered some of the stone walled sites whose spatial features could not be observed at first hand.

The field survey for the Hernic Bokfontein operations was conducted by means of following mine roads whilst other accessible pathways such as ‘two spoor’ field tracks were also utilized in order to gain access to the proposed mine development footprint. Only main routes were recorded with a mounted GPS instrument. Pedestrian surveys were undertaken from these primary access routes (Figure 3).

All coordinates for heritage resources recorded by the author were done with a Garmin Etrex hand set Global Positioning System (instrument) with an accuracy of < 15m.

The western and central part of the mining area is intensely disturbed as a result of open cast mining activities whilst some undisturbed land still occurs in the eastern part of the mining area. Older mining activities were also rehabilitated in this part of the mining area.

Figure 3- GPS track log which was registered with a mounted GPS instrument. Pedestrian surveys were conducted from the main pathway (above).

Ecological indicators such as alternations in vegetation patterns; open or bald spots in the veld or patches with grass or extreme dense vegetation as well as natural features such as protrusions of boulders were searched as these could harbour stone walls or dwellings of farm workers who may have lived here in the past.

Google imagery served as a supplementary source (*prior* and after fieldwork) to establish the possible presence of heritage resources such as farm homesteads or extended stone walled villages.

6.2 Databases, literature survey and maps

Databases kept and maintained at institutions such as the PHRA, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and SAHRA's national archive (SAHRIS) were consulted to determine whether any heritage resources of significance had been identified during earlier heritage surveys in or near the project area.

The author is acquainted with the project area at large as he has done several heritage impact assessment studies near the proposed project area. Several earlier heritage impact assessment studies have also been done by other fieldworkers in and close to the project area. These studies provided information

regarding the nature and heritage character of the area, namely (see Part 11 ‘Bibliography relating to earlier heritage studies’).

Literature relating to the pre-historical and historical unfolding of the larger Project Area was reviewed. This review focused on local pre-historical and historical groups such as the Tswanas who lived in the larger region. The historical or colonial period is briefly referred to as towns such as Madibeng, Rustenburg and Marikana (Schaapkraal) represent some of the oldest towns that were established by colonists (Voortrekkers) north of the Vaal River.

It is important to contextualise the pre-historical and historical background of the region in order to comprehend the identity and meaning of heritage sites in the project area and subsequently to determine the significance of any remains which may have been affected by Hernic Bokfontein’s operations or which may be affected by future mining activities (see Part 8, ‘Contextualising the Project Area’ and Part 11, ‘Select Bibliography’).

In addition, the project area was also studied by means of maps on which it appears (Madibeng 2527DB; 1:50 000 topographical map).

6.3 Spokespersons consulted

No community or community members occupy the project area. Consequently nobody was consulted regarding the meaning and significance of some of the stone walled sites or the graveyard in the project area or any other possible intangible heritage matters (see below).

The larger part of the field survey was done in conjunction with mine officials from Hernic Bokfontein who are familiar with the Hernic Bokfontein operations see Part 13, ‘Spokespersons consulted’).

6.4 Consultation process undertaken and comments received from stakeholders

No specific consultation process was undertaken for the purposes of the heritage study as stakeholder engagement for the project is being handled by JMA Consulting as part of the EMP Amendment process.

6.5 Significance rating

The significance of possible impacts on the heritage resources was determined using a ranking scale based on the following:

- Occurrence
  - Probability of occurrence (how likely is it that the impact may/will occur?), and
  - Duration of occurrence (how long may/will it last?)
- Severity
  - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and
  - Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?).

Each of these factors has been assessed for each potential impact using the following ranking scales:

Probability:	Duration:
5 – Definite/don't know	5 – Permanent
4 – Highly probable	4 – Long-term (ceases with the operational life)
3 – Medium probability	3 - Medium-term (5-15 years)
2 – Low probability	2 - Short-term (0-5 years)
1 – Improbable	

0 – None	1 – Immediate
Scale: 5 – International 4 – National 3 – Regional 2 – Local 1 – Site only 0 – None	Magnitude: 10 - Very high/don't know 8 – High 6 – Moderate 4 – Low 2 – Minor

The heritage significance of each potential impact was assessed using the following formula:

Significance Points (SP) = (Magnitude + Duration + Scale) x Probability.

The maximum value is 100 Significance Points (SP). Potential environmental impacts are rated as very high, high, moderate, low or very low significance on the following basis:

- More than 80 significance points indicates VERY HIGH heritage significance.
- Between 60 and 80 significance points indicates HIGH heritage significance.
- Between 40 and 60 significance points indicates MODERATE heritage significance.
- Between 20 and 40 significance points indicates LOW heritage significance.
- Less than 20 significance points indicates VERY LOW heritage significance.

7 CONTEXTUALISING THE PROJECT AREA

Several studies for developers have been conducted in the larger Project Area (see Part 12 ‘Bibliography relating to earlier heritage studies’). These studies have indicated that the most common heritage resources which occur in the region are the following:

- Stone walled sites which date from the Late Iron Age are relatively common in the region and can be associated with various pre-historical and historical Tswana spheres of influence.
- Second or third generation farmstead complexes which date from the first half of the twentieth century.

Heritage resources which are scarce in the larger Project Area include the following:

- Stone Age sites with dense concentrations of stone tools on the surface of the land although it is expected that such sites do exist but that they have not been discovered and/or adequately recorded.
- Historical platinum and chrome mining activities which sometimes are associated with limited infrastructure.

The following overview of pre-historical, historical and cultural evidence outlines the types and range of heritage resources which do occur across the larger Project Area.

The Bushveld Igneous complex gave rise to the Magaliesberg and the Witwatersberge more than 2 000 million years ago. The Magalies Valley (known as the Moot) lies between these mountain ranges; and the Bankeveld and its characteristic series of norite hills run parallel to the north of the Magaliesberg. The Magaliesberg is traversed by the Apies (Pebane), the Crocodile (Oori) and the Hex (Mutsukubje) rivers which all flow to the north. The Sterkstroom (Gwathle) and Waterval (Tlhabane) rivers' catchments are also in the Magaliesberg (Horn 1996).

Human history is closely linked to the mountain and its natural resources, which include an abundance of surface water, edible wild plants and fruit, animals and insects that can be used as food and as a supply of other resources. The various necks (*poorte*) in the Magaliesberg, the result of faults, run uninterrupted from Pretoria in the east, to Rustenburg in the west. Since earliest times, these necks served as gateways for animals migrating between the warm bushveld savannah in the north to the cooler grassy plains on the Highveld to the south. Later, when the first humans lived in this area, nomadic Stone Age hunters followed migrating game through these necks. Vaguely recognisable low stone walls in the necks in

the Magaliesberg also still reflect a human presence in the mountain from the earliest times, built by people waiting for game to hunt or an enemy to defend themselves, or using the necks as lookout points to look out beyond the Magaliesberg (Carruthers 2000).

Commemorative stone cairns (*isivivani*) found at Magatasnek, Hornsnek and other places in the Magaliesberg accumulated when travellers, for as many years as humans passed along those routes, added stones to these heaps in the belief that this act would ensure them safe passage when they crossed the mountain.

The cultural historical significance of the Magaliesberg can be traced back to the Early Stone Age, which began three million years ago, when *Australopithecinae*, humans' earliest ancestors, roamed the dolomite area to the south of the Magaliesberg. Here, in what is today called the Cradle of Humankind, one of South Africa's seven World Heritage Sites, some of the earliest evidence for the origins of human life was found in the Sterkfontein, Swartkrans and Kromdraai caves (Deacon & Deacon 1999).

Australopithecus was succeeded by the Acheulians, who spread remarkably quickly from Africa across the world. The Acheulians adapted successfully to various climates and environments hundreds of thousands of years ago. Large numbers of characteristic Acheulian hand axes and cleavers, stylistically similar across the world and manufactured by *Homo Erectus*, have been found at Wonderboompoort in the Magaliesberg (Mason 1968).

The predecessors to modern humans, *homo sapiens*, lived in the Magaliesberg during the Middle Stone Age, approximately two hundred thousand years ago. Middle Stone Age tools were found in the Kruger Cave and near Silkaatsnek. Middle Stone Age hunters-gatherers lived in open sites and in caves. They knew how to make and control fire and used bows and arrows to hunt. They also gathered a wide range of foods from the veldt (Wadley 1987).

More than twenty thousand years ago, Middle Stone Age people were joined by Late Stone Age hunter-gatherers that either lived near small streams in the Magalies Valley or occupied caves on the slopes of the Magaliesberg. They manufactured microlithic stone tools and ate plant foods, including marula fruit. Rock shelters and caves were used as temporary dwellings and as religious sites where the people left rock paintings on the faces of walls. The Kruger Cave, Jubilee and Xanada shelters were all occupied by these people, whose ways of life were very similar to the historically known San people (Wadley 1987; Deacon & Deacon 1999).

Rock paintings sites occur at Jubilee Shelter and in the Kruger Cave near Olifantsnek. More of these sites will probably be discovered. Many exquisite rock engravings have been found on diabase rock along the south-facing slopes of the Magaliesberg, for example, at Maanhaarrand and Avondale. Most of these engravings depict animal figures in such detail that individual species can be identified without any difficulty (Mason 1968).

Rock engravings and paintings reflect much of the way Late Stone Age people thought. However, some engravings on smaller moveable rocks have been illegally removed from the Magaliesberg in the past. Consequently, a collection of engravings was removed from the mountain to the Rock Art Museum at the Johannesburg Zoo in the 1960s. Here they can be viewed by the public and they can be conserved.

From AD300 to AD500, mixed farming and pottery manufacture were practised near Broederstroom along the lower slopes of the Witwatersberge, south of the Magaliesberg. These Early Iron Age communities kept small livestock and possibly cattle as well. These farmers were the first humans to occupy large and semi-permanent villages near the Magaliesberg. They smelted iron ores, and they lived in what was believed to have been hemispherical mud houses in

villages built using a circular ground plan. Such remains have also been found at Derdepoort, further to the east along the Magaliesberg.

During the Late Iron Age and in the historical period (AD1650 to AD1880), Tswana tribes such as the Fokeng and Tlôkwa (Rustenburg), the Kwena Môgôpa, the Kgatla of Motŝha and the Mmakau and the Kwena of Mogale (Madibeng and Hartebeespoort) lived to the north of the Magaliesberg. The Bapô, who originated from among the Nguni in Kwa Zulu/Natal, lived at Tlhôgôkgolo (Wolhuterskop), near the northern foot of the Magaliesberg, where they intermarried with local baTswana to become known as the Kwena Mogale. The Magaliesberg's name is derived from the name of one of their ancestral chiefs, Mogale (TNAD 1905).

Numerous stone walled sites, probably occupied by Sotho-Tswana and Ndebele clans during the Late Iron Age and historical period, occur along the slopes of the Magaliesberg. These settlements are visible on aerial photographs but most have not been studied or recorded in any detail as yet (Mason 1986). Stone walled settlements which date from the Late Iron Age and the Historical Period are common in the norite hills to the north of the Project Area and are associated with Kgatla and Kwena spheres of influence.

