

# **FINAL Basic Assessment Report And Environmental Management Programme**

**For the Regulation 31 Amendment of Listed Activities associated with  
Mining Right**

**LP 30/5/1/2/3/2/1/10161 EM**

**Waterberg JV Resources (Pty) Ltd**

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## IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002 as amended), the Minister must grant a prospecting or mining right if, among others, the mining “*will not result in unacceptable pollution, ecological degradation or damage to the environment*”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme Report in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any Report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17(1)(c) the Competent Authority must check whether the application has taken into account any minimum requirements applicable, or instructions or guidance provided by the Competent Authority to the submission of applications.

**It is therefore an instruction that** the prescribed Reports required in respect of applications for an Environmental Authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

**It is furthermore an instruction that** the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the Report is not cluttered with uninterpreted information and that it unambiguously represents the interpretation of the applicant.



## OBJECTIVE OF THE SECTION 31 AMENDMENT PROCESS

The objective of the basic assessment process is to, through a consultative process-

- determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- identify the alternatives considered, including the activity, location, and technology alternatives;
- describe the need and desirability of the proposed alternatives;
- through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
  - the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - the degree to which these impacts—
    - can be reversed;
    - may cause irreplaceable loss of resources; and
    - can be managed, avoided or mitigated;
  - through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
    - identify and motivate a preferred site, activity and technology alternative;
    - identify suitable measures to manage, avoid or mitigate identified impacts; and
    - identify residual risks that need to be managed and monitored.

## EXECUTIVE SUMMARY

This application entails an amendment of the existing Mining Right and Integrated Environmental Authorisation (“**IEA**”) granted to Waterberg JV Resources (Pty) Ltd (“**Waterberg**”) to mine various minerals on the farms Disseldorp 369 LR, Goedetrouw 366 LR, Rosamond 357 LR, Lomonside 323 LR, Langbryde 324 LR, Old Langsine 360 LR, Millstream 358 LR, Ketting 368 LR and Early Dawn 361 LR, (“**the Mining Area**”) all of which are situated in the Blouberg Magisterial District of the Limpopo Province.

Waterberg is the holder of an approved Environmental Management Programme (“**EMPr**”) and Mining Right (Reference: LP 30/5/1/2/3/2/1/10161 EM), as well as Environmental Authorisation (reference number: LP 30/5/1/2/3/2/1/10161 EM) authorising the mining activities.

In order to maximise the present resources, Waterberg aims to further extend its Mining Right to include additional areas, namely the farms Bonne Esperance 356 LR and Too Late 359 LR (“**Extension Area**”).

The impacts associated with Waterberg’s mining activities in this area have previously been assessed and therefore the inclusion of the Extension Area would merely result in a change of scope which results in an increased extent of the impacts which was not assessed and included in the original applications as contemplated in Regulation 31 of NEMA.

To mine the Extension Area, Waterberg requires authorisation under the following primary legislations:

- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (“**NEMA**”) and the NEMA Environmental Impact Assessment (EIA) Regulations, 2014; and
- The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (“**MPRDA**”).

It is possible to amend the existing Mining Right to include additional areas if the Minister consents to such an amendment in terms of section 102 of the MPRDA. To amend the Environmental Authorisation, the Regulation 31 Amendment process is deemed relevant to include the Extension Area in the Mining Area.

The farms to be incorporated lie adjacent to the existing Waterberg Mining Area.

The Public Participation Process is conducted as required by Regulation 41 of the EIA Regulations and Section 24K of NEMA.

Waterberg has an existing and approved EMPr. It is proposed that this EMPr be applied to the Extension Area, as it contains all the necessary management and mitigation measures to ensure potential impacts of this mining method in this area are managed to acceptable levels of severity, especially since exploration and mining activities on the Extension Area will be conducted underground.

### **Conclusions and recommendations**

Based on the findings of the assessment, the proposed Extension Area does not present any fatal flaws in terms of negative impacts to the environment. Nonetheless, adequate mitigation measures have been proposed in the approved EMPr of the existing Mining Right to reduce the significance of the

identified negative impacts. Monitoring plans have also been provided to ensure that adverse impacts are recognised, and continuous improvements are developed and monitored throughout the lifespan of the Waterberg Project.

Based on the assessment of the impacts associated with the addition of the farms Bonne Esperance 356 LR and Too Late 359 LR, and that the intention is for any exploration and mining activities to be conducted underground, it is recommended that the proposed amendment of the Integrated Environmental Authorisation and EMPr should be authorised, provided that the mitigation measures proposed herein are applied diligently.

**PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT****1. Project Applicant**

This section of the BAR provides an overview of the applicant, details the Environmental Assessment Practitioner (“EAP”) who will oversee and facilitate the environmental process, and details the Competent Authorities.

**1.1 Details of the applicant**

Project applicant:	Waterberg JV Resources (Pty) Ltd		
Trading name (if any):	Waterberg JV Resources		
Contact person:	Mr Mlibo Mgudlwa		
Physical address:	1st Floor, Rosebank Terrace, 23-25 Sturdee Avenue Rosebank, Johannesburg 2196		
Postal address:	Postnet Suite 81, Private Bag X12, Roosevelt Park		
Postal code:	2196	Cell:	082 859 4453
Telephone:	+27 11 214 7800	Fax:	+27 11 447 1000
E-mail:	<a href="mailto:mmgudlwa@platinumgroupmetals.co.za">mmgudlwa@platinumgroupmetals.co.za</a>		

**Table 1: Details of applicant.****1.2 Details of the EAP**

Bateleur was appointed by Waterberg as the independent environmental consultant to facilitate the Environmental Authorisation application process for the proposed extension of the Waterberg Mining Area. Mrs Yonanda Martin acts as the independent EAP for the project.

Environmental Assessment Practitioner:	Mrs Yonanda Martin		
Contact person:	Gert Pretorius		
Postal address:	PO Box 70706, Die Wilgers		
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Telephone:	082 338 6607	Fax:	086 619 3120
E-mail:	<a href="mailto:gertenes@lantic.net">gertenes@lantic.net</a> ;		
Qualifications:	MSc (Env)		
Professional affiliations (if any):	SACNASP: 400204/2009 EAPASA: 2019/1307		

**Table 2: Details of the EAP.**

### 1.3 Location of activity

The Extension Area is located approximately 30 kilometers west of Senwabarwana in the Limpopo Province.

Farm Names:	Bonne Esperance 356 LR and Too Late 359 LR
Application Area (Ha):	4 488.51 ha
District Municipality:	Waterberg
Distance and direction from nearest town:	Senwabarwana – 30 km east.
21-digit Surveyor General Code for each farm portion:	T0LR00356000000000000 T0LR00359000000000000

**Table 3: Details of location.**



Figure 1: Locality map.

## **2. Description of the scope of the proposed overall activity**

Bonne Esperance 356 LR and Too Late 359 LR are to the west of the farms Langbryde 324 LR and Old Langsine 360 LR and to the north of the farms Rosamond 357 LR and Millstream 358 LR which form part of the Mining Right held by Waterberg.

Geologically, the known mineralized zone of the Bushