Prepared for:

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A PHASE I DETAILED HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR THE PROPOSED MELETSE IRON ORE PROJECT ON THE REMAINDER OF THE FARMS RANDSTEPHNE 455KQ AND DONKERPOORT 448KQ NEAR THABAZIMBI IN THE LIMPOPO PROVINCE

Prepared by:

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EXECUTIVE SUMMARY

This document contains the report on a Phase I detailed Heritage Impact Assessment (HIA) study which was done according to Section 38 of the National Heritage Resources Act (No 25 of 1999) for the Meletse Iron Ore Project to the east of Thabazimbi in the Limpopo Province**.** The Meletse Iron Ore Project may have an influenece on any of the types and ranges of heritage resources as outlined in Section 3 of the National Heriatge Resources Act (No 25 of 1999)

The aims of the Phase I detailed HIA study were the following:

- To determine if any of the types and ranges of heritage resources (the 'national estate') as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur in the project area and, if so, to establish the significance of these heritage resources.
- To establish the level of significance of any possible impact on these heritage resources.
- To propose appropriate mitigation measures for those types and ranges of heritage resources that may be affected by the proposed Meletse Iron Ore project.
- To (apart from the above) describe, explain and contextualize the significance of the landscape qualities and intangible heritage of the area.

The Phase I detailed HIA study for the proposed Meletse Iron Ore project revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in and near the Project Area, namely:

- Prehistorical and historical remains consisting of mining sites and stone walled settlements, some with evidence for metal working.
- Gatkop cave in a dolomitic underground cave system which is an archaeological site with living heritage significance and which is currently used by traditional healers.
- An early twentieth century Cape Dutch styled residence.
- An informal graveyard and a second possible graveyard.

All the heritage resources were geo-referenced and mapped (Figure 13; Tables 1-6).

The significance of the heritage resources

The Meletse Iron Ore project will impact on some of the heritage resources. The significance of the heritage resources therefore has to be determined as well as the significance of any impact

on the heritage resources. Mitigation measures are proposed for those heritage resources which may be affected by the Meletse Iron Ore project whilst management measures are outlined to ensure that those heritage resources which will not be impacted by the Meletse Iron Ore project will remain unaffected in the project area.

The significance of the heritage resources and the significance of the impact on the heritage resources was determined according to the types and ranges (categories) of heritage resources which were identified in order to ensure that all heritage resources in each category receive identical mitigation measures as well as the required management measures should they be affected by the Meletse Iron Ore project or whether they remain unaffected in the project area.

The significance of possible impacts on the heritage resources was determined using a ranking scale based on various criteria.

The significance of the prehistorical and historical remains

This category of heritage resources include evidence of mining activities, stone walled settlements and settlements without stone walls (Tables 1 to 6). These prehistorical and historical remains comprise archaeological settlements which are older than sixty years which are protected by the National Heritage Resources Act (No 25 of 1999).

The significance of the mines, stone walled settlements and settlements without stone walls can be rated as medium to high when considering criteria such as the following (Tables 1-3):

- These remains can contribute to a better understanding of the lifeways of Iron Age communities in the Rooiberg-Thabazimbi area which up to the present has been understudied.
- These settlements may contribute to a better understanding of mining and metal working during the Iron Age in this metal-rich region.

The significance of Gatkop (Madimatla) cave

Gatkop cave, also known as Madimatla, is situated outside the mining area. It is part of an underground dolomitic cave system that has significance on various levels such as archaeological, ritual and religion (living heritage) and scientific. However, Gatkop cave's paleontological significance is low (Table 3).

This geological phenomenon has archaeological significance due to the presence of an extensive archaeological deposit at the cave's entrance as well as the possible presence of

archaeological pockets of material, artefacts and other possible remains (e.g. coprolites) inside the extensive network of caves, tunnels and caverns in the system.

These archaeological deposits, artefacts and other remains may provide important evidence with regard to the chronology of human-use of the cave system; the function, meaning and ideological significance of the cave system and its role within the southern Waterberg heritage landscape and even perhaps beyond its boundaries.

The archaeological significance of Gatkop cave therefore can be rated as high (Table 3).

Gatkop cave serves as a settlement with living heritage value and with tangible, intangible and immoveable attributes. The cave is also part of a sensitive cultural landscape. Gatkop cave has a long pre-historical and historical chronology of use and has maintained its importance in the ritual and religious world of some communities. The cave is central to the cosmological world of the Kgatla and neighbouring communities and is also used by African traditional churches.

Gatkop cave as an immoveable, intangible living heritage site therefore has high significance (Table 3).

The paleontological report compiled for the proposed Meletse Iron Ore Project concluded that the Meletse Iron Ore project area is of low palaeontological sensitivity. This includes the footprint area for the proposed mining activities as well as the Gatkop cave and surroundings. No occurrences of bone-bearing breccia were identified at Gatkop cave which is situated approximately four kilometres SSW of the mining area and over 600m lower in elevation. Any unrecorded palaeontological heritage resources here are therefore unlikely to be directly or indirectly affected by prospecting or any subsequent mining activity. No special measures therefore are required to protect any fossil heritage at Gatkop cave (Almond 2012, 2014).

Gatkop cave and the second cave in the dolomitic substructures on Randstephne 455KQ (located on top of a flat hill (Gatkop hill) approximately 600m from Gatkop cave) are also important to the natural scientific community who conduct multi-disciplinary research projects such as bat, zoological and paleo-climatic studies in and around the caves.
Gatkop cave, as a geological and scientific phenomenon therefore, has high significance (Table 3).

Gatkop cave can be rated as of high significance considering the following criteria derived from Section 3 of the National Heritage Resources Act (No 25 of 1999), namely (see Box 1):

(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;

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 …'. Those criteria that are applicable to Gatkop cave are the following:

(a) its importance in the community, or pattern of South Africa's history;
(b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
(c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
(d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
(f) Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
(g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
(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;

The significance of the graveyard

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 5). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (Act No 25 of 1999) whenever graves are older than sixty years. The appearance of the graves (stone piles with limited indecipherable cement headstones) suggest GY01 may be older than sixty years. 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 Human Tissues Act (No 65 of 1983 as amended).

The graveyard therefore has high significance (Table 5).

The significance of the historical house

The historical house is older than sixty years and therefore qualifies as historical remains. All remains older than sixty years are protected by the National Heritage Resources Act (No 25 of 1999).

The significance of the historical house can be described as medium to high when considering criteria such as the following (Table 6):

- Residences constructed in a Cape-Dutch architectural style in the Rooiberg-Thabazimbi area and therefore in the northern part of the country are a rarity.
- Very few historical residences still exist in the Rooiberg-Thabazimbi bushveld.
- The historical residence can be renovated and used by the mine for offices.

The historical residence therefore has medium to high significance (Table 6).

Possible impact on the heritage resources

According to the mine layout plan and the spatial distribution of the heritage resources in the project area it seems as if the following heritage resources may be directly (physically) and indirectly (non-physical) affected by the Meletse Iron Ore project.

Impacts on the prehistorical and historical remains

The following prehistorical and historical remains will be directly affected by the Meletse Iron Ore project, namely:

- All the mines (MS01, MS02 and MS03) will be affected by the proposed open cast pit and by the proposed haul road (MS04).
- Some of the Late Iron stone walled sites will be affected by the proposed waste rock dump (LIA01) and by the proposed haul road (LIA04, LIA05).

The level of significance of the impacts on the prehistorical and historical remains will be very high (Table 7).

Impacts on Gatkop cave

The spiritual and cultural significance of Gatkop cave are confined to this underground cave system and are not associated with Meletse Mountain. The mountain, or any of its features such as its peak, therefore holds no cultural, spiritual or any religious significance on its own. It is rather the undertaking of any activities with a high impact (such as mining) in the area

surrounding the cave which could pose a potential threat to the religious and cultural values which are experienced at the cave (Van Vuuren 2014b).

It therefore appears that references to 'Madimatla' as expressed by traditional healers are confined to the Gatkop cave and its associated underground cave system. This dolomitic substructure is documented and this clearly defines its extent which is to the south-west of the proposed Meletse Iron Ore project. This location is outside the mine's proposed footprint where it need not be directly (physically) impacted by the current mine development plan.

The significance of some mining impacts on Gatkop cave's tangible heritage therefore is low (Table 8).

Current direct impacts are experienced at Gatkop cave. This ritual and religious site are frequented by unregulated visitor groups who move across a sensitive archaeological deposit which is situated at the cave's entrance. The nature of certain activities and ceremonies conducted at the site, e.g. the erection of the traditional healer's preperation enclosure occurred in this deposit. A notice board and ablution facilities respectively were placed on top of the archaeological deposit and in close proximity of the cave's entrance. Ceremonies and rituals are conducted deep into the cave system where pockets of undisturbed archaeological material or other evidence (corprolites) of past human behaviour may occur. Studies conducted by natural scientists at Gatkop cave and its associated underground system may have related direct harmfull affects on the cave.

The significance of current direct impacts on Gatkop cave's tangible heritage therefore is medium to high (Table 8).

Gatkop cave is part of a sensitive cultural landscape considering it's local setting and regional context within the southern Waterberg. Influences from mining activities such as the transformation of the landscape; blasting and concomittant higher noise levels; dust pollution; population and traffic increase, etc. will undoubfully have an influence on the intangible heritage attributes of the site such as its religious and cultural historical value.

The significance of some (indirect) mining impacts on Gatkop cave's intangible heritage therefore is high (Table 8).

Impacts on the graveyard

The proposed mine foot print will not impact on the graveyard which is located to the south of the mine footprint and proposed haul roads.

The significance of any possible impact on the graveyard therfore is low. This also applies when a graveyard management program is implemented (Table 9).

Impacts on the historical house

The proposed mine foot print will not impact on the historical house which is located to the north-east of mine infrastructure.

The significance of any possible impact on the historical house therefore is low. This also applies when the house is renovated and re-used. (Table 10).

Mitigating and managing the heritage resources

The following mitigation and management measures are outlined for those heritage resources which will be affected by the Meletse Iron Ore project, namely:

Mitigating the impacts on the prehistorical and historical remains

The mines and stone walled settlements must be investigated by means of a Phase 2 investigation. An archaeologist registered with the Association for Southern African Professional Archaeologists (ASAPA) must obtain a permit from the SAHRA in order to conduct the necessary investigations. After the Phase 2 investigation has been completed the SAHRA may issue a permit for the demolishing of the mines and Late Iron Age stone walled sites.

The significance of the impact on the prehistorical and historical remains will be medium after mitigation (Table 7).

Mitigating the impacts on Gatkop cave

From the significance of possible direct and indirect impacts on Gatkop cave it is clear that mitigation and management measures have to be laid down for the cave and its immediate surroundings. Gatkop cave must be declared a provincial heritage site as was recommended in the anthropologist's reports (Van Vuuren 2014a, b). This will benefit all stakeholders. Documents, papers and acts are listed by the anthropologist to support the significance of Gatkop cave as a sensitive cultural resource falling into the immovable and intangible heritage domain. The process to follow in order to declare Gatkop cave a provincial heritage site is also outlined by the anthropologist.

The Meletse Iron Ore project area is of low palaeontological sensitivity. Potential mitigation measures which may be considered for any paleontological resources are dependent on the discovery of potentially substantial new fossil remains during the mine development program. Therefore, no further specialist palaeontological studies or mitigation measures for the Meletse Iron Ore Project are considered necessary.

- The ECO responsible for the mining and road developments should be aware of the possibility of important fossils being present or unearthed on site and should monitor all substantial excavations into fresh (*i.e.* unweathered) sedimentary bedrock for fossil remains;
- In the case of any significant fossil finds (*e.g.* vertebrate teeth, bones, stromatolites) during construction, these should be safeguarded - preferably *in situ* - and reported by the ECO as soon as possible to the relevant heritage management authority (South African Heritage Resources Agency. Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that any appropriate mitigation by a palaeontological specialist can be considered and implemented, at the developer's expense;

The palaeontologist concerned with mitigation work will need a valid collection permit from SAHRA. All work would have to conform to international best practice for palaeontological fieldwork and the study (*e.g.* data recording fossil collection and curation, final report) should adhere to the minimum standards for Phase 2 palaeontological studies recently published by SAHRA (2013) (Almond 2012, 2014).

It is not the aim of this detailed Phase I HIA study to outline a management plan for Gatkop cave as this would require interaction between various stakeholders which amongst others would involve the SAHRA, traditional healers, scientists who have an interest in the cave and Aquila. However, a few guidelines previously outlined are elaborated upon whilst some recommendations towards the archaeological conservation of the site are emphasised, namely:

- The demarcation of Gatkop cave and its surroundings is important. It is said that traditional healers are well acquainted with original access footpaths to the cave as well as the natural air ventilations (chimneys) and other concealed entrances to the cave. This will coincide with the mapped underground dolomitic substructure in which the cave is situated and could possibly serve as a guideline to establish the perimeter of the proposed provincial heritage site.

- Access control and security to Gatkop cave is a major concern considering the involvement of different interest groups, traditional healers, scientists, archaeologists, interested groups such as tourists (especially after declaration of the site), etc. and possible vandalism as soon as Gatkop cave is declared a provincial heritage site. Other problems currently experienced with uncontrolled access are littering of the site; the arrival of busloads of visitors for ritual or religious matters at the site without accommodation, etc.
- The random construction of traditional structures on site as recommended by traditional healers should consider the archaeological and heritage sensitivity of the site as current facilities on site such as the ablution, notice board, preparation enclosure for the traditional healers and perimeter fence have not considered these sensitivities when constructed.
- Traditional infrastructure on site may take the form of a small open air museum display which illuminates the role and significance of Gatkop cave and the traditional healer. However, this should occur at a locality where it will not influence the archaeological remains. A display of this nature must be of a high standard and must be maintained in order to reflect positively on the integrity of the provincial heritage site.
- The scientific importance of Gatkop cave and its extensive underground cave system suggest cooperation between archaeologists and other scientist which are not only limited to the conservation and sustainable use and study of this natural and cultural phenomenon. The exchange of knowledge will also enrich each other's field of specialisation.
- The different ways in which the cave system are studied by scientists and traditional healers warrant an investigation into each other's fields of specialisation considering the methodologies and practises which are applied and which may not contribute to the protection and conservation of this multi-varied and complicated settlement.
- Potential health hazards posed by the caves must be given high consideration during the compilation of a heritage management plan.