Conflicts and disputes between some baTswana clans near the Magaliesberg in the early nineteenth century were followed by the *difaqane* (AD1827-AD1832) when the Ndebele of Mzilikazi arrived in the Bankeveld. Many Tswana clans were subjugated by the Ndebele, who established at least three military kraals (*amakhanda*) near the Magaliesberg, at Silkaatsnek (derived from Mzilikazi's name), at Wonderboompoort and in the foothills of the Magaliesberg near Rustenburg. It is said that the Ndebele ruler had many of his foes and disloyal tribal members executed by having them thrown from the krantzes at Silkaatsnek. The ruins of Mzilikazi's villages (*imizi)* and military kraals

(*amakhanda*) can still be seen in the Magaliesberg (Pistorius 1997a, 1997b, 1998).

The first travellers to visit the Magaliesberg during the early decades of the 19th century were traders, missionaries, scientists and adventurers such as Robert Schoon and William McLuckie (1829), Robert Moffat (1829), Andrew Smith (1835) and Cornwallis Harris (1836). Charles Bell and Cornwallis Harris left paintings of the Magaliesberg. They also illustrated animals and plants from the region and left depictions of the local population which serve a record of the cultural history and lifestyles of Late Iron Age peoples near and in the Magaliesberg. They depicted the wretched living conditions of refugees, victims of the *difaqane*, living in massive fig trees (*Ficus Ingens*) along the Magaliesberg between Boshoek and Rustenburg during the 1830s.

The first Voortrekkers settled near the Magaliesberg during the 1840s. Voortrekker leaders such as Gert Kruger moved into the Moot and established the farm Hekpoort, now a small town in the area. Casper Kruger occupied farms on the southern slope of the Magaliesberg near Olifantsnek. Paul Kruger owned Waterkloof and later Boekenhoutfontein, and Andries Potgieter settled on Buffelshoek on the southern slopes of the Magaliesburg near Rustenburg. Johan Schoeman occupied Schoemansrust along to the Crocodile River, now in Hartbeespoort. Andries Pretorius acquired the farm 'Grootplaas', now called De Rust, which is partly flooded by the Hartebeespoort Dam (Bergh 1992; Erasmus 1995). A potential battle in a civil war between different factions among the Voortrekkers was warded off near the Magaliesberg in 1864. The opposing factions confronted each other in one of the necks in the Magaliesberg. The neck subsequently came to be called Kommandonek.

The Magaliesberg became an important battlefield during the Second Anglo Transvaal War (1899-1902). The British used the mountain as a natural barrier against which mobile Boer commandoes could be driven and trapped, and the

Boer commandoes, who knew the terrain well, used the mountainous terrain to ambush the British. The British defensive system included blockhouses and redoubts which were established along the Magaliesberg and the Witwatersberg. Battles between Boer and Brit in the Magaliesberg during 1900 included the two battles of Silkaatsnek for control of the Rustenburg/Pretoria road; a battle at Olifantsnek for control of the Krugersdorp/Rustenburg road; the battle at Nooitgedacht, where the Boers defeated a large British column, and a battle at Buffelspoort, where the Boers destroyed a British supply convoy. General Beyers's escape route between Wolhuterskop and Kommandonek, across the Magaliesberg, can also be traced on maps of the area (Carruthers 2000; Van Vollenhoven 1997).

The first Boer cannons manufactured and used in Rustenburg during the Second Anglo Transvaal War (1899-1902) came from Bokfontein, to the north of the Magaliesberg. Graveyards for British and Boer soldiers, battlefields, memorials and monuments are therefore scattered all along the Magaliesberg (De Beer 1975).

The Hartebeespoort Dam (1921-1923), the Olifantsnek Dam (1932) and Buffelspoort Dam (1933) were constructed during the Depression, mostly using poor white labour. Two cemeteries close to the Magaliesberg are filled with children's graves, which attest to the hardships and poor living conditions the dam builders and their families endured. The Department of Water Affairs' engineering quarters and a residential suburb, railway lines and bridges across the Crocodile and Skeerpoort rivers can also still be seen there today (Carruthers 2000).

Ever since Carl Mauch arrived in Rustenburg and discovered chrome along the Hex River in 1865, a good deal of prospecting was done near the Magaliesberg. Minor copper and silver finds were reported. Chrome was commercially mined on De Kroon from 1921, north of the Magaliesberg. By 1925, several mines were in

operation. After Hans Merensky had discovered platinum in the Steelpoort area in 1924, he followed the Merensky Reef around the perimeter of the Bushveld complex as far as Rustenburg.

Heritage resources in the form of buildings such as residences with outbuildings and infrastructure comprising multi-purpose sheds or former conspicuous tobacco sheds don't occur on De Kroon 444JQ any longer. No first generation pioneer dwellings as the one which was found on Krokodildrift 446JQ some year ago (Pistorius 2006) are known to exist on this farm.

8 HERITAGE SURVEY FOR THE HERNIC BOKFONTEIN OPERATIONS

The results of the two heritage surveys which were conducted during September 2009 and during August 2017 are outlined.

8.1 Types and ranges of heritage resources identified during September 2009 survey

The HIA study for the proposed Project Area in September 2009 revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999), namely (Figure 4):

- Stone walled settlements which date from the Late Iron Age.
- Graveyards.

- A Historical House.

8.2 Types and ranges of heritage resources identified during August 2017 survey

The updated heritage survey done in August 2017 revealed no new heritage resources which may have been missed during the earlier survey. However, the survey pointed out that two stone walled sites (LIA04, LIA05) were largely destroyed by mining related activities, probably sometime during the last three years, whilst the historical house (HH01) has also largely fallen in disrepair.

The heritage resources identified during the 2009 survey were geo-referenced and mapped **(**Figure 4**;** Tables 1-3**).**

The heritage resources identified in September 2009 and revisited in August 2017 is now briefly discussed and illuminated with photographs.

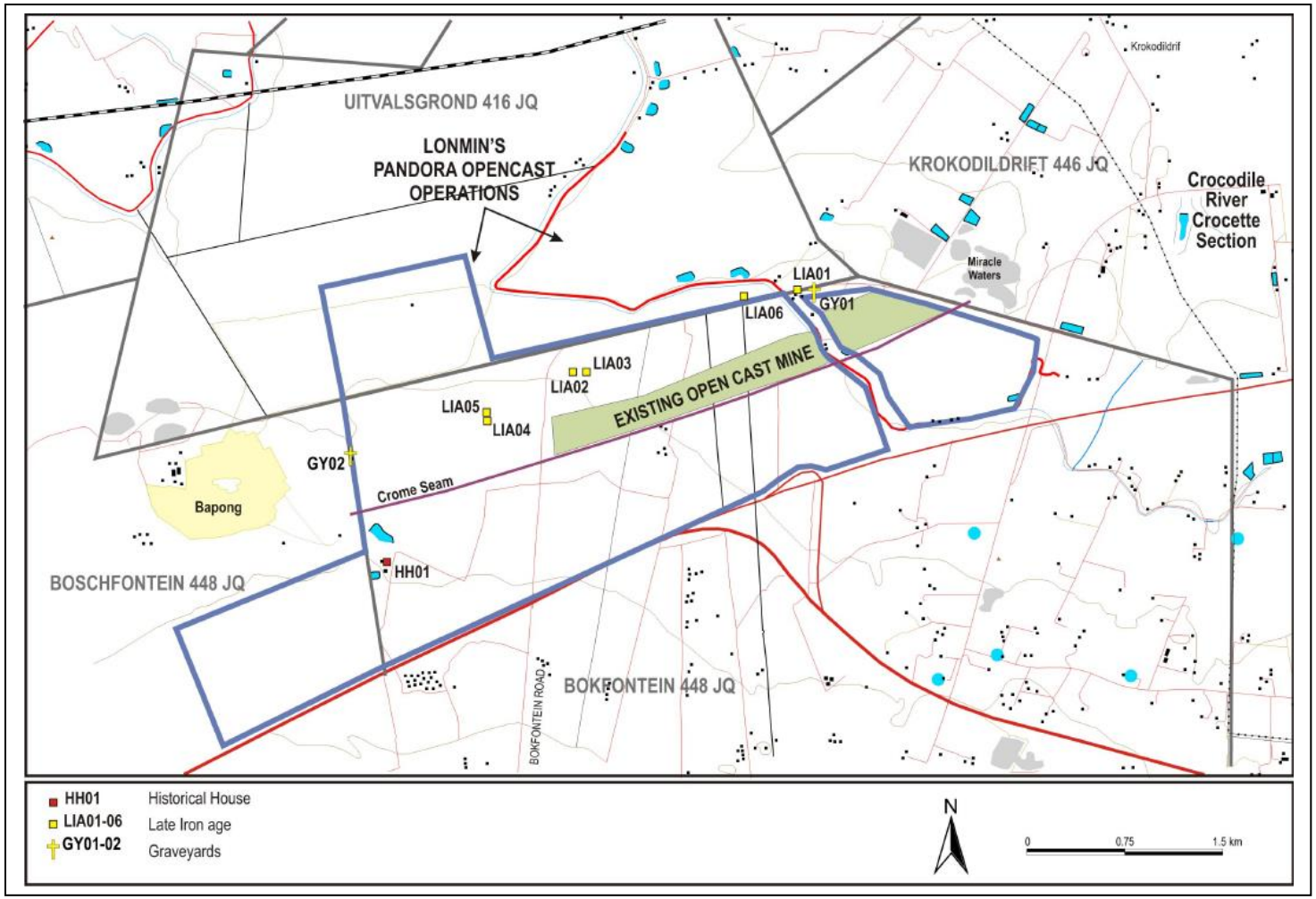


Figure 4- Heritage resources identified during the September 2009 survey in the Hernic Bokfontein mining area (above).

8.3.1 Late Iron Age stone walled sites

At least six stone walled sites dating from the Late Iron Age (AD1600 to AD1840) were identified during the September 2009 survey, namely:

8.3.1.1 Site LIA01

Site LIA01 is located in the eastern part of the Project Area.

The site represents a possible Tswana *kgoro* which comprises a ring of outer enclosures which are linked together and which together encircles centrally located cattle enclosures.