Different stakeholders therefore have an interest in Gatkop cave. These interests do not necessarily concur or support each of the others' motives and agendas with the site. Although the site occurs outside the boundaries of the mining area where it needs not to be directly affected by mining activities, Aquila is the proprietor of the land on which the site is located. As a potential future role player in the region the mine has to partake with other role players in the development of a management program for the site. Aquila's social responsibilities may serve

as a catalyst to provide resources towards the conservation and management of the site according to professional standards and best practises applicable to all involved with the sustainable use of the site.

The significance of any direct mining impacts on Gatkop cave is low and after a management program has been put in place for indirect impacts the significance of indirect impacts on the cave will be medium to low (Table 8).

Mitigating the impact on the graveyard

The graveyard can be mitigated by means of exhumation and relocation. The exhumation of human remains and the relocation of graveyards are regulated by various laws, regulations and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 days statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains have to be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local police.

However, the graveyard needs not to be affected by the Meletse Iron Ore project. Consequently, the following management measures are proposed for the continued unaffected existence of the graveyard during the construction, operation and eventual closure of the Meletse Iron Ore project, namely:

- The graveyards must be demarcated with a fence or with a wall and should be fitted with an access gate.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This will not be necessary if the graveyard can directly be linked with a road leading from the nearby Alma road.
- Corridors of at least 20m should be maintained between the graveyard's fence and any developmental components such as roads or other mine infrastructure that may be developed in the future.
- The graveyard must be inspected every three months. Inspections must be noted in an inspection register. The register must outline the state of the graveyard during each inspection. Reports on damages to any of the graves or to the graveyards'

(fence, wall, gate) must be followed with the necessary maintenance work. Maintenance work must be recorded in in the inspection register.

- The graveyards must be kept tidy from any invader weeds and any other refuse.

The significance of any possible impact on the graveyard after a management program has been put in place will be low (Table 9).

Should possible GY02 be encountered in the future the same mitigation measures as those outlined for GY01 must be applied for this possible graveyard.

Mitigating the impact on the historical house

The historical house may not be affected by the Meletse Iron Ore project or may not be renovated *prior* to the investigation of the residence by a historical architect in good standing with the SAHRA. Aquila or the historical architect has to acquire a demolition permit or a permit for the renovation of the structure from the SAHRA after the historical residence has been documented by the historical architect. Only hereafter may the historical residence be altered (demolished, renovated) as a result of the Meletse Iron Ore project.

The significance of any possible impact on the historical house after renovation and re-use will be low (Table 10).

General: disclaimer

It is possible that the heritage survey may have missed heritage resources in the project area considering the difficult topography and physical challenges that the project area poses as well as the size of the project area. It is possible that undetected heritage resources still may occur as a result of the fact that archaeological remains such as settlement or metal working debris may occur beneath the surface of the earth; that the heritage resources are unmarked or inconspicuous such as informal graves; that archaeological remains such as low stone walls or settlement and metal working debris may be covered by vegetation or that the author (archaeologist) and his colleques or companions may have failed to recognise or to observed heritage resources.If any heritage resources of significance are exposed during the Meletse Iron Ore Project 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 Archaeologists (ASAPA) should be notified in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from the SAHRA to conduct the mitigation measures.

CONTENTS

1 INTRODUCTION

Aquila Steel (S Africa) (Pty) Ltd (Aquila) proposes to establish an open cast iron ore mine referred to as the proposed Meletse Iron Ore Project on the remainders of the farms Randstephne 455KQ and Donkerpoort 448KQ in the Local Thabazimbi Municipality in the Waterberg District Municipality in the Limpopo Province of South Africa.

This document contains the report on a Phase I detailed Heritage Impact Assessment (HIA) study which was done for the proposed Meletse Iron Ore Project near Thabazimbi in the Limpopo Province of South Africa**.** The Limpopo Province has a rich heritage, comprised of remains dating from the pre-historical to the historical (or colonial) periods of South Africa. Pre-historical and historical remains in the Limpopo Province therefore form a record of the heritage of most groups living in South Africa today.

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), occur in the Limpopo Province (see Box 1, next page).

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 paleontological 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 paleontological 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;
(b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
(c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
(d) 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) 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

2 DETAILS OF THE SPECIALIST

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 excavated more than twenty LIA settlements in North-West and twelve IA settlements in the Lowveld and has mapped hundreds of stone walled sites in the North-West. 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

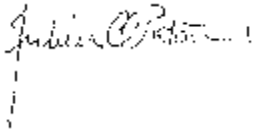
•all the particulars furnished by me in this form are true and correct;

•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.



Private Consultant

15 July 2015

Signature of the Commissioner of Oaths:

4 TERMS OF REFERENCE

Aquila's proposed development of the proposed Meletse Iron Ore Project near Thabazimbi may have an influence on any of the types and ranges of heritage resources ('national estate') as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999). In order to comply with Section 38 of the National Heritage Resources Act (No 25 of 1999), Aquila requires knowledge of the presence, relevance and significance of any heritage resources that may be affected or influenced by the proposed Meletse Iron Ore Project.

Aquila needs this information in order to take pro-active measures with regard to any heritage resources that may be affected by the proposed mine development project. As a result, Shangoni Management Services (Pty) Ltd, the company who is responsible for undertaking the required Scoping and Environmental Impact Reporting (S & EIR) process for the Meletse Iron Ore Project, therefore commissioned the author to undertake a Phase I detailed Heritage Impact Assessment (HIA) study for the project area.

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

- To determine if any of the types and ranges of heritage resources (the 'national estate') as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur in the project area and, if so, to establish the significance of these heritage resources.
- To establish the level of significance of any possible impact on these heritage resources.
- To propose appropriate mitigation measures for those types and ranges of heritage resources that may be affected by the proposed Meletse Iron Ore Project.
- To (apart from the above) describe, explain and contextualize the significance of the landscape qualities and intangible heritage of the area.

5 THE PROJECT AREA

5.1 Location

The proposed Meletse Iron Ore project is located on the remainder of the farms Donkerpoort 448KQ and Randstephne 455KQ approximately 30km east of Thabazimbi in the Local Thabazimbi Municipality in the Waterberg District Municipality in the Limpopo Province of South Africa. The project area is located north-east of Zandrivierspoort in an extension of the Vlieëberge on the Meletse mountain and its foothills approximately 10km to the south of the Marakele National Park. The project area's southern perimeter coincides with the Rooiberg-Thabazimbi-Alma dirt (2427DA Zandrivierspoort; 1:50 000 topographical map and 2426 Thabazimbi; 1:250 000 map (Figure 1).

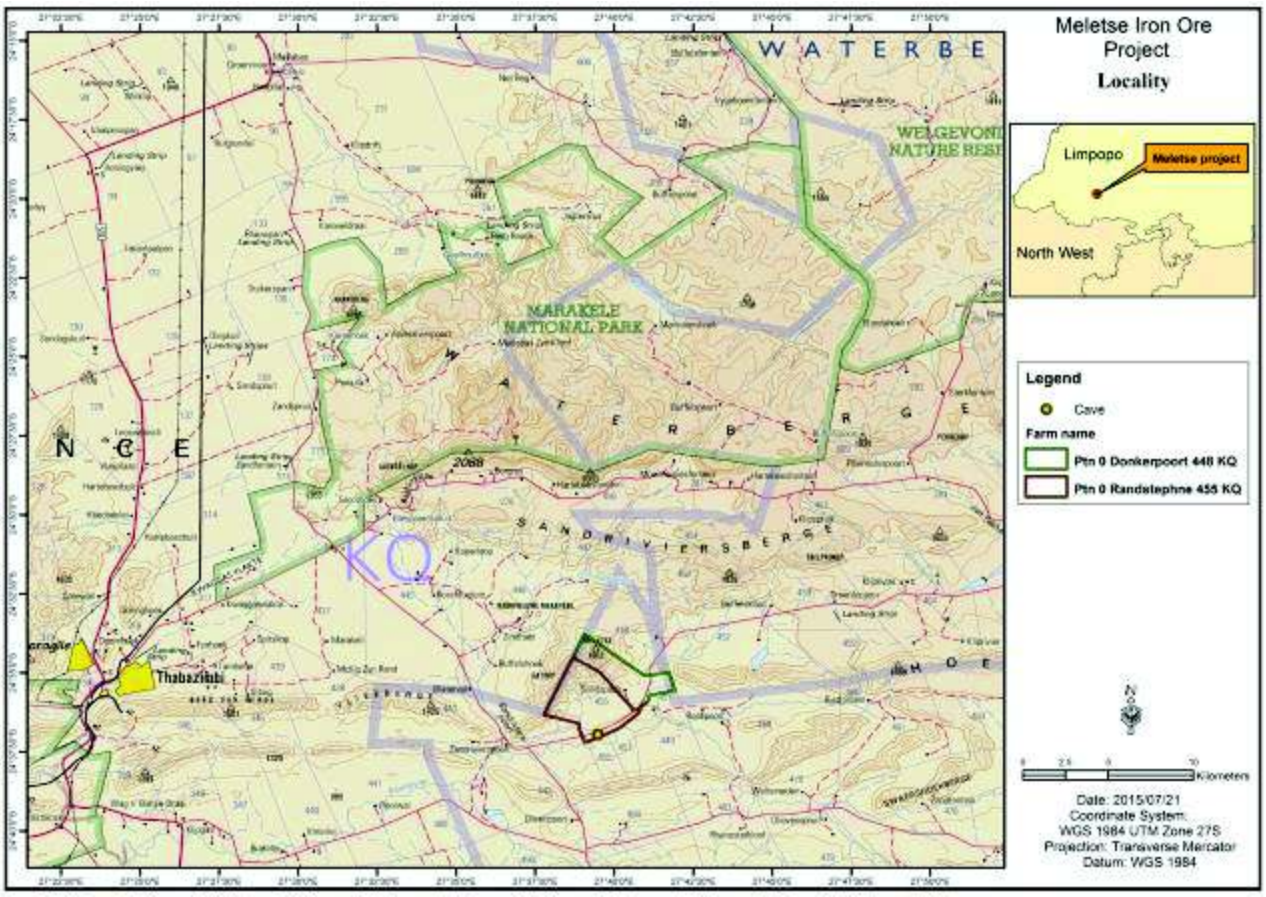


Figure 1- Regional location of the Meletse Iron Ore project on Randstephne 455KQ and Donkerpoort 448KQ to the east of Thabazimbi in the Limpopo Province (bottom image).

5.2 The nature of the project area

The topography of the proposed mining area is very rugged. The targeted Meletse iron ore deposit is situated in the Meletse mountain ridge. The proposed mining site corresponds with the Savannah Biome and more particularly with the Central Bushveld Bioregion. It incorporates three ecological types.

The Waterberg Mountain Bushveld occurs on higher slopes and on the rocky middle foot slopes of the mountain range. This vegetation type is predominantly confined to the northern half of the site and is restricted to the Waterberg Mountains including a number of outlier hills and ridges of the Vlieëberge and Boshoffsberge near Thabazimbi (Pachnoda 2014). Archaeological sites in this part of the project area included mines and at least one stone walled site which are located at high altitude in order to exploit rich, weathered haematite deposits. The majority of sites consisting of Late Iron Age stone walled settlements are located on the higher, rugged ridges and the lower foot slopes of hills. Some of these sites are sited in close proximity of valleys and shallow dongas.

Central Sandy Bushveld vegetation is confined to a small area on the eastern perimeter of the project area. It extends in a broad arc south of the Springbokvlakte from the Pilanesberg in the west through Hammanskraal and Groblersdal to GaMasemola in the east. This vegetation occurs in low undulating areas and is dominated by tall, deciduous woodland on deep sandy soils (Pachnoda 2014). A limited number of stone walled settlements and a site on a high ridge without stone walls were encountered in this part of the project area.

Western Sandy Bushveld vegetation is dominant on the low-lying areas of the project area and is typical of the sandy flats and undulating plains west of the Waterberg Mountains and north towards Steenbokpan. The vegetation structure varies from a tall open canopy to low woodland dominated by broad-leaved and microphyllous species on soils underlain by arenite and sandstone (Pachnoda 2014). At least one Iron Age settlement with smelting debris and without stone walls were encountered in the tract of a sandy road in the lower part of the project area.

The lower southern laying part of the project area is an outstretched undulating plain with Vaalbos (*Terminalia sericea*) in valleys and on deeper sands on plateaux. Gatkop Cave as part of an underground dolomitic structure is situated at the foot of a low hill ('kopje', hence 'Gatkop') in the lower laying part of the project area in close proximity to the Rooiberg-Thabazimbi-Alma dirt road. Grass veld in the lower laying part of the project area is moderately or well developed and include pristine stretches of grass veld. However, large surface areas on the valleys are covered with dry-land agricultural fields and those which currently are not planted with crops serve as fertile footholds for a variety of invasive weeds (Pachnoda 2014).

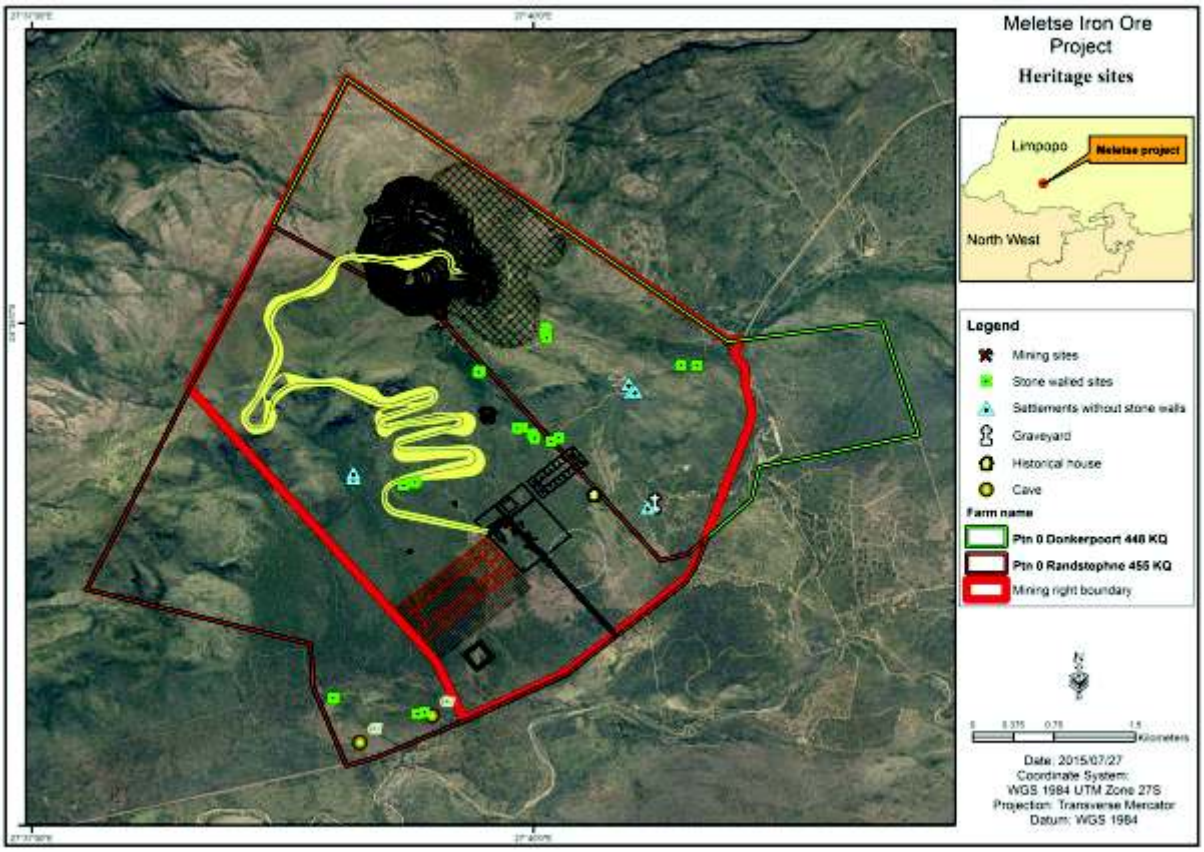


Figure 2- The Meletse Iron Ore Project on Randstephne 455KQ and Donkerpoort 448KQ to the east of Thabazimbi in the Limpopo Province. Note the location of Gatkop Cave to the south and outside the mining area (bottom image).