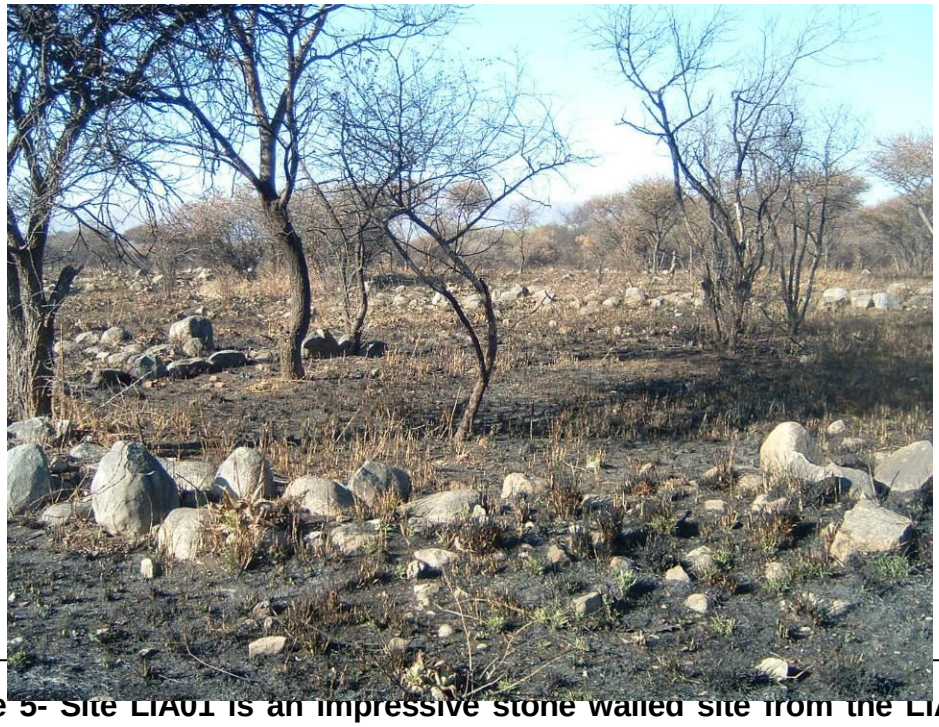


Figure 5- Site LIA01 is an impressive stone walled site from the LIA and is associated with GY01 (above).

The September 2009 survey revealed that this large stone walled site was partly damaged by road building activities whilst a brick building was erected near the perimeter of the site. However, the larger part of the site, which covers a substantial surface area, was still intact and pristine.

The survey which was conducted in August 2017 revealed that the condition of the site remained unaltered.

8.3.1.2 Site LIA02 and Site LIA03

Sites LIA02 and Site LIA03 are located next to each other in the central part of the Project Area.

Figure 6- The September 2009 survey revealed that Sites LIA02 and LIA03 comprise a large site consisting of an outer scalloped wall and centrally located enclosures, typical trademarks of Tswana villages (*dikgoro*) (above).

Figure 7- Sites LIA02 and LIA03 were covered with tall grass when the August 2017 survey was conducted and the state of preservation of the sites could not be established (above).

The September 2009 survey indicated that these two sites represent two *dikgoro* which were in a perfect state of preservation.

The survey which was conducted in August 2017 could not establish the condition of the stone walled sites as both were covered with tall grass. However, there was no reason to believe that the sites were damaged by any mining related activities.

8.3.1.3 Site LIA04 and Site LIA05

Sites LIA04 and Site LIA05 are located next to each other in the western part of the Project Area.

The September 2009 survey revealed that the two sites represent two *dikgoro* which were linked together. The perimeters of both sites were damaged by construction activities in the past.

However, the condition of both sites was described as very good.

The August 2017 survey revealed that both Site LIA04 and Site LIA05 were destroyed as a result of mining related activities.

Figure 8- The September 2009 survey revealed that Sites LIA04 and LIA05 were two linked Tswana *dikgoro* which both were in a well preserved condition although some damage was done to these sites in the past (above).

Figure 9- The August 2017 survey revealed that both Sites LIA04 and LIA05 were largely destroyed, probably sometime during the last three years as a result of mining relating activities (above).

8.1.3.4 Site LIA06

The September 2009 survey revealed that this stone walled site is located in the eastern part of the project area next to a water channel. The site was extensively damaged by different activities in the past. These activities were probably not mining related but occurred when a road was constructed through the site.

The August 2017 survey confirmed the damaged condition of the site. A remaining part of the site occurs on the opposite side of a tar road which represents Hernic Bokfontein's eastern boundary. This part of the site therefore does not fall within the mine's boundaries.

Figure 10- The remaining part of Site LIA06 (barely visible in a fired grass cover) which falls outside the eastern boundary of Hernic Bokfontein Mine's premises (above).

8.3 Graveyards

Two graveyards were observed in the Project Area, namely:

8.3.1 Graveyard 01

This graveyard is located on the eastern fringes of Site LIA01 and holds at least eleven graves. All the graves are edged and covered with stones which were collected from LIA01.

None of the graves have any headstones or plates with inscriptions on them. It is highly likely that the graveyard is older than sixty years.

The August 2017 survey revealed that the graveyard's condition is still unaffected.

8.3.2 Graveyard 02

This large graveyard is located against Hernic Bokfontein Chrome Mine's western border. The graveyard is fenced outside the mine's premises and therefore is not occurring within Hernic's current demarcated mine boundary.

GY02 is inaccessible from the mine's premises. GY02 holds a high number of graves many of which must be older than sixty years.

The August 2017 survey revealed that the condition of the graveyard has remained unaltered. As the graveyard currently falls outside the mine's boundaries it does not fall under the mine's jurisdiction and is not further discussed.

Figure 11- GY01 comprises of eleven graves on Hernic Bokfontein's eastern perimeter. All graves are covered with stones which were robbed from stone walled Site LIA01 which is situated adjacent to the graveyard (above).

Figure 12- GY02 is located on the western perimeter of Hernic Bokfontein's border and outside the mine's jurisdiction (above).

8.4 Historical house

The September 2009 survey revealed a single historical house which is located near the western border of Bokfontein Chrome Mine.