5.3 The nature of the Meletse Iron Ore Project

Aquila proposes to develop an opencast iron ore mine on the remainder of the farms Donkerpoort 448KQ (838ha) and Randstephne 455KQ (1301ha) situated approximately 30 km to the east of Thabazimbi in the Limpopo Province. The Meletse Iron Ore Project will be established by means of conventional truck and shovel mining techniques. The topsoil (seed bearing soil) will be stripped prior to mining and placed on a separate dump to be used during rehabilitation. The overburden and waste rock material will be stripped and dumped on the waste rock dump that will be established on a contour 1 620m above sea level on the south-eastern side of the open cast pit. During the final years of the open pit an in-pit waste rock dump will be established in the north-eastern section of the open pit.

The mine infrastructure includes the following developmental components, namely:

- Access and haul roads to the plant area and other mining infrastructure;
- Crushing and screening plant, Dense medium separation (DMS) plant area;
- Pipeline from the water supply to the reservoir;
- Change rooms;
- Stores;
- Offices;
- First aid bay;
- Visitors parking;
- Weigh bridge;
- Salvage yard;
- Security;
- Access control;
- Diesel workshop;
- Boiler workshop;
- Wash bay;
- Doser workshop;
- Tyre workshop;
- Electrical workshop;
- Fuel storage;

- Lab and core shed;
- Hazardous and general waste storage area;
- Sewer treatment plant serving approximately 4471 people;
- Blasting and explosive stores;

It is anticipated that the life of mine will be at least 18 years but this may well be extended as a result on on-going exploration.

A road for the transportation of iron ore from the Meletse Iron Ore project will also be established. The road will run from the mine for approximately 60km to end at the Chromedale Siding SSW of Thabazimbi.

Electricity is available from the Eskom transmission network either 22kV or 132kV overhead transmission lines (BID, Meletse Iron Ore Project). Possible water sources include groundwater extraction or alternatively taking water from the Crocodile River that is approximately 40 km away.

General and hazardous waste will be stored in skips with a concrete base. All general waste will be taken to the Thabazimbi landfill site and hazardous waste to a licensed facility such as Holfontein. Oil will be taken to the oil recycling facility in Thabazimbi.

6 APPROACH AND METHODOLOGY

This Phase I detailed HIA study was conducted by means of the following:

6.1 Field survey

The field survey for the proposed new open cast mine and for the proposed waste rock dump, which both are located at heigh altitude on Meletse Mountain, was conducted by means of following the exploration roads that occur on this part of the mountain. The haul roads were also investigated by means of following the exploration roads, some of whom will eventually became part of the haul roads. Lower parts of the project area were surveyed with the help of farm and mine roads.

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

The main routes which were followed with a vehicle during the survey were recorded with a mounted GPS instrument. Pedestrian surveys were undertaken from the main pathway. Rugged terrain and dense vegetation occur in all parts of the project area

and at times hampered archaeological visibility during the foot surveys although the fieldwork was done in the middle of the winter and vegetation has receded to some extent (Figure 3).

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

Fieldwork was done on 11 July 2015 and from 14 to 17 July 2015 and again from 20 to 24 July 2015. The author was assisted on these days by individuals such as a geologist, farm manager, archaeological assistant, and farm workers all who are (except the assistant) well acquainted with different parts of the project area.

Google imagery was used as a supplementary source next to the fieldwork to determine the possible presence of sites. Ecological indicators such as alternations in vegetation patterns; open or bald spots in the veld covered only with grass or extremely dense patches of vegetation were searched as possible indicators for settlements such as stone walls or as areas where metal working took place. The foot survey proved that stands with sickle and quarry bush almost always were assiociated with earlier human interference of some kind.

The description of the fieldwork survey (Part 6.1) further illuminates the nature and character of the project area by means of descriptions and photographs.

6.2 Databases, literature survey and maps

Databases kept and maintained at institutions such as the Provincial Heritage Resources Agency (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 have been identified during earlier heritage surveys in or near the Project Area.

A number of heritage impact assessment studies have been done near the Project Area (see 'Part 12 Select Bibliography').

Literature relating to the pre-historical and the historical unfolding of the project area reviewed (see Part 7, 'Contextualising the Project Area' and Part 12 'Select Bibliography').

In addition, the Project Area was studied by means of maps and imagery on which it appears (2427DA Zandrivierspoort; 1:50 000 topographical map and 2426 Thabazimbi; 1:250 000 map.

6.3 Spokespersons consulted

Employees in the service of Aquila Steel who are acquainted with the project area assisted the author during fieldwork. Thomas Mothloki a local resident who was born in the project area longer than seventy years ago was consulted regarding the possible presence of heritage resources. Jacques Badenhorst, geologist with Aquila Steel surveyed large portions of the project area on foot and were acquainted with some of the settlements that weer recorded in the project area (See 'Part 11, Spokespersons consulted').

6.4 Assumptions and limitations

It is possible that the heritage survey may have missed heritage resources in the project area considering the difficult topography and physical challenges that the project area poses as well as the size of the project area. It is possible that undetected heritage resources still may occur as a result of the fact that archaeological remains such as settlement or metal working debris may occur beneath the surface of the earth; that the heritage resources are unmarked or inconspicuous such as informal graves; that archaeological remains such as low stone walls or settlement and metal working debris may be covered by vegetation or that the author (archaeologist) and his colleaques or companions may have failed to recognise or to observed heritage resources.

If any heritage resources of significance are exposed during the Meletse Iron Ore Project 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 Archaeologists (ASAPA) should be notified in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from the SAHRA to conduct the mitigation measures.

6.5 Some remarks on 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 man-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 (refer to Figure 3).

- 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.

7 CONTEXTUALISING THE PROJECT AREA

The pre-history and history of *homo sapiens* in the Waterberg is closely linked to natural phenomena and features such as the mountains, plains, minerals, grass veldts and water resources in the district. Rainfall, seasonal fluctuations in temperatures and general climatic conditions were not constant and many of these fluctuations challenged human adaptation as it offered opportunities and constraints to bands of hunter-gatherers, complex farming communities, specialists such as metal workers or entrepreneurial traders in the past. Considering the depth of time associated with human occupation of the district, namely three million years in the Makapan Valley, it can be accepted that fluctuations over this time span were many, different in various eco-zones and probably eventful, if not disastrous, to human groups in this region (Pistorius 2010) (also see Part 12, 'Select Bibliography').

The following overview of pre-historical, historical and cultural evidence indicates the wide range of heritage resources which do occur in the southern Waterberg.

7.1 Stone Age and rock art sites

Stone Age sites are marked by stone artefacts that are found scattered on the surface of the earth or as parts of deposits in caves and rock shelters. The Stone Age is divided into the Early Stone Age (ESA) (covering the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (MSA) (referring to the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (LSA) (the period from 22 000 years ago to 200 years ago) (Inskeep 1978).

MSA and LSA (last millennium AD) hunter-gatherers settlements are associated with the mountainous and flatter areas of the Waterberg. Many of these sites are associated with rock shelters and overhangs. The Olieboompoort rock shelter with MSA and LSA assemblages on Waterval 601, next to the Rietspruit in the Waterberg, serves as a chronological marker for the Stone Age in the Waterberg. This site also holds rock paintings. The end of the MSA in the Waterberg is probably close to 35 000 years BP (before present). The Waterberg may have remained

unoccupied for a long period between the MSA and the LSA (Van Der Ryst 1998 cited in Pistorius 2010).

Stone Age sites were recorded on Vellefontein, Blaauwbank and Hartebeesfontein near the Rooiberg. MSA artefacts are probably widespread across the Springbokflats, mainly manufacured from dolerite, felsite and quartzite derived from the Rooiberg. At Tuinplaas, part of the skeleton of a Homo Neanderthalenis was found decades ago (Wells 1972 cited inPistorius 2010).

Although South African rock art in all regions share fundamental commonalities, differences in regions illustrate distinct meanings to specific and also temporal themes, e.g. specific animals, postures or handprints. The central motif for rock art in the Waterberg is handprints while paintings of sheep are also general (but uncommon elsewhere in the Limpopo Province). Most of the Waterberg rock art is associated with the LSA which implies that most of the rock art in the Waterberg may have been done within the last millennium AD. There is evidence that some San rock painting sites were used as ritual sites, such as for rain making, by later farming communities.

Stylistic attributes specific to the Waterberg include the so-called Waterberg posture, the spread eagled or saurian motif and the emphasis on animals such as the red hartebees. The 'Waterberg posture' usually depicts a male in profile with only one leg and one arm, short, and angled out and upwards. The individual's penis also protrudes upwards and outwards like its arm (Laue 2000 cited in Pistorius 2010).

7.2 Iron Age remains

The Iron Age is usually divided into the Early Iron Age (EIA) (covers the 1st millennium AD) and the Later Iron Age (LIA) (covers the first 880 years of the 2nd millennium AD) (Huffman 2007). Iron Age activities in the Waterberg only started with the arrival of the first farming communities who settled on the plains around the northern edge of the Waterberg at Diamant in AD570 (Pistorius 2010).

The southern Waterberg near Rooiberg-Thabazimbi and perhaps Leeuwpoort further south is well endowed with Iron Age remains, particularly with regard to evidence for stone wallled sites and metal working. Geologically, this area is host to minerals such as iron, copper and tin which were smelted by Iron Age specialists during the pre-colonial period. The Iron Age is also associated with agro-pastoralists or farming communities who lived in semi-permanent villages during the last two millennia (Mason 1962).

The first African farmers in the Waterberg settled towards the more open parts of the Waterberg plateau. They were the people of the Eiland Tradition (so-called according to their pottery's decoration and style). Eiland settlements date from the first centuries of the second millennium AD, namely 1100AD to 1300AD, and are usually characterised by the absence of stone walls and the presence of a distinct decorated pottery. One of the largest and best preserved EIA Eiland sites, which is located on a hilltop with terraces along the hillside, occurs on Kirstenbosch 497LR in the northern Waterberg. No stone walls are associated with this site which dates from the middle to the late 13th century AD. Clusters of LSA tools near the perimeter of the site reflects the interaction between Stone Age and Iron Age people (Pistorius 2010).

The appearance of Moloko pottery towards the middle of the second millennium AD in the Waterberg is associated with the arrival of the ancestors of the Sotho. A number of settlements dating from AD1600 were recorded near the Motlhabatsi River. From this time a number of stone walled sites appear in the Waterberg itself. Some seems to be defensive in nature as they occur along cliff edges and are surrounded with perimeter walls such as Bobididi, Buffelsfontein and Malore Hill. Some of the sites may be associated with the arrival of the ancestors of the Nguni-derived Ndebele and with the Batlhalerwa who originated from Zimbabwe (Pistorius 2010).

Reports that metals such as iron, tin and copper were mined and smelted in the Thabazimbi-Rooiberg area are nearly one hundred years old (Bauman 1919; Trevor 1912; Wagner & Gordon 1929). However, very little is known about the nature, extent and character of Iron Age settlements and people in this part of the southern

Waterberg. This knowledge on pre-historic mining and smelting was compiled by curious miners, geologists and metallurgists during the early part of the twentieth century and this knowledge is largely technical and provides very little insight into the chronology, settlements or the identity of the miners and metal workers.

Two archaeological surveys were conducted in the Thabazimbi area, namely in the west where Kumba's iron ore mine is located and towards the Rooiberg Mountains in the east. Evidence for pre-historic iron smelting and habitation was recorded at more than ten settlements in the Ben Alberts Nature Reserve and in the Kumba mining area, south of Thabazimbi (Miller 2007-2012). During the earlier second survey along the southern fringes of the Boschoffsberge and along the Rooiberg and Sandrivier Valleys, south and east of Thabazimbi, sixty three sites were recorded. These setllements represent four classes of pottery, namely the Rooiberg Units 01 and 02 which belong to the Eiland Tradition (AD900 to AD1200), Rooiberg Unit 03 which belongs to the LIA (AD1500) and Rooiberg Unit 04 which is attached to a LIA phase which is associated with stone walled settlements (AD1700-1800) (Hall 1981).

Tsetse fly in the Thabazimbi area was probably not uncommon considering the names 'vlieggepoort' in the Vlieëberg Mountains and was only eradicated after the runderpest in 1894. The presence of tsetse fly may have inhibited opportunities for livestock herding amongs Iron Age communities. This may have promoted mining, working and trading of minerals such as iron, tin, copper and lead in the region considering the abundance of these minerals in the area. Mining of minerals occured near the banks of the Crocodile River on the farm Sweet Home 233, at the Rhino Andulisite Mine near Thabazimbi and on Zandfontein 394 near the Matlabas River.

The area stretching north and north-westwards from Thabazimbi towards Sentrum may have been scarcely occupied during the LIA and Historical Period, and possibility at times during the pre-historical period as well. This area was inhabited from as early as 1875 by the Vaalpense a small group of people (also known as Kattea, Malesa, Masarwa, etc.) who were a mixture of Negroied and San people (Van Schalkwyk 1985). The Vaalpense were impoverished nomadic hunters and herders who did not occupy permanent settlements that have left traces on the

landscape. They became subordinate to the Seleka, Langa Ndebele and colonial farmers who employed some of them as labourers (Pistorius 2010).

The survey in the southern Waterberg also led to the recording of Gatkop Cave a sizeable dolomitic cave system settled in a gently sloping foot hill of the Meletse mountain range. The cave site was described as '… a place of refuge … in which the large entrance chamber to the cave still preserves a series of wooden kraals and much pottery (Hall 1981:14). According to local tradition Gatkop Cave served as refuge against Matabele (Ndebele) raiding parties in this part of the former Transvaal province (AD1829 to AD1827).

During an earlier Phase 1 Cultural Heritage Resources survey for the Meletse Iron Ore Project it was also stated by (Miller 2014) that Gatkop Cave may be a site of high cultural heritage significance and that the cave may also have high palaeontological heritage significance.

According to (Equiperspectives 2014:55) Gatkop and other caves in close proximity to the mining rights area '... have great cultural significance for indigenous groups in the area'. The caves as well as Meletse mountain is '... a sacred place where the traditional healers go to consult with the ancestors. ... It is important to note that it is not only the cave that is regarded as sacred, but the Meletse mountain as well. The cave is where they enter the mountain to consult with the ancestors'. However, the social impact assessment report also mentions that literature on Tswana traditions identify sacred sites by the name 'Madimatla' and that Gatkop Cave may not necessarily be the Madimatla referred to in the iterature. The report recommends that this must be investigated further. Consequently, an anthropological investigation of the significance of Gatkop Cave was commissioned by Shangoni Management Services which resulted in two reports (Van Vuuren 2014a, 2014b).

7.3 The Historical Period

Historical towns closest to the project area include Thabazimbi, Bela Bela and Modimolle. Colonial presence in the Waterberg only became more marked from AD1870 onwards although it is estimated that there were less than two hundred

white residents in the Waterberg by AD1900. First generation homesteads, or 'hartbeeshuise' constructed with clay or clay bricks and thatched roofs, have all disappeared by now and have been replaced with second and third generation farm residences (Naude 1990, 2004). Colonial family graveyards as well as informal graveyards for labourers, are scattered throughout the area (Pistorius 2010).

Thabazimbi is the Tswana word for 'mountain of iron'. The exceptionally rich iron deposits at the Vlieggepoort defile was discovered by J.H. Williams in 1919. The government bought the ore body and Iscor started with production in 1931. The township of Thabazimbi was mainly established for the employers of Iscor. It was laid out on the farm Kwaggashoek and officially proclaimed on 4 May 1953 (Erasmus 1995).

A hot spring serves as the reason for Bela Bela's existence. Tswana who lived in the area in the nineteenth century knew the spring and called it Bela Bela ('he who boils on his own'). The first whites who saw the spring were the hunters Jan Grobler and Carl van Heerden in the 1860's. Van Heerden later built his farm around the spring and drained the swamp that formed over the centuries. The healing properties of the spring spread and people from far and wide visited the spring. President T.F. Burgers visited 'Het Bad' himself in 1873 and in the same year the ZAR bought the spring which was developed into a public spa. Gradually a settlement known as Warmbad grew around the spring. The settlement was proclaimed a town on 14 December 1882. The name Hartingsburg for the town never gained currency and the name Warmbad was official bestowed on the town when it recieved municipal status in 1932. The Limpopo Government changed the name to Bela Bela (Erasmus 1995).

Historical beacons in the area include a blockhouse which served in the line of blockhouses which stretched from Naauwpoort in the Magaliesberg to Pietersburg during the Anglo Transvaal War (1899-1902) . A Voortrekker cemetry lies along the Thabazimbi road (Erasmus 1995).

The village of Modimolle (Nylstroom) was laid our on the farm Rietvlei in 1866. Nylstroom is also known by some of the locals as Mogalakwena('fierce crocodile'). A group of Voortrekkers known as the 'Jerusalemgangers' who arrived in the area in

1886 named the north-flowing river – the headwaters of the Magalakwena flowing to the Limpopo River – the Nile River beliefing that following its course and after crossing Africa and Egypt it will bring them to the holy land. Kranskop (Modimolle), a chunk of the Rooiberg which shifted far to the east now sitting on the eastern shoulder of the N1, is the place from where the town of Nylstroom derives its name. This mountain is considered a holy place by some of the local people and the name of Nylstroom was changed taking Modimolle in its place (Erasmus 1995).

Historical beacons in town include the residence of Advocate J.G. Strydom the Prime Minister from 1954 to 1958 who lived in this Cape Dutch house which was designed by Gerard Moerdijk. The historic Waterberg Reform Church was built in 1889 and constitute a historical townscape together with a number of other historical residences that reflects the heritage character of Nylstroom (Erasmus 1995).

Known historical beacons in the Rooiberg close to Bela Bela and Modimolle includes Buyskop and Kranskop (Modimolle). Buyskop, a foothills of the Rooiberg on the outskirts of Bela Bela served as home for Coenraad De Buys, notoriuos nineteenth century traveller, hunter and adventurer who dissapeared during one of his sojourns in the Limpopo Valley and whose decendants today live in Buysdorp in the Soutpansberg (Pistorius 2010).

8 THE PHASE I DETAILED HERITAGE IMPACT ASSESSMENT

8.1 The fieldwork survey

The field survey for the proposed Meletse Iron Ore project posed exceptional challenges considering the topography and the nature of the terrain where the open cast mine and its associated infrastructure will be established. The project area stretches from the Alma dirt road on level ground to the Meletse Mountain's highest peak 1 780m above sea level in the southern Waterberg range. The project area therefore rises approximately 800m in height from ground level in the south to the highigest peak in the Meletse mountain in the north. This coincides with vegetation which varies from savannah and dense woods on flats in the south to wooded valleys along steep hill slopes in the middle of the project area to an open dispersed vegetation cover on higher plateaux in the upper part of the project area.

Although the higher peak of Meletse mountain protests against any attempt of occupation or utilization by humans in the past, except perhaps under periods of stress when height may have provide shelter and protection for small groups of refugees, three mines were recorded on the higest slope and crest of Meletse. This part of the mountain is composed of a rich iron content and was thoroughly surveyed and mapped by a team of geologists who recorded one mine adit at the crest of the mountain and two additional mine adits along the higest slope of the mountain.

The fieldwork survey focussed on the footprint for the proposed new open cast mine, the proposed haul roads and all other infrastructure which is associated with the mine development project. It must be emphasised that a total coverage of areas such as the open cast pit which covers the higest peak of the mountain including some of its magnificent krantzes and steep mountain slopes; a steep, deep ravine against the slope of the mountain where rock will be dumped and stretches of most of the highest descending winds for the haul roads running down the mountain's slope was not possible by means of a normal pedestrian survey.

The following photographs illuminate the nature and character of the project area as well as some of the footprints of the proposed mine development project.

Figure 4- The project area stretches from level ground for more than 800m to the top of Meletse Mountain where iron ore will be mined by means of open cast mining (above).

Figure 5- Although situated several hundreds meters above sea level at least three mine pits occur on and near the summit of Meletse Mountain (above).

Figures 6 & 7- Prospecting roads along the highest slopes of Meletse. Some will partly be utilized for haul roads which descend hundreds of meters along the southern slope of the mountain to mine infrastructure on level ground (above and below).

Figures 8 & 9- The higher foot slope of Meletse Mountain hold a limited number of settlements the stone walls of which are barely visible in tall grass. Sickle bush serves as an ecological indicator enabling identifying these settlements (above and below).

Figure 10- Slopes on foothills in the project area such as the one in the background on Donkerpoort 448KQ hold stone wallled settlements albeit in low numbers (above).

Figure 11- Flat areas covered with thick clumps of trees and tall grass hold settlements without stone walls and with metal working debris (above).

Figure 12- Flat outstretched pieces of land on Randstephne 455KQ comprise banks composed of ferricrete and banded iron stone with no evidence for any heritage resources (above).

8.2 Types and ranges of heritage resources

The Phase I detailed HIA study for the proposed Meletse Iron Ore project revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in and near the Project Area, namely:

- Prehistorical and historical remains consisting of mining sites and stone walled settlements, some with evidence for metal working.
- Gatkop Cave in a dolomitic underground cave system which is an archaeological site with living heritage significance and which currently is used by traditional healers.
- An early twentieth century Cape Dutch styled residence.
- An informal graveyard, and a second possible graveyard which has not been identified as it could not be located in the area pointed out.

All the heritage resources were geo-referenced and mapped (Figure 13; Tables 1-6). The main structure sites were geo-referenced. However, in some of the individual stone wallled settlements all structures and features were geo-referenced

The significance of the heritage resources is indicated as well as the significance of any possible impact on those heritage resources which will be affected by the footprint of the proposed Meletse Iron Ore project. (Tables 1-6).

Mitigation measures and management measures are outlined for those heritage resources which will be affected directly or indirectly by the proposed Meletse Iron Ore project and for those heritage resources which will remain unaffected in the project area.

The Phase I detailed HIA study is now briefly discussed and illustrated with photographs.

8.2.1 Prehistorical and historical remains

The prehistorical and historical remains refered to here include mining sites and settlements. The majority comprise settlements which were constructed with dry stone walls or which were represented by some stone features whose purpose or function can not be interpreted or explained if not invetigated further. This category of heritage sites also includes sites without stone walls but with evidence for metal working or any other remains or evidence which sugggest some form of human intervention in the past.

The settlements with stone wallls date from the eighteenth century whilst the sites without stone wallls may be older. Accurate chronological dates for these settlements can only be established by collecting archaeological remains such as diagnistic potsherds and dating material (e.g. charcoal) from these settlements by means of excavations.

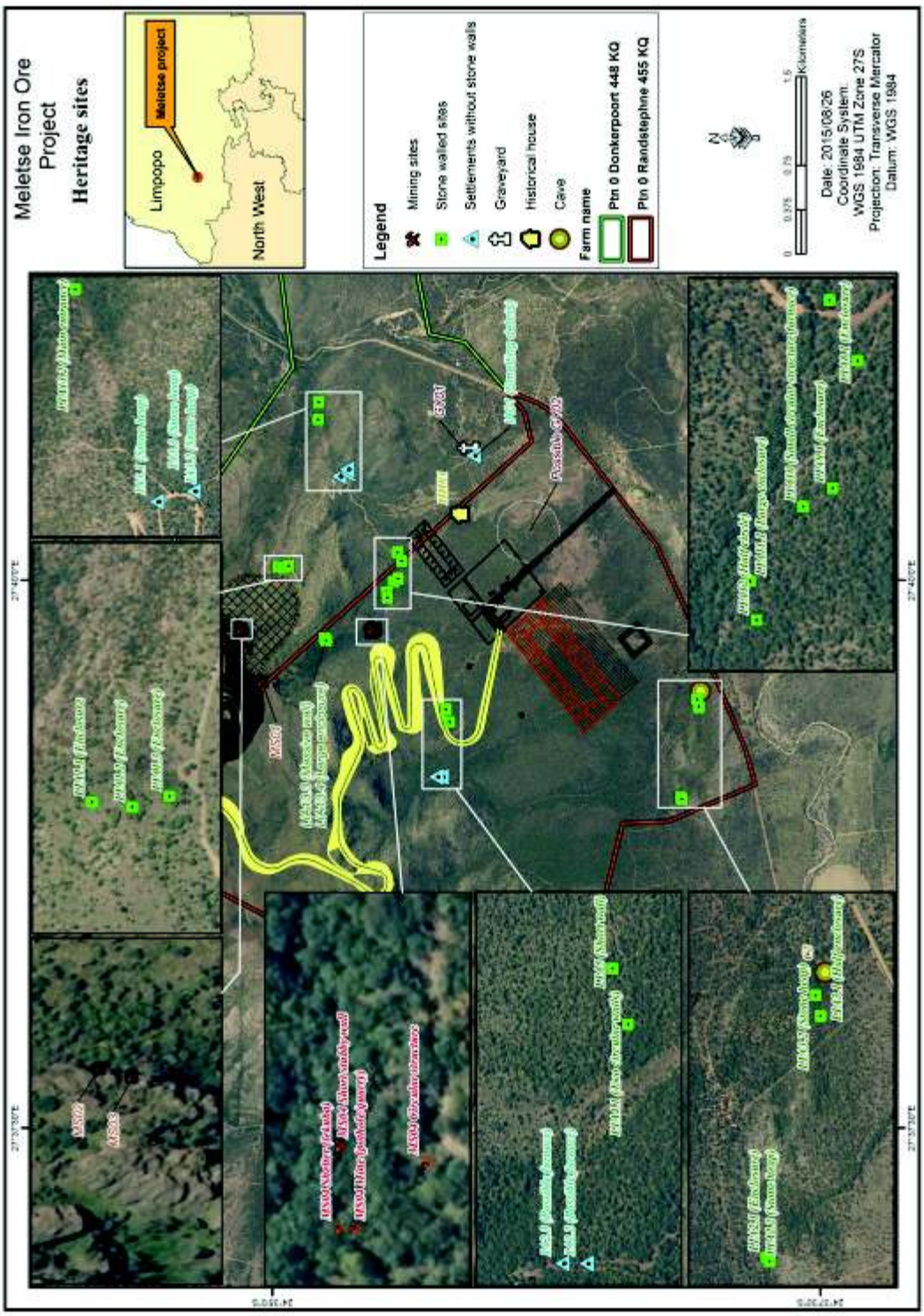


Figure 13- The proposed Meletse Iron Ore Mine's footprint on Randstephne 455KQ and Donkerpoort 448JQ in the southern Waterberg mountain range. Note heritage resources such as Gatkop cave, mining sites, stone wallled and other settlements, graveyards and a historical house in and near the project area. Not all stone walled sites (or individual features of sites) are indicated as some of the sites fall outside the project area. Gatkop cave also occurs outside the mining area (see Figure 2).

8.2.1.1 Mines

At least three shallow mines were documented along the highest slope and crest of Meletse Mountain (MS01, MS02 and MS03). These sites comprise shallow adits which were dug into the mountain, most probably to collect haematite, also commonly known as ochre (*letsoku*) amongst pre-historic and historical people. A fouth mine in the form of an elongated pothole (MS04) occurs next to a deep donga at a much lower altitude along the southern side of Meletse.