HH01was constructed with clay bricks and plastered with cement and covered with a pitched corrugated iron roof. It was fitted with steel window frames.

HH01 probably dates from the 1930's to the 1940's and was still in a pristine condition when the survey was conducted.

The August 2017 survey revealed that HH01 has fallen into total disrepair.

Figure 13- A historical house (HH01) near the western border of the Bokfontein Chrome Mine (below).

Figure 14- The August 2017 survey revealed that HH01 has fallen in total disrepair (below).

Late Iron Age Stone walled sites	Coordinates	Significance
LIA01	25º 40'.688; 27º 44'.648	**HIGH**
LIA02	25º 41'.029; 27º 43'.725	**HIGH**
LIA03	25º 41'.025; 27º 43'.782	**HIGH**
LIA04	25º 41'.226; 27º 43'.370	**HIGH**
LIA05	25º 41'.197; 27º 43'.369	**HIGH**
Inside and outside mining area		
LIA06	25º 40'.715; 27º 44'.429	**Low**

Table 1- Coordinates and significance rating for Late Iron Age sites in the Project Area (above).

Graveyards	Coordinates	Significance
Inside the mining area		
GY01	25º 40'.689; 27º 44'.715	**HIGH**
Outside the mining area		
GY02	25º 41'.378; 27º 42'.806	**HIGH**

Table 2- Coordinates and significance ratings for graveyards in the Project Area (above).

Historical house	Coordinates	Significance
HH01	25º 41'.809; 27º 42'.961	**HIGH**

Table 3- Coordinates and significance rating for a historical house in the Project Area (above).

9 HERITAGE IMPACT ASSESSMENT FOR THE HERNIC BOKFONTEIN OPERATIONS

9.1 The significance of the heritage resources

The September 2009 heritage survey followed by the August 2017 survey for the Hernic Bokfontein's operations revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999), namely:

- Stone walled settlements dating from the Late Iron Age.
- A Historical House.
- Graveyards.

The August 2017 survey also revealed that two Iron Age sites (LIA04, LIA05) were largely destroyed during the more recent past whilst a historical house (HH01) has fallen into disrepair. These heritage resources therefore have been affected as a result of direct, indirect and cumulative impacts.

The significance of the heritage resources therefore must be determined as well as the severity of the impact on the stone walled sites and the historical house in order to propose mitigation measures for the heritage resources which have been affected by mining operations and to recommend management measures for those heritage resources which will remain unaffected in the project area.

9.1.1 The significance of the stone walled sites

These remains comprise archaeological remains which are older than sixty years and therefore are protected by the National Heritage Resources Act (No 25 of 1999).

The archaeological remains are rated as of high significance. This rating is based on the use of two rating (grading) schemes, namely:

- A scheme of criteria which outlines places and objects as part of the national estate as they have cultural-historical significance or other special value (outlined in Section 3 of the NHRA [Act No 25 of 1999] (see Box 1) (Table 4).
- A field rating scheme according to which heritage resources are graded in three tiers (levels) of significance based on the regional occurrence of heritage resources (Tables 4 & 5) (Section 7 of the NHRA [Act No 25 of 1999).

9.1.1.1 Criteria to be part of the national estate

The NHRA (No 25 of 1999) distinguishes nine criteria for places and objects to be 'part of the national estate' if they have cultural significance or other special value, namely (also see Box 1):

- **Its importance in/to 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.

Low	**Medium**	**High**
Historical significance		**X**
Social significance		X
Spiritual significance		X
Scientific significance (research, use, application, e.g. in tourism industry)		X

Table 4- Rating the Iron Age remains' significance according to criteria outlined in the NHRA (25 of 1990) (above).

The highlighted criteria reflect aspects of the social, historical, spiritual and scientific significance (research, use and application, e.g. in tourism industry) of the Iron Age remains. According to these criteria the cultural historical significance of the Iron Age remains is graded as of high significance.

9.1.1.2 Field rating scheme for heritage resources

Grading of heritage resources remains the responsibility of heritage resources authorities. However, in terms of minimum standards SAHRA requires that heritage reports include field ratings in order to comply with Section 38 of the NHRA (No 25 of 1999). The NHRA (No 25 of 1999, Section 7) provides for a three-tier grading system for heritage resources. The field rating process is designed to provide a qualitative and quantitative rating of heritage resources. The rating system distinguishes three categories of heritage resources:

- Grade I Heritage resources hold qualities so exceptional that they are of special national significance.

- Grade II Heritage resources hold qualities which make them significant within the context of a province or a region.
- Grade III heritage resources are worthy of conservation, i.e. are generally protected in terms of Sections 33 to 37 of the NHRA (No 25 of 1999).

Field rating	**Grade**	**Significance**	**Recommended mitigation**
National significance	Grade 1	High significance	Nominate national site. Conservation
Provincial significance	Grade 2	High significance	Nominate provincial site. Conservation
Local significance	Grade 3A	High significance	Conservation. Mitigation not advised.
Local significance	**Grade 3B**	**High significance**	**Mitigation (part of site should be retained)**
Generally Protected (GP.A)	-	Medium to High significance	Mitigation before destruction
Generally Protected (GP.B)	-	Medium significance	Recording before destruction
Generally Protected (GP.C)	-	Low significance	Destruction

Table 5- Field rating (grading) for archaeological remains in the project area

According to the highlighted field rating scheme the Iron Age remains can be rated as of high significance (Table 5).

9.1.2 The significance of the historical house

The Historical House (HH01) is sixty years old, or is approaching this age. This structure therefore is protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999).