The mining techniques that were utilized to collect the haematite do not seem to difffer from Iron Age mining techniques that were widely employed by Iron Age miners to collect copper, tin or iron ores whether it was in the Dwarsberg (copper, North West) or in Loolekop (copper, Limpopo) or elsewhere in Africa. Two adjoining adits (MS01, MS02) along the slope of Meletse were dug into the mountain's side whilst the adit near the mountain's crest (which the author observed, MS03) was dug into the mountain. All three adits are relatively shallow. No a substantial amount of haematite was removed from the mines.

Figure 14- Shallow adit close to the crest of Meletse Mountain which probably served as a mine from which heamatite (ochre) was mined (above).

The mining techniques probably comprised the chisseling of haematite from the mother lode with the aid of chisels and hamerstones, such as the one which occurs on the edge of MS03. The miners may have illuminated the deep parts of the adits with torches. This was achieved by means of burning the 'bobbejaanstert' plant as the Iron Age copper miners of Musina used to do. It is conspicous how this plant proliferates along the edge of this mine.

Ochre was used for bodily decoration, ceremonial and medicinal purposes and also to decorate pottery and dwellings. It may even have been smelted to manufacture iron depending on its metallurgical qualities.

Figure 15- Hammer stone on the edge of the shallow adit close to the crest of Meletse Mountain. The hammer stone was used together with a chisel to break the haematite (ochre) from the wall of the adit (above).

The fourth mine (MS04) is in the form of an elongated shallow quarry or pan with a handle occurs along a deep donga at much lower altitude than the three adits on top

of Meletse. This mine is associated with a short stubby wall and at least two other stone structures with no clear function or purpose.

One of the stone structures is circular in shape and the second comprise two adjoining roughly circular structures and composed of many flat stones. These structurers may have served as shelters (*makuba*) which were occupied by persons practising some kind of metal craft, e.g. iron smithing, copper melting, etc..

This open mine or quarry (MS04) may have been utilised to obtain a mineral different than the haematite which was mined at the other three mines higher up the slope of Meletse.

Figure 16- Large shallow quarry in the form of a pan with a handle was probably utilised as a mine to collect some kind of mineral during Iron Age times (above).

Figure 17- Collection of mostly large, flat surfaced rocks in two roughly discernable circles next to each other. These structures may have served as work places (*makuba*) where crafts people practised some kind of specialist work (above).

8.2.1.2 Stone wallled settlements

At least thirteen settlements and structures (LIA01 to LIA13) consisting of dry stone walls and structures composed with stone were recorded in the project area. All these settlements, except one, occur on the lower slopes of foothills on rocky, uneven terrain in the middle part of the project area. These settlements all probably date from AD1700 and some have evidence of metal working of some kind.

The spatial composition of these sites mostly comprise of one or more enclosures which are approximately 12m in diameter. These enclosures are sometimes associated with semi (or half) enclosures and in some instances with stone heaps or with a single small enclosure. No deposits are visible, except in two of these settlements (LIA01, LIA13). However, foilage covers most of these settlements which prevent a thorough investigation of these sites' surfaces.

Figure 18- Stone wallled site LIA01 comprises an enclosure and stone heap against the slope of a low hill (above).

Figure 19- A heap of stones which is associated with a single enclosure constitutes Site LIA02 (above).

Most of these settlements are located in thick woody areas and are not easy to detect.

At least three ‘settlements’ were mapped where large enclosures were absent. At one of the settlements stone structures were recorded that may be associated with possible furnaces (LIA10). At two others a single small enclosure was recorded to which was added a short piece of wall (LIA14, LIA15); a stone pile (LIA16); a stone wall (LIA17) and a site which was demolished during road construction (LIA18).

One of the stone wallled sites (LIA01) occur on a small plateau on a high altitude on Meletse mountain’s southern slope. This site is composed of three oval-shaped enclosures with diameters roughly measuring 7m. One of the enclosures is associated with a deposit consisting of black ash and soil which may be derived from metal working activities.

Figure 20- Site LIA01 is located on a small plateau below Maletse mountain’s crest and is associated with three enclosures and metal working debris comprising slag and virtrified tuyere tips (above).

Figure 21- Metal woring debris consisting of slagged tuyere tips and lumpy slag nodules are associated with Site LIA01. This settlement and its associated metal working activities occur high above ground level (above).

Figure 22- The stone wall of an enclosure which is barely visible between tall grass on the southern slope of Meletse (above).

Melting working debris comprising of virtrified tuyere fragments and tuyere tips as well as irregular lumps of slag which were exposed when an exploration road was constructed are also associated with this settlement.

The largest of the stone wallled settlements entails Site LIA13 which is situated between the foot of a low hill on Donkerpoort 448KQ and a donga. This settlement contain prominent stone walls, some of which may have served as an entrance leading to the site's interior, a large enclosure and some lesser stone structures. A prominent heap of slag and other metal working debris occur. A large broken hammer or anvil stone suggests that the metal working activities may have included the forging of iron.

Not all the Late Iron Age settlements are reflected in Figure 13, e.g. LIA14 to LIA18 are located on Randstephne 455KQ and to the west of the mining area. Individual structures and features in settlements, e.g. LIA3.3, LIA4.2, LIA8.3, etc. are also not indicated as not all the components in settlements were geo-referenced.

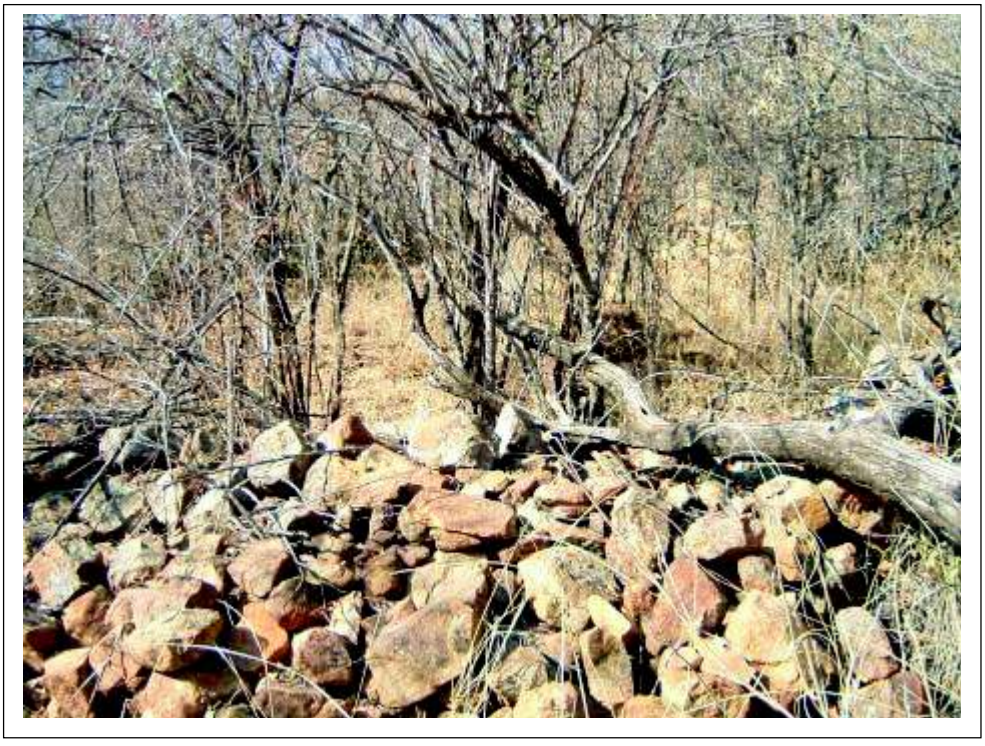


Figure 23- Site LIA13 is associated with heavy stone walls two of which may have served as entrance posts into the site (above).

Figure 24- A possible hammer or anvil stone which may have been used during a second stage of iron working, namely the forging of iron bloom into metal items such as spear heads, hoes, etc (above).

Figure 25- The prominent outer wall of Site LIA13 along the lower foot slope of a hill (above).

Figure 26- Metal working debris compriding of scatttered slag on the surface of Site LIA13 (above).

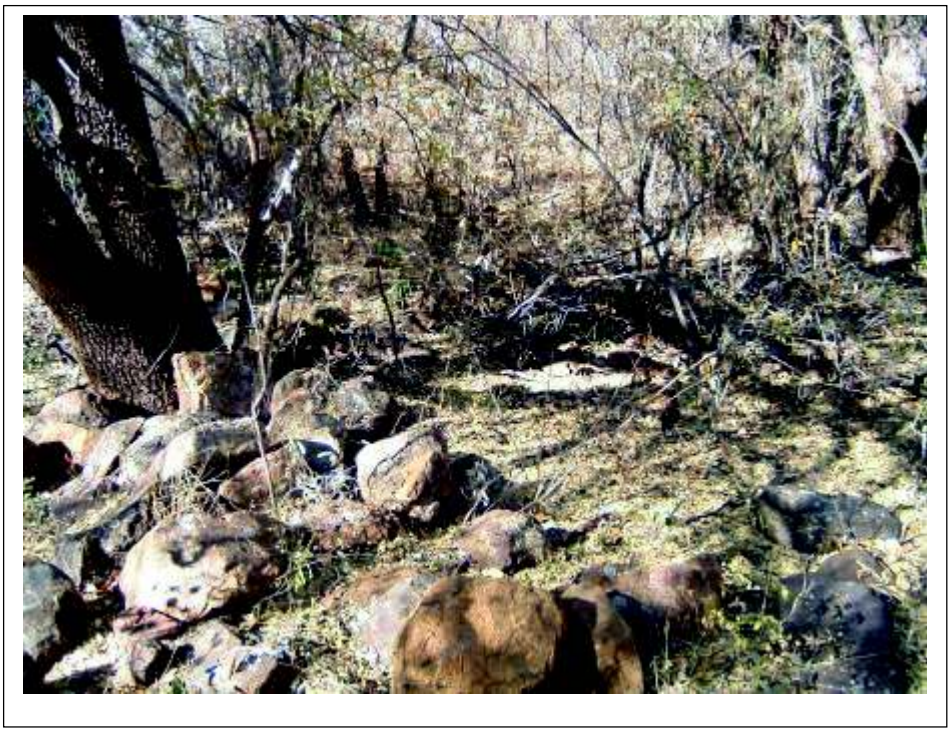


Figure 27- A simple stone walled site (LIA14) comprising of a single small enclosure to which was added a short wall (above).

8.2.2 Gatkop (Madimatla) Cave

Two caves approximately 600m from each other and part of the same geological occurrence occur on Randstephne 445KQ. Both openings are situated on a low hill ('kopje') which probably explains the Afrikaans name 'Gatkop' for the cave at the foot of this hill. The lesser well known cave opening with no name is located approximately 600m to the north-east of the main cave opening, on a plateau on Gatkop hill. A limited number of stone walls and feature are located near this cave opening (LIA01, LIA02 and LIA03).

The larger, main cave opening in the two dolomitic cave systems is known as Madimatla, a name mentioned in ethnographic sources and still being used by local and traditional healers who frequently visit the site (Van Vuuren 2014). The two cave systems are seperate, independent cavern systems although geologically identical (Seamark, personal communication).

Figure 28- Cave entrance in dolomitic crags leads into large chambers followed by an extensive underground tunnel system. The cavern system is penetrated to great depths by traditional healers and patients who also overnight in the labyrinth of caverns and caves (above).

The interior of the cave was not investigated by the archaeologist. The paleontological report describes the cave's interior as follows:

> 'The regional dip of the Transvaal Supergroup rocks in the study region is towards the south (Fig. 6). However, well-exposed medium-bedded Malmani dolomites at the cave entrance show a moderately steep local dip to the northeast (Fig. 13). The south-facing entrance is littered with large, angular blocks of dolomite, some of which show well-developed elephant-skin weathering suggesting protracted exposure to the elements. The coarse rubble of fallen blocks with interstitial soil and hillwash continues down into a large main or entrance chamber, descending gently to the NE. The long axis of the chamber probably extends more-or-less NW-SE, parallel to the regional strike of the bedrocks (This orientation is assumed for the purposes of the present description). The main chamber of the cave is still largely open, with only a relatively limited sheet or cone of coarse blocky debris extending into it from the short but fairly wide side entrance (Fig. 14). The cave therefore does not appear to have been open to the exterior over a very long time interval in contrast with, for example, the cave systems in the Makapansgat Valley and at Swartkrans. Above a steeply sloping pile of large fallen blocks (collapse breccia) at the NW end of the main chamber there is a higher-lying subchamber that hosts a sizeable colony of bats and is floored with a soft carpet of bat guano. One or more small, open shafts that might possibly lead to lower-lying chambers are present in the NW part of the main cave' (Almond 2014).

According to enthnographic accounts, Gatkop cave serves as a methaporical link in Kgatla creation myths, possesses healing properties; serves as a medium through which offerings and appraisels can be brought to a supreme being (*Modimo*) and ancestral spirits (*badimo*) and even demi-gods. Gatkop cave also figures prominently in a creation myth which states that all Kgatla tribes emerged from this cave. 'The Kgatla of Kgafela has always been familiar with the mountainous region where Madimatla is located' (Van Vuuren 2014). Tshekane, the last settlement this group occupied in the Rooiberg area (AD1650) before they departed for the Pilanesberg prooved to be a very unhealthy abode (Breutz 1953). Neighbouring tribe members

who used to visit the cave were the Hlalerwa from Bobididi and the Masilo of Mabalingwe (Van Vuuren 2014).

Figure 29- Artefacts of archaeological significance observed in the thick and extensive deposit leading to the entrance of Gatkop cave include undecorated potsherds (to the right); an ostrich eggshell bead (center); a MST tool such as an *outill ecail* (center) and modern rubbish including pieces of glass bottles and plastic caps (top left).

Gatkop Cave is also an archaeological site with considerable remains intact which may reflect a time-depth which may reach back from the present into the Iron Age and possibly into Stone Age times as well. This is noteable from Iron Age artefacts observed near the entrance of the cave as well as the presence of cupules on rock surfaces and even ostrich eggshell beads and fragments although the latter artefacts may also have an affilitation with Iron Age people.

The wooden structures which Hall (1981) observed inside the chamber in the cave some thirty five years ago '... have since been considerably degraded...' (Almond 2014) and most probably have been used as firewood by traditional healers and their

‘patients’ who venture deep into the caves where fires are lit to conduct ceremonies and rituals and where these parties also overnight.

Figure 30- Cupules on the surface of a dolemite rock filled with money (offering goods) and candle wax near the entrance to Gatkop cave (above).

Geologically, the dolomitic cave system holds funnels and ventilation openings (chimneys) which link the underground system (and acestral world) with the surface. According to spokespersons the physical presence and position of this ventilation system is well known to the traditional healers.

Next to Gatkop cave’s use as traditional healing centre, the cave serves as habitat to a number of bats species. The cave and its bat populations therefore are the subject of research programs by scientist since the 1960’s when various bat monitoring and study programs were launched. The cave proved to be an important roost and maternity site for specific species of bat and currently is an important source for studying migratory patterns for bats. In order to conduct their studies, the scientists have to venture into the caves to do observations and to install monitoring equipment (Seamore 2014 and personal communication).

Figure 31- The entrance to Gatkop cave is covered with and extensive archaeological deposit which is noteable from the curvature of the earth's surface when looking towards the cave's mouth (above).

Figure 32- The second cave opening north-east of Gatkop cave leads into a vertical drop of several meters and do not have the same ideological significance as Gatkop cave (above).

Figure 33- A core consisting of chert from which flakes were struck, It occured on the plateau near the entrance to the second cave opening. A stone wallled site and other stone structures of limited extent were also on the plateau (above).

The second cave opening in a seperate dolomitic underground system is located on top of a flat hill (Gatkop hill) approximately 600m from Gatkop cave. Site LIA03, LIA04 and LIA05 which comprise half circular walls (half-enclosures), stone heaps and a short wall occur on the plateau near the second this cave opening.

A core from chert which may date from the Stone Age was observed near the cave's opening. It seems as if some flakes were struck from the core. It is possible that some archaeological material may be found on the flat surface between the cave's opening and Sites LIA03, LIA04 and LIA05. This, however, may not be substantial or of high significance.

The deep vertical drop into the second cave and its high carbon monoxide content may have been some of the most important deterrants which caused that this phenomenon was not utilized by humans in the past.

8.2.3 A graveyard

One informal graveyard (GY01) was recorded in the project area. GY01 comprises at least thirteen graves which are all covered with heaps of stones. Two of the graves are fittted with cement heastones.

All the graves which belong to farm workers and are probably older than sixty years.

Figure 34- Graveyard 01 in the project area holds approximately thirteen graves which are covered with heaps of stone (above).

8.2.3.1 A second possible graveyard

A second possible graveyard (GY02) with two graves may exist in the project area. According to Mr. Jan Coetzer (owner of Portion 10 of Donkerpoort 448 KQ) two graves used to occur on Randstephne 455KQ in a an area south of the proposed mine infrastructure (Figure 13). The two graves, however, have been covered in the past in order to prevent visitors from visiting the graveyard. Possible GY02 is no longer visible on the surface of the land and was also not detected during the field survey.

Possible graveyard 02 (GY02) is not further discussed in the report as this merely implies speculation about its existence. It is possible that GY02 occurs to the south of the planned mined infrastructure where it will not be affected by the current mine development plan.

Should possible GY02 be encountered in the future the same mitigation measures as those outlined for GY01 must be applied for this possible graveyard.

8.2.4 A historical house

At least one historical residence on Randstephne 455KQ occurs in the project area. It contains classical 'South African Edwardian' features in the flanked front veranda where both flanking rooms support Cape Dutch Gables. This building was constructed in the 1920's and is only one of few which were originally built in the region and which still survives. Similar houses are mostly lost and do not exist today as a result of 'upgrading and modernization' (Miller 2014). HH01 is still in a good state of repair although it is abandoned.

Figure 35- Front view of 1920 Cape Dutch residence on Ranstephne 455KQ. Note the flanked Cape Dutch styled gables (above).

Figure 36- Back view of historical residence on Randstephne 455KQ (above).

8.2.5 Tables

The coordinates and levels of significance for the heritage resources which were recorded in the project area are as follow:

Table 1 - Coordinates and significance rating for mines (below).

MINING SITES		
	Coordinates	**Significance**
Site 01 (**MS01**)	24° 34.950's 27° 39.540'e	**Medium to High**
Site 02 (**MS02**)	24º 34.8484607's 27º 39.7807282'e	**Medium to High**
Site 03 (**MS03**)	24º 34.8561381's 27º 39.7796301'e	**Medium to High**
Site 04 (**MS04**) Mine (pothole/quarry)	24° 35.455's 27° 39.764'e	**Medium to High**

Shelter (*lekuba*)	24° 35.452's 27° 39.764'e	
Short stubby wall	24° 35.452's 27° 39.779'e	
Circular structure	24° 35.468's 27° 39.776'e	

Table 2 - Coordinates and significance rating for stone wallled sites (below).

STONE WALLED SITES		
	Coordinates	**Significance**
LIA1.1 (Enclosure)	24° 35.028's 27° 40.062'e	**Medium to High**
LIA1.2 (Enclosure)	24° 35.052's 27° 40.059'e	**Medium to High**
LIA1.3 (Enclosure)	24° 35.074's 27° 40.066'e	**Medium to High**
LIA2.1 (Enclosure)	24° 36.863's 27° 39.009'e	**Medium to High**
LIA2.2 (Stone heap)	24° 36.868's 27° 39.002'e	**Medium to High**
LIA3.1 (Half enclosure)	24° 36.946's 27° 39.422'e	**Medium to High**
LIA3.2 (Stone heap)	24° 36.938's 27° 39.457'e	**Medium to High**
LIA3.3 (Stone heap)	Not geo-referenced	**Medium to High**
LIA4.1 (Two circular walls)	24° 35.808's 27° 39.353'e	**Medium to High**
LIA4.2 (Possible stone features)	Not geo-referenced	**Medium to High**
LIA5 (Short wall)	24° 35.793's 27° 39.411'e	**Medium to High**
LIA6 (Unidentifiable stone structures damaged)	24° 35.572's 27° 40.127'e	**Low**
LIA7 (Unidentifiable stone structures damaged)	24° 35.567's 27° 40.093'e	**Low**
LIA8.1 (Enclosure) **LIA8.2** (Enclosure) **LIA8.3** (Small enclosure)	24° 35.590's 27° 40.088'e	**Medium to High**
LIA9.1 (Enclosure)	24° 35.574's 27° 40.006'e	**Medium to High**
LIA9.2 (Enclosure)	Not geo-referenced	**Medium to High**
LIA9.3 (Half enclosure)	Not geo-referenced	**Medium to High**
LIA9.4 (Small enclosure)	Not geo-referenced	**Medium to High**
LIA10 (First small circular structure furnace?)	24° 35.555's 27° 39.994'e	**Medium to High**
LIA10 (Second small circular	Not geo-referenced	**Medium to High**

structure furnace?)		
LIA11.1 (Large enclosure) **LIA11.2** (small enclosure)	24° 35.521's 27° 39.946'e Not geo-referenced	**Medium to High** **Medium to High**
LIA12 (Half circle)	24° 35.525's 27° 39.921'e	**Medium to High**
LIA13.1 (Furnace) **LIA13.2** (Main entrance?) **LIA13.3** (Massive wall) **LIA13.4** (Large enclosure)	24° 35.212's 27° 40.813'e 24° 35.210's 27° 40.734'e 24° 35.239's 27° 39.735'e 24° 35.246's 27° 39.725'e	**Medium to High** **Medium to High** **Medium to High** **Medium to High**
LIA14 (Small enclosure)	24° 36.072's 27° 38.744'e	**Medium**
LIA15 (Small enclosure)	24° 36.256's 27° 38.618'e	**Medium**
LIA16 (Stone pile)	24° 36.105's 27° 38.867'e	**Medium**
LIA17 (Stone wall/line)	24° 36.399's 27° 38.621'e	**Medium**
LIA18 (destroyed)	24° 36.356's 27° 38.603'e	**Low**

Table 3 - Coordinates and significance rating for Madimatla (below).

CAVES		
	Coordinates	**Significance**
Gatkop Cave (**C1**)	24º 37' 05.2"s 27º 39' 08.4"	**HIGH**
SIGNIFICANCE CRITERIA		
Archaeological significance		**HIGH**
Ritual and religion (living heritage, sensitive landscape)		**HIGH**
Scientific		**HIGH**
Paleontological		**Low**
Second Cave 02 (**C2**)	24° 36.953's 27° 39.499'e	
SIGNIFICANCE CRITERIA		
Scientific		**HIGH**

Table 4 - Coordinates and significance rating for settlements without stone walls (below)

SETTLEMENTS WITHOUT STONE WALLS

IA01 (Smelting debris)	24° 35.916's 27° 40.568'e	**Medium to High**
IA2.2 (Possible furnace)	24° 35.769's 27° 39.103'e	**Medium to High**
IA2.3 (Possible furnace)	24° 35.746's 27° 39.103'e	**Medium to High**
IA3.1 (Stone heap)		**Medium to High**
IA3.2 (Stone heap)	24° 35.302's 27° 40.474'e	**Medium to High**
IA3.3 (Stone heap)	24° 35.343's 27° 40.487'e	**Medium to High**
	24° 35.339's 27° 40.505'e	**Medium to High**

Table 5 - Coordinates and significance rating for historical house (below).

HISTORICAL HOUSE		
	Coordinates	**Significance**
HH01	24° 35.854's 27° 40.300'e	**HIGH**

Table 6 - Coordinates and significance rating for graveyard (below).

GRAVEYARDS		
	Coordinates	**Significance**
GY01	24° 35.894's 27° 40.603'e	**HIGH**
Possible GY02	An area to the south of mine infrastructure (Figure 13)	**HIGH (if it exists)**

9 THE SIGNIFICANCE, POSSIBLE IMPACT ON AND MITIGATION OF THE HERITAGE RESOURCES

9.1 The significance of the heritage resources

The Meletse Iron Ore project will impact on some of the heritage resources. The significance of the heritage resources therefore has to be determined as well as the significance of any impact on the heritage resources. Mitigation measures are proposed for those heritage resources which may be affected by the Meletse Iron Ore project whilst management measures are outlined to ensure that those heritage resources which will not be impacted by the Meletse Iron Ore project will remain unaffected in the project area.

The significance of the heritage resources and the significance of the impact on the heritage resources was determined according to the types and ranges (categories) of heritage resources which were identified in order to ensure that all heritage resources in each category receive identical mitigation measures as well as the required management measures should they not be affected by the Meletse Iron Ore project remain unaffected in the project area.

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: 5 – Definite/don't know 4 – Highly probable 3 – Medium probability 2 – Low probability 1 – Improbable 0 – None	Duration: 5 – Permanent 4 – Long-term (ceases with the operational life) 3 - Medium-term (5-15 years) 2 - Short-term (0-5 years) 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 environmental 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 environmental significance.
- Between 60 and 80 significance points indicates HIGH environmental significance.
- Between 40 and 60 significance points indicates MODERATE environmental significance.
- Between 20 and 40 significance points indicates LOW environmental significance.

- Less than 20 significance points indicates VERY LOW environmental significance.

9.1.1 The significance of the prehistorical and historical remains

This category of heritage resources include evidence for mining activities, stone walled settlements and settlements without stone walls (Tables 1 to 6). These prehistorical and historical remains comprise archaeological settlements which are older than sixty years which are protected by the National Heritage Resources Act (No 25 of 1999).

The significance of the mines, stone walled settlements and settlements without stone walls can be rated as medium to high when considering criteria such as the following (Tables 1-3):

- These remains can contribute to a better understanding of the lifeways of Iron Age communities in the Rooiberg-Thabazimbi area which up to the present has been understudied.
- These settlements may contribute to a better understanding of mining and metal working during the Iron Age in this metal-rich region.

9.1.2 The significance of Gatkop (Madimatla) cave

Gatkop cave, also known as Madimatla, is situated outside the Meletse Iron Ore Project mining area. It is part of an underground dolomitic cave system that has significance on various levels such as archaeological, ritual and religion (living heritage) and scientific. However, Gatkop cave's paleontological significance is low (Table 3).

This geological phenomenon has archaeological significance due to the presence of an extensive archaeological deposit at the cave's entrance as well as the possible presence of archaeological pockets of material, artefacts and other possible remains (e.g. coprolites) inside the extensive network of caves, tunnels and caverns.

These archaeological deposits, artefacts and other remains may provide importance evidence with regard to the chronology of human-use of the cave system; the function,

meaning and ideological significance of the cave and its role within the southern Waterberg heritage landscape and even perhaps beyond its boundaries.

The archaeological significance of Gatkop cave therefore can be rated as high (Table 3).

Gatkop cave serves as a settlement with living heritage value and with tangible, intangible and immoveable attributes. The site is also part of a sensitive cultural landscape. Gatkop cave has a long pre-historical and historical chronology of use and managed to maintain its importance in the ritual and religious world of some communities. The cave is central to the cosmological world of the Kgatla and neighbouring communities and is also used by African traditional churches

Gatkop cave as an immoveable, intangible living heritage site therefore have high significance (Table 3).

The paleontological report compiled for the proposed Meletse Iron ore Project concluded that the Meletse Iron Ore project area is of low palaeontological sensitivity. This includes the footprint area for the proposed mining activities as well as the Gatkop cave and surroundings. No occurrences of bone-bearing breccia were identified at Gatkop cave which is situated approximately four kilometres SSW of the main iron ore mining area and over 600m lower in elevation. Any unrecorded palaeontological heritage resources here are therefore unlikely to be directly or indirectly affected by prospecting or any subsequent mining activity. No special measures therefore are required to protect any fossil heritage at Gatkop cave (Almond 2012, 2014).

Gatkop cave and the second cave in the dolomitic substructures on Randstephne 455KQ (located on top of a flat hill (Gatkop hill) approximately 600m from Gatkop cave) are also important to the natural scientific community who conduct multi-disciplinary research projects such as bat, zoological and paleo-climatic studies in and around the caves.

Gatkop cave, as a geological and scientific phenomenon therefore, has high significance (Table 3).

Gatkop cave can be rated as of high significance considering the following criteria derived from Section 3 of the National Heritage Resources Act (No 25 of 1999), namely (see Box 1):

(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;

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 …'. Those criteria that are applicable to Gatkop cave are the following:

(c) its importance in the community, or pattern of South Africa's history;
(d) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
(c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
(d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
(f) Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
(g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
(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;

9.1.3 The significance of the graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 5). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (Act No 25 of 1999) in instances where graves are older than sixty years. The appearance of the graves (stone piles with limited indecipherable cement headstones) suggest GY01 may be older than sixty years. 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 Human Tissues Act (No 65 of 1983 as amended).

9.1.4 The significance of the historical house

The historical house is older than sixty years and therefore qualify as historical remains. All remains older than sixty years are protected by the National Heritage Resources Act (No 25 of 1999).