The significance of HH01 can further be scrutinised according to cultural and historical criteria such as the following: the cultural-historical background of this structure; its scientific or architectural value; its use in the field of tourism, museums or education as well as its aesthetic appearance; repeatability (scarcity), or its emotional (ideological) value. According to these criteria the significance of HH01 can be rated as medium to high (Table 6).

Criteria	**Low**	**Medium to High**
Cultural historical background		X
Scientific (including architectural)		X
Application value		X
Aesthetics		X
Repeatability (scarcity)		X
Ideological		X

Table 6- Cultural historical criteria for the rating (grading) of the significance of the historical house (above).

The field rating of the significance of HH01 is also indicated as medium to high (Table 6).

Field rating	**Grade**	**Significance**	**Recommended mitigation**
National significance	Grade 1	High significance	Nominate national site. Conservation
Provincial significance	Grade 2	High significance	Nominate provincial site. Conservation

Local significance	Grade 3A	High significance	Conservation. Mitigation not advised.
Local significance	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected (GP.A)	**-**	**Medium to High significance**	**Mitigation before destruction**
Generally Protected (GP.B)	-	Medium significance	Recording before destruction
Generally Protected (GP.C)	-	Low significance	Destruction

Table 6- Field rating (grading) of the significance of the historical house in the project area

9.1.3 The significance of the graveyards

Only GY01 has a bearing on this heritage report as GY02 occurs outside Hernic Bokfontein's mine premises and falls outside the mine's jurisdiction.

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (NHRA) (Act No 25 of 1999) in instances where graves are older than sixty years such as GY01.

Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the National Health Act, 2003 (Act No 61 of 2003), Municipal bylaws with regard to graves and graveyards may differ. Professionals involved with the exhumation and relocation of graves and graveyards must establish whether such bylaws exist and must adhere to these laws.

9.2 Possible future impact on the heritage resources

Hernic Bokfontein's propose expansion of mining activities will destroy Site LIA02 and Site LIA03.

9.3. Significance of the impact on the heritage resources

LIA04 and LIA05 and HH01 have been affected by direct and indirect impacts.

9.3.1 The significance of the impact on the stone walled sites

The significance of impact on Site LIA01 is low as this site is located at a considerable distance from future mining activities.

The significance of the impact on Site LIA04 and Site LIA05 was high as these sites were largely destroyed by mining activities.

The significance of impact of future mining on Site LIA02 and LIA03 will be high as these sites will be destroyed.

9.3.2 The significance of the impact on the historical house

The significance of the impact on HH01 is high as this house has fallen into total disrepair.

9.3.3 The significance of the impact on the graveyards.

GY01 is located at a considerable distance from current mining activities and will not be affected by future mining activities.

GY02 is located outside the Bokfontein Hernic Mine premises

9.4 Mitigating the heritage resources

9.4.1 Mitigating the stone walled sites

Site LIA01 will not be affected by the proposed new mining activities and therefore no mitigation measures are required.

Site LIA04 and Site LIA05 have largely been destroyed by mining activities. No mitigation measures are required. However, if any worth-while surface material still exists, e.g. diagnostic potsherds, it will be collected whilst possible intact surface structures such as hut foundations, enclosures etc. will be mapped. These activities will be informed in the Phase 2 report.

The remaining sites LIA02 and Site LIA03 will be destroyed by the proposed new mining activities and must be subjected to Phase II investigations before they may be affected by the mining operations. Phase II investigations imply that these sites have to be mapped and that test excavations have to be conducted in these sites. The Phase II investigation can only be conducted after the South African Heritage Resources Authority (SAHRA) has issued a permit which would authorise the Phase II investigation. Hereafter Hernic Bokfontein Mine can apply from SAHRA for the destruction of these settlements.

9.4.2 Mitigating the historical house

No mitigation measures are possible as HH01 has fallen into total disrepair. This house can be demolished without acquiring the necessary permit from SAHRA.

9.5 Managing heritage resources that may remain unaffected

9.5.1 The stone wallled sites

The remaining stone walled site (LIA01) must be avoided at all costs in order to ensure that this site remain unaffected with Hernic Bokfontein Mine's premises. Although Site 01 is located at a considerable distance from current mining activities it is recommended precautionary measures be taken in order to avoid that the site be damaged accidentally by mine personnel and/or vehicles. This can be achieved by means of erecting signposts at Site LIA1 with a notice reading as follows: 'Please avoid heritage site. Protected by the National Heritage Resources Act (No 25 of 1999). Any damage caused to the site may lead to prosecution'.

9.5.2 Graveyard

GY01 should be managed according to a management plan to ensure its future unaffected existence. The following management measures are recommended:

- The graveyard must be demarcated with a fence or with walls and should be fitted with an access gate.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This may not be necessary as GY01 is located next to a local road.
- Corridors of at least 30m should be maintained between graveyards and developmental components such as roads or other infrastructure that may be developed in the future.
- The graveyard must be inspected on a regular basis not exceeding every three months. Inspections should be noted in an inspection register. The register should outline the state of the graveyard and graves during each inspection.
- Reports on damages to any of the graves or to the graveyard (fences, walls, gates) should be followed with the necessary mitigation work which must be registered in the inspection register.
- Mitigation to graves older than sixty years can only be done after SAHRA has issued the necessary permit

- The graveyard and graves should be kept tidy from any invader weeds and any other refuse.

10 CONCLUSION AND RECOMMENDATION

The HIA study done in September 2009 for the Hernic Bokfontein Mine revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999), namely:

- Stone walled settlements dating from the Late Iron Age (LIA).
- Graveyards.
- A Historical House.