The significance of the historical house can be described as medium to high when considering criteria such as the following (Table 6):

- Residences constructed in a Cape-Dutch architectural style in the Rooiberg-Thabazimbi area and therefore in the northern part of the country are a rarity.
- Very few historical residences still exist in the Rooiberg-Thabazimbi bushveld.
- The historical residence can be renovated and used by the mine for offices.

9.2 Possible impact on the heritage resources

According to the mine layout plan and the spatial distribution of the heritage resources in the project area it seems as if the following heritage resources may be directed (physically) and indirectly (non-physical) affected by the Meletse Iron Ore project.

9.2.1 Impacts on the prehistorical and historical remains

The following prehistorical and historical remains will be directly affected by the Meletse Iron Ore project, namely:

- All the mines (MS01, MS02 and MS03) will be affected by the proposed open cast pit and by the proposed haul road (MS04).
- Some of the Late Iron stone walled sites will be affected by the proposed waste rock dump (LIA01) and by the proposed haul road (LIA04, LIA05).

The level of significance of the impacts will be very high (Table 7).

Table 7- The significance of potential impacts on the mines, stone wallled settlements and the settlements without stone walls (below).

	Probability of impact	Magnitude of impact	Duration of impact	Scale	Significance points	Significance rating	Significance after mitigation
MS01	**5**	**10**	**5**	**1**	**90**	**Very High**	**Medium**
MS02	**5**	**10**	**5**	**1**	**90**	**Very High**	**Medium**
MS03	**5**	**10**	**5**	**1**	**90**	**Very High**	**Medium**
MS04	**5**	**10**	**5**	**1**	**90**	**Very High**	**Medium**
LIA01	**5**	**10**	**5**	**1**	**90**	**Very High**	**Medium**
LIA04	**5**	**10**	**5**	**1**	**90**	**Very High**	**Medium**
LIA05	**5**	**10**	**5**	**1**	**90**	**Very High**	**Medium**

9.2.2 Impacts on Gatkop (Madimatla) cave

The spiritual and cultural significance of Gatkop cave are confined to this underground cave system and are not associated with Meletse Mountain. The mountain, or any of its features such as its peak, therefore holds no cultural, spiritual or any religious significance on its own. It is rather the undertaking of any activities with a high impact (such as mining) in the area surrounding the cave which could pose a potential threat to the religious and cultural values which are experienced at the cave (Van Vuuren 2014b).

It therefore appears that references to ‘Madimatla’ as experienced, by traditional healers are confined to the Gatkop cave and its associated underground cave

system. This dolomitic substructure is documented and this clearly defines its extent which is to the south-west of the proposed Meletse Iron Ore Project. This location is outside the mine's proposed footprint where it need not be directly (physically) impacted by the current mine development plan.

The significance of some mining impacts on Gatkop cave's tangible heritage therefore is low (Table 8).

Current direct impacts are experienced at Gatkop cave. This ritual and religious site are frequented by unregulated visitor groups who move across a sensitive archaeological deposit which is situated at the cave's entrance. The nature of certain activities and ceremonies conducted at the site, e.g. the erection of the traditional healers's preperation enclosure occurred in this deposit. A notice board and ablution facilities respectively were placed on top of the archaeological deposit and in close proximity of the cave's entrance. Ceremonies and rituals are conducted deep into the cave system where pockets of undisturbed archaeological material or other evidence (e.g. corprolites) of past human behaviour may occur. Studies which are conducted by natural scientist at Gatkop cave and its associated underground system may have related direct harmfull affects on the cave.

The significance of current direct impacts on Gatkop cave's tangible heritage therefore is medium to high (Table 8).

Gatkop cave is part of a sensitive cultural landscape considering it's local setting and regional context within the southern Waterberg. Influences from mining activities such as the transformation of the landscape; blasting and concomittant higher noise levels; dust pollution; population and traffic increase, etc. will undoubfully have an influence on the intangible heritage attributes of the site such as its religious and cultural historical value.

The significance of some indirect mining impacts on Gatkop cave's intangible heritage therefore is medium to low (Table 8).

Table 8- The significance of potential direct and indirect impacts on Gatkop cave (below).

Impact	Probability of impact	Magnitude of impact	Duration of impact	Scale	Significance points	Significance rating	Significance after mitigation
Direct mining	**1**	**4**	**5**	**1**	**10**	**Low**	**Low**
Direct Healers Scientist	**5** **5**	**8** **6**	**5** **5**	**1** **1**	**70** **60**	**High** **High**	**Medium- Low**
Indirect mining	**5**	**8**	**5**	**1**	**70**	**High**	**Medium- Low**

9.2.3 Impacts on the graveyard

The proposed mine foot print will not impact on the graveyard which is located to the south of the mine footprint and proposed haul roads.

The significance of any possible impact on the graveyard therefore is low. This also applies when a graveyard management program is implemented (Table 9).

Possible GY02 occurs to the south of the planned mined infrastructure where it will not be affected by the current mine development plan.

Table 9- The significance of potential impacts on the graveyard (below).

	Probability of impact	Magnitude of impact	Duration of impact	Scale	Significance points	Significance rating	Significance after managment program
GY01	**1**	**2**	**5**	**1**	**11**	**Low**	**Low**
Possible GY02	**1**	**2**	**5**	**1**	**11**	**Low**	**Low**

9.2.4 Impacts on the historical house

The proposed mine foot print will not imact on the historical house which is located to the north of mine infrastructure.

The significance of any possible impact on the historical house therefore is low. This also applies when the house is renovated and re-used. (Table 10).

Table 10- The significance of potential impacts on the historical house (below).

	Probability of impact	**Magnitude of impact**	**Duration of impact**	**Scale**	**Significance points**	**Significance rating**	**Significance after renovation and reuse**
GY01	**1**	**2**	**5**	**1**	**11**	**Low**	**Low**

9.3 Mitigating and managing the heritage resources

The following mitigation and management measures are outlined for those heritage resources which will be affected by the Meletse Iron Ore project, namely:

9.3.1 Mitigating the impacts on the prehistorical and historical remains

The mines and stone walled settlements must be investigated by means of a Phase 2 investigation. An archaeologist registered with the Association for Southern African Professional Archaeologists (ASAPA) must obtain a permit from the SAHRA in order to conduct the necessary investigations. After the Phase 2 investigation has been completed the SAHRA may issue a permit for the demolishing of the mines and Late Iron Age stone walled sites.

The significance of the impact on the prehistorical and historical remains will be low after mitigation (Table 7).

9.3.2 Mitigating the impacts on Gatkop (Madimatla) cave

From the significance of possible direct and indirect impacts on Gatkop cave it is clear that mitigation and management measures have to be laid down for the cave and its immediate surroundings. Gatkop cave must be declared a provincial heritage site as was recommended in the anthropologist reports (Van Vuuren 2014a, b). This will benefit all stakeholders. Documents, papers and acts are listed by the anthropologist to support the significance of Gatkop cave as a sensitive cultural resource falling into the immovable and intangible heritage domain. The process to follow in order to declare Gatkop cave a provincial heritage site is also outlined by the anthropologist.

The Meletse Iron Ore project area is of low palaeontological sensitivity. Potential mitigation measures which may be considered for any paleontological resources are dependent on the discovery of potentially substantial new fossil remains during the mine development program. Therefore, no further specialist palaeontological studies or mitigation measures for the Meletse Iron Ore Project are considered necessary.

- The ECO responsible for the mining and road developments should be aware of the possibility of important fossils being present or unearthed on site and should monitor all substantial excavations into fresh (*i.e.* unweathered) sedimentary bedrock for fossil remains;
- In the case of any significant fossil finds (*e.g.* vertebrate teeth, bones, stromatolites) during construction, these should be safeguarded - preferably *in situ* - and reported by the ECO as soon as possible to the relevant heritage management authority (South African Heritage Resources Agency. Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that any appropriate mitigation by a palaeontological specialist can be considered and implemented, at the developer's expense;

The palaeontologist concerned with mitigation work will need a valid collection permit from SAHRA. All work would have to conform to international best practice for

palaeontological fieldwork and the study (*e.g.* data recording fossil collection and curation, final report) should adhere to the minimum standards for Phase 2 palaeontological studies recently published by SAHRA (2013) (Almond 2012, 2014).

It is not the aim of this Phase I detailed HIA study to outline a management plan for Gatkop cave as this would require interaction between various stakeholders which amongst others would involve the SAHRA, traditional healers, scientists who have an interest in the cave and Aquila. However, a few guidelines previously outlined are elaborated upon whilst some recommendations towards the archaeological conservation of the site are emphasised, namely:

- The demarcation of Gatkop cave and its surroundings is important. It is said that traditional healers are well acquainted with original access footpaths to the cave as well as the natural air ventilations (chimneys) and other concealed entrances to the cave. This will coincide with the mapped underground dolomitic substructure in which the cave is situated and could possibly serve as a guideline to establish the perimeter of the proposed provincial heritage site.
- Access control and security to Gatkop cave is a major concern considering the involvement of different interest groups, traditional healers, scientists, archaeologists, interested groups such as tourists (especially after declaration of the site), etc. and possible vandalism as soon as Gatkop cave is declared a provincial heritage site. Other problems currently experienced with uncontrolled access are littering of the site; the arrival of busloads of visitors for ritual or religious matters at the site without accommodation, etc.
- The random construction of traditional structures on site as recommended by traditional healers should consider the archaeological and heritage sensitivity of the site as current facilities on site such as the ablution, notice board, preparation enclosure for the traditional healers and perimeter fence have not considered these sensitivities when constructed.
- Traditional infrastructure on site may take the form of a small open air museum display which illuminates the role and significance of Gatkop cave and the traditional healer. However, this should occur at a locality where it will not influence the archaeological remains. A display of this nature must be of a

high standard and must be maintained in order not to reflect positively on the integrity of the provincial heritage site.

- The scientific importance of Gatkop cave and its extensive underground cave system suggest cooperation between archaeologists and other scientist which are not only limited to the conservation and sustainable use and study of this natural and cultural phenomenon. The exchange of knowledge will also enrich each other's field of specialisation.
- The different ways in which the cave system are studied by scientists and traditional healers warrant an investigation into each other's fields of specialisation considering the methodologies and practises which are applied and which may not contribute to the protection and conservation of this multi-varied and complicated settlement.
- Potential health hazards posed by the caves must be given high consideration during the compilation of a heritage management plan.

Different stakeholders therefore have an interest in Gatkop cave. These interests do not necessarily concur or support each of the others motives and agendas with the site. Although the site occurs outside the boundaries of the mining area where it needs not to be directly affected by mining activities, Aquila is the proprietor of the land on which the site is located. As a potential future role player in the region the mine has to partake with other role players in the development of a management program for the site. Aquila's social responsibilities may serve as a catalyst to provide resources towards the conservation and management of the site according to professional standards and best practises applicable to all involved with the sustainable use of the site.

The significance of any direct impact on Gatkop cave is low and after a management program has been put in place for indirect impacts the significance of indirect impacts on the cave will be medium to low (Table 8).

9.3.3 Mitigating the impact on the graveyard

The graveyard can be mitigated by means of exhumation and relocation. The exhumation of human remains and the relocation of graveyards are regulated by

various laws, regulations and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 days statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains have to be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local police.

However, the graveyard needs not to be affected by the Meletse Iron Ore project. Consequently, the following management measures are proposed for the continued unaffected existence of the graveyard during the construction, operation and eventual closure of the Meletse Iron Ore project, namely:

- The graveyards must be demarcated with a fence or with a wall and should be fitted with an access gate.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This will not be necessary if the graveyard can directly be linked with a road leading from the nearby Alma road.
- Corridors of at least 20m should be maintained between the graveyard's fence and any developmental components such as roads or other mine infrastructure that may be developed in the future.
- The graveyard must be inspected every three months. Inspections must be noted in an inspection register. The register must outline the state of the graveyard during each inspection. Reports on damages to any of the graves or to the graveyards' (fence, wall, gate) must be followed with the necessary maintenance work. Maintenance work must be recorded in in the inspection register.
- The graveyards must be kept tidy from any invader weeds and any other refuse.

The significance of any possible impact on the graveyard after a management program has been put in place will be low (Table 9).

Should possible GY02 be encountered in the future the same mitigation measures as those outlined for GY01 must be applied for this possible graveyard.

9.3.4 Mitigating the impact on the historical house

The historical house may not be affected by the Meletse Iron Ore project or may not be renovated *prior* to the investigation of the residence by a historical architect in good standing with the SAHRA. Aquila or the historical architect has to acquire a demolition permit or a permit for the renovation of the structure from the SAHRA after the historical residence has been documented by the historical architect. Only hereafter may the historical residence be altered (demolished, renovated) as a result of the Meletse Iron Ore project.

The significance of any possible impact on the historical house after renovation and re-use will be low (Table 10).

10 CONCLUSION AND RECOMMENDATIONS

The Phase I detailed HIA study for the proposed Meletse Iron Ore project revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in and near the Project Area, namely:

- Prehistorical and historical remains consisting of mining sites and stone walled settlements, some with evidence for metal working.
- Madimatla Cave in a dolomitic underground cave system which is an archaeological site with living heritage significance and which is currently being used by traditional healers.
- An early twentieth century Cape Dutch styled residence.
- An informal graveyard and a possible second graveyard.
- To (apart from the above) describe, explain and contextualize the significance of the landscape qualities and intangible heritage of the area.

All the heritage resources were geo-referenced and mapped (Figure 13; Tables 1-6).

The significance of the heritage resources

The Meletse Iron Ore project will impact on some of the heritage resources. The significance of the heritage resources therefore have to be determined as well as the significance of any impact on the heritage resources. Mitigation measures are proposed for those heritage resources which may be affected by the Meletse Iron Ore project whilst management measures are outlined to ensure that those heritage resources which will not be impacted by the Meletse Iron Ore project will remain unaffected in the project area.

The significance of the heritage resources and the significance of the impact on the heritage resources was determined according to the types and ranges (categories) of heritage resources which were identified in order to ensure that all heritage resources in each category receive identical mitigation measures as well as the required

management measures should they be affected by the Meletse Iron Ore project or whether they remain unaffected in the project area.

The significance of possible impacts on the heritage resources was determined using a ranking scale based on various criteria.

The significance of the prehistorical and historical remains

This category of heritage resources include evidence for mining activities, stone walled settlements and settlements without stone walls (Tables 1 to 6). These prehistorical and historical remains comprise archaeological settlements which are older than sixty years which are protected by the National Heritage Resources Act (No 25 of 1999).

The significance of the mines, stone walled settlements and settlements without stone walls can be rated as medium to high when considering criteria such as the following (Tables 1-3):

- These remains can contribute to a better understanding of the lifeways of Iron Age communities in the Rooiberg-Thabazimbi area which up to the present has been understudied.
- These settlements may contribute to a better understanding of mining and metal working during the Iron Age in this metal-rich region.

The significance of Gatkop cave

Gatkop cave, also known as Madimatla, is situated outside the Meletse Iron Ore Project mining area. It is part of an underground dolomitic cave system that has significance on various levels such as archaeological, ritual and religion (living heritage) and scientific. However, Gatkop cave's paleontological significance is low (Table 3).

This geological phenomenon has archaeological significance due to the presence of an extensive archaeological deposit at the cave's entrance as well as the possible presence of archaeological pockets of material, artefacts and other possible remains (e.g. coprolites) inside the extensive network of caves, tunnels and caverns.

These archaeological deposits, artefacts and other remains may provide importance evidence with regard to the chronology of human-use of the cave system; the function, meaning and ideological significance of the cave and its role within the southern Waterberg heritage landscape and even perhaps beyond its boundaries.

The archaeological significance of Gatkop cave therefore can be rated as high (Table 3).

Gatkop cave serves as a settlement with living heritage value and with tangible, intangible and immoveable attributes. The site is also part of a sensitive cultural landscape. Gatkop cave has a long pre-historical and historical chronology of use and managed to maintain its importance in the ritual and religious world of some communities. The cave is central to the cosmological world of the Kgatla and neighbouring communities and is also used by African traditional churches

Gatkop cave as an immoveable, intangible living heritage site therefore have high significance (Table 3).

The paleontological report compiled for the proposed Meletse Iron ore Project concluded that the Meletse Iron Ore project area is of low palaeontological sensitivity. This includes the footprint area for the proposed mining activities as well as the Gatkop cave and surroundings. No occurrences of bone-bearing breccia were identified at Gatkop cave which is situated approximately four kilometres SSW of the main iron ore mining area and over 600m lower in elevation. Any unrecorded palaeontological heritage resources here are therefore unlikely to be directly or indirectly affected by prospecting or any subsequent mining activity. No special measures therefore are required to protect any fossil heritage at Gatkop cave (Almond 2012, 2014).

Gatkop cave and the second cave in the dolomitic substructures on Randstephne 455KQ (located on top of a flat hill (Gatkop hill) approximately 600m from Gatkop cave) are also important to the natural scientific community who conduct multi-

disciplinary research projects such as bat, zoological and paleo-climatic studies in and around the caves.

Gatkop cave, as a geological and scientific phenomenon therefore, has high significance (Table 3).

Gatkop cave can be rated as of high significance considering the following criteria derived from Section 3 of the National Heritage Resources Act (No 25 of 1999), namely (see Box 1):

(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;
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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 …'. Those criteria that are applicable to Gatkop cave are the following:

(e) its importance in the community, or pattern of South Africa's history;
(f) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
(c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
(d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
(f) Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
(g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
(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;

The significance of the graveyard

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 5). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (Act No 25 of 1999) whenever graves are older than sixty years. The appearance of the graves (stone piles with limited indecipherable cement headstones) suggest GY01 may be older than sixty years. 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 Human Tissues Act (No 65 of 1983 as amended).

The graveyard therefore has high significance (Table 5).

The significance of the historical house

The historical house is older than sixty years and therefore qualify as historical remains. All remains older than sixty years are protected by the National Heritage Resources Act (No 25 of 1999).

The significance of the historical house can be described as medium to high when considering criteria such as the following (Table 6):

- Residences constructed in a Cape-Dutch architectural style in the Rooiberg-Thabazimbi area and therefore in the northern part of the country are a rarity.
- Very few historical residences still exist in the Rooiberg-Thabazimbi bushveld.
- The historical residence can be renovated and used by the mine for offices.

The historical residence therefore has medium to high significance (Table 6).

Possible impact on the heritage resources

According to the mine layout plan and the spatial distribution of the heritage resources in the project area it seems as if the following heritage resources may be directed (physically) and indirectly (non-physical) affected by the Meletse Iron Ore project.

Impacts on the prehistorical and historical remains

The following prehistorical and historical remains will be directly affected by the Meletse Iron Ore project, namely:

- All the mines (MS01, MS02 and MS03) will be affected by the proposed open cast pit and by the proposed haul road (MS04).
- Some of the Late Iron stone walled sites will be affected by the proposed waste rock dump (LIA01) and by the proposed haul road (LIA04, LIA05).

The level of significance of the impacts on the prehistorical and historical remains will be very high (Table 7).

Impacts on Gatkop cave

The spiritual and cultural significance of Gatkop cave are confined to this underground cave system and are not associated with Meletse Mountain. The mountain, or any of its features such as its peak, therefore holds no cultural, spiritual or any religious significance on its own. It is rather the undertaking of any activities with a high impact (such as mining) in the area surrounding the cave which could pose a potential threat to the religious and cultural values which are experienced at the cave (Van Vuuren 2014b).

It therefore appears that references to 'Madimatla' as experienced, by traditional healers are confined to the Gatkop cave and its associated underground cave system. This dolomitic substructure is documented and this clearly defines its extent which is to the south-west of the proposed Meletse Iron Ore Project. This location is outside the mine's proposed footprint where it need not be directly (physically) impacted by the current mine development plan.

The significance of some mining impacts on Gatkop cave's tangible heritage therefore is low (Table 8).

Current direct impacts are experienced at Gatkop cave. This ritual and religious site are frequented by unregulated visitor groups who move across a sensitive archaeological deposit which is situated at the cave's entrance. The nature of certain activities and ceremonies conducted at the site, e.g. the erection of the traditional healers's preperation enclosure occurred in this deposit. A notice board and ablution facilities respectively were placed on top of the archaeological deposit and in close proximity of the cave's entrance. Ceremonies and rituals are conducted deep into the cave system where pockets of undisturbed archaeological material or other evidence (e.g. corprolites) of past human behaviour may occur. Studies which are conducted by natural scientist at Gatkop cave and its associated underground system may have related direct harmfull affects on the cave.

The significance of current direct impacts on Gatkop cave's tangible heritage therefore is medium to low (Table 8).

Gatkop cave is part of a sensitive cultural landscape considering it's local setting and regional context within the southern Waterberg. Influences from mining activities such as the transformation of the landscape; blasting and concomittant higher noise levels; dust pollution; population and traffic increase, etc. will undoubfully have a direct influence on the intangible heritage attributes of the site such as its religious and cultural historical value.

The significance of some (indirect) mining impacts on Gatkop cave's intangible heritage therefore is medium to low (Table 8).

Impacts on the graveyard

The proposed mine footprint will not impact on the graveyard which is located to the south of the mine footprint and proposed haul roads.

The significance of any possible impact on the graveyard therfore is low. This also applies when a graveyard management program is implemented (Table 9).

Impacts on the historical house

The proposed mine footprint will not impact on the historical house which is located to the north of mine infrastructure.

The significance of any possible impact on the historical house therfore is low. This also applies when the house is renovated and re-used. (Table 10).

Mitigating and managing the heritage resources

The following mitigation and management measures are outlined for those heritage resources which will be affected by the Meletse Iron Ore project, namely:

Mitigating the impacts on the prehistorical and historical remains

The mines and stone walled settlements must be investigated by means of a Phase 2 investigation. An archaeologist registered with the Association for Southern African Professional Archaeologists (ASAPA) must obtain a permit from the SAHRA in order to conduct the necessary investigations. After the Phase 2 investigation has been completed the SAHRA may issue a permit for the demolishing of the mines and Late Iron Age stone walled sites.

The significance of the impact on the prehistorical and historical remains will be low after mitigation (Table 7).

Mitigating the impacts on Gatkop cave

From the significance of possible direct and indirect impacts on Gatkop cave it is clear that mitigation and management measures have to be laid down for the cave and its immediate surroundings. Gatkop cave must be declared a provincial heritage site as was recommended in the anthropologist reports (Van Vuuren 2014a, b). This will benefit all stakeholders. Documents, papers and acts are listed by the anthropologist to support the significance of Gatkop cave as a sensitive cultural resource falling into the immovable and intangible heritage domain. The process to

follow in order to declare Gatkop cave a provincial heritage site is also outlined by the anthropologist.

The Meletse Iron Ore project area is of low palaeontological sensitivity. Potential mitigation measures which may be considered for any paleontological resources are dependent on the discovery of potentially substantial new fossil remains during the mine development program. Therefore, no further specialist palaeontological studies or mitigation measures for the Meletse Iron Ore Project are considered necessary.

- The ECO responsible for the mining and road developments should be aware of the possibility of important fossils being present or unearthed on site and should monitor all substantial excavations into fresh (*i.e.* unweathered) sedimentary bedrock for fossil remains;
- In the case of any significant fossil finds (*e.g.* vertebrate teeth, bones, stromatolites) during construction, these should be safeguarded - preferably *in situ* - and reported by the ECO as soon as possible to the relevant heritage management authority (South African Heritage Resources Agency. Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that any appropriate mitigation by a palaeontological specialist can be considered and implemented, at the developer's expense;

The palaeontologist concerned with mitigation work will need a valid collection permit from SAHRA. All work would have to conform to international best practice for palaeontological fieldwork and the study (*e.g.* data recording fossil collection and curation, final report) should adhere to the minimum standards for Phase 2 palaeontological studies recently published by SAHRA (2013) (Almond 2012, 2014).

It is not the aim of this Phase I detailed HIA study to outline a management plan for Gatkop cave as this would require interaction between various stakeholders which amongst others would involve the SAHRA, traditional healers, scientists who have an interest in the cave and Aquila. However, a few guidelines previously outlined are

elaborated upon whilst some recommendations towards the archaeological conservation of the site are emphasised, namely:

- The demarcation of Gatkop cave and its surroundings is important. It is said that traditional healers are well acquainted with original access footpaths to the cave as well as the natural air ventilations (chimneys) and other concealed entrances to the cave. This will coincide with the mapped underground dolomitic substructure in which the cave is situated and could possibly serve as a guideline to establish the perimeter of the proposed provincial heritage site.
- Access control and security to Gatkop cave is a major concern considering the involvement of different interest groups, traditional healers, scientists, archaeologists, interested groups such as tourists (especially after declaration of the site), etc. and possible vandalism as soon as Gatkop cave is declared a provincial heritage site. Other problems currently experienced with uncontrolled access are littering of the site; the arrival of busloads of visitors for ritual or religious matters at the site without accommodation, etc.
- The random construction of traditional structures on site as recommended by traditional healers should consider the archaeological and heritage sensitivity of the site as current facilities on site such as the ablution, notice board, preparation enclosure for the traditional healers and perimeter fence have not considered these sensitivities when constructed.
- Traditional infrastructure on site may take the form of a small open air museum display which illuminates the role and significance of Gatkop cave and the traditional healer. However, this should occur at a locality where it will not influence the archaeological remains. A display of this nature must be of a high standard and must be maintained in order not to reflect positively on the integrity of the provincial heritage site.
- The scientific importance of Gatkpp cave and its extensive underground cave system suggest cooperation between archaeologists and other scientist which are not only limited to the conservation and sustainable use and study of this natural and cultural phenomenon. The exchange of knowledge will also enrich each other's field of specialisation.

- The different ways in which the cave system are studied by scientists and traditional healers warrant an investigation into each other's fields of specialisation considering the methodologies and practises which are applied and which may not contribute to the protection and conservation of this multi-varied and complicated settlement.
- Potential health hazards posed by the caves must be given high consideration during the compilation of a heritage management plan.

Different stakeholders therefore have an interest in Gatkop cave. These interests do not necessarily concur or support each of the others motives and agendas with the site. Although the site occurs outside the boundaries of the mining area where it needs not to be directly affected by mining activities, Aquila is the proprietor of the land on which the site is located. As a potential future role player in the region the mine has to partake with other role players in the development of a management program for the site. Aquila's social responsibilities may serve as a catalyst to provide resources towards the conservation and management of the site according to professional standards and best practises applicable to all involved with the sustainable use of the site.

The significance of any direct impact on Gatkop cave is low and after a management program has been put in place for indirect impacts the significance of indirect impacts on the cave will be medium to low (Table 8).

Mitigating the impact on the graveyard

The graveyard can be mitigated by means of exhumation and relocation. The exhumation of human remains and the relocation of graveyards are regulated by various laws, regulations and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 days statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains have to be obtained from the descendants of the deceased (if known), the National Department

of Health, the Provincial Department of Health, the Premier of the Province and the local police.

However, the graveyard needs not to be affected by the Meletse Iron Ore project. Consequently, the following management measures are proposed for the continued unaffected existence of the graveyard during the construction, operation and eventual closure of the Meletse Iron Ore project, namely:

- The graveyards must be demarcated with a fence or with a wall and should be fitted with an access gate.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This will not be necessary if the graveyard can directly be linked with a road leading from the nearby Alma road.
- Corridors of at least 20m should be maintained between the graveyard's fence and any developmental components such as roads or other mine infrastructure that may be developed in the future.
- The graveyard must be inspected every three months. Inspections must be noted in an inspection register. The register must outline the state of the graveyard during each inspection. Reports on damages to any of the graves or to the graveyards' (fence, wall, gate) must be followed with the necessary maintenance work. Maintenance work must be recorded in in the inspection register.
- The graveyards must be kept tidy from any invader weeds and any other refuse.

The significance of any possible impact on the graveyard after a management program has been put in place will be low (Table 9).

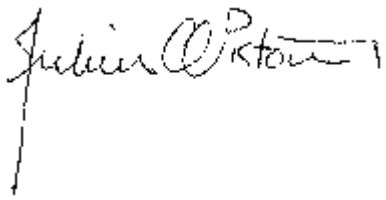
Should possible GY02 be encountered in the future the same mitigation measures as those outlined for GY01 must be applied for this possible graveyard.

Mitigating the impact on the historical house

The historical house may not be affected by the Meletse Iron Ore project or may not be renovated *prior* to the investigation of the residence by a historical architect in good

standing with the SAHRA. Aquila or the historical architect has to acquire a demolition permit or a permit for the renovation of the structure from the SAHRA after the historical residence has been documented by the historical architect. Only hereafter may the historical residence be altered (demolished, renovated) as a result of the Meletse Iron Ore project.

The significance of any possible impact on the historical house after renovation and re-use will be low (Table 10).



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