The updated heritage survey done in August 2017 revealed no new heritage resources which may have been missed during the earlier survey. However, the survey pointed out that two stone walled sites (LIA04, LIA05) were largely destroyed by mining related activities, probably sometime during the last three years, whilst the historical house (HH01) has largely fallen in disrepair.

The heritage resources identified during the 2009 and 2017 surveys were geo-referenced and mapped **(**Figure 4**;** Tables 1-3)**.**

The significance of the heritage resources

The significance of the stone walled sites

These remains comprise archaeological remains which are older than sixty years and therefore are protected by the National Heritage Resources Act (No 25 of 1999).

The archaeological remains are rated as of high significance. This rating is based on the use of two rating (grading) schemes, namely:

- A scheme of criteria which outlines places and objects as part of the national estate as they have cultural-historical significance or other special value (outlined in Section 3 of the NHRA [Act No 25 of 1999] (see Box 1) (Table 4).

- A field rating scheme according to which heritage resources are graded in three tiers (levels) of significance based on the regional occurrence of heritage resources (Tables 4 & 5) (Section 7 of the NHRA [Act No 25 of 1999) (Table 5).

The significance of the historical house

The Historical House (HH01) is sixty years old, or is approaching this age. This structure therefore is protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999).

The significance of HH01 can further be scrutinised according to cultural and historical criteria such as the following: the cultural-historical background of this structure; its scientific or architectural value; its use in the field of tourism, museums or education as well as its aesthetic appearance; repeatability (scarcity), or its emotional (ideological) value.

According to these criteria the significance of HH01 can be rated as medium to high (Table 6).

The significance of the graveyards

Only GY01 has a bearing on this heritage report as GY02 occurs outside Hernic Bokfontein's mine premises and falls outside the mine's jurisdiction.

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (NHRA) (Act No 25 of 1999) in instances where graves are older than sixty years such as GY01.

Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the National Health Act, 2003 (Act No 61 of 2003), Municipal bylaws

with regard to graves and graveyards may differ. Professionals involved with the exhumation and relocation of graves and graveyards must establish whether such bylaws exist and must adhere to these laws.

Possible future impact on the heritage resources

Hernic Bokfontein's propose expansion of mining activities will destroy Site LIA02 and Site LIA03

Significance of the impact on the heritage resources

The significance of the impact on the stone walled sites

The significance of impact on Site LIA01 is low as this site is located at a considerable distance from future mining activities.

The significance of impact on Site LIA04 and Site LIA05 was high as these sites were largely destroyed by mining activities.

The significance of impact on future mining on Site LIA02 and Site LIA03 will be high.

The significance of the impact on the historical house

The significance of the impact on HH01 is high as the house has fallen into total disrepair.

Mitigating the heritage resources

Mitigating the stone walled sites

Site LIA01 will not be affected by the proposed new mining activities and therefore no mitigation measures are required.

Site LIA04 and Site LIA05 have largely been destroyed by mining activities. No mitigation measures are required. However, if any worth-while surface material still exists, e.g. diagnostic potsherds, it will be collected whilst possible intact surface

structures such as hut foundations, enclosures etc. will be mapped. These activities will be informed in the Phase 2 report.

The remaining sites LIA02 and Site LIA03 will be destroyed by the proposed new mining activities and must be subjected to Phase II investigations before they may be affected by the mining operations. Phase II investigations imply that these sites have to be mapped and that test excavations have to be conducted in these sites. The Phase II investigation can only be conducted after the South African Heritage Resources Authority (SAHRA) has issued a permit which would authorise the Phase II investigation. Hereafter Hernic Bokfontein Mine can apply from SAHRA for the destruction of these settlements.

Mitigating the historical house

No mitigation measures are possible as HH01 has fallen into total disrepair. This house can be demolished without acquiring the necessary permit from SAHRA.

Managing heritage resources that may remain unaffected

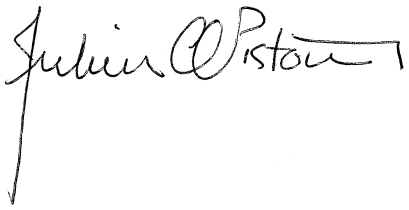
The stone wallled sites

The remaining stone walled site (LIA01) must be avoided at all costs in order to ensure that this site remain unaffected with Hernic Bokfontein Mine's premises. Although Site 01 is located at a considerable distance from current mining activities it is recommended precautionary measures be taken in order to avoid that the site be damaged accidentally by mine personnel and/or vehicles. This can be achieved by means of erecting signposts at Site LIA1 with a notice reading as follows: 'Please avoid heritage site. Protected by the National Heritage Resources Act (No 25 of 1999). Any damage caused to the site may lead to prosecution'.

Graveyard

GY01 should be managed according to a management plan to ensure its future unaffected existence. The following management measures are recommended:

- The graveyard must be demarcated with a fence or with walls and should be fitted with an access gate.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This may not be necessary as GY01 is located next to a local road.
- Corridors of at least 30m should be maintained between graveyards and developmental components such as roads or other infrastructure that may be developed in the future.
- The graveyard must be inspected on a regular basis not exceeding every three months. Inspections should be noted in an inspection register. The register should outline the state of the graveyard and graves during each inspection.
- Reports on damages to any of the graves or to the graveyard (fences, walls, gates) should be followed with the necessary mitigation work which must be registered in the inspection register.
- Mitigation to graves older than sixty years can only be done after SAHRA has issued the necessary permit
- The graveyard and graves should be kept tidy from any invader weeds and any other refuse.



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13 SPOKESPERSONS CONSULTED

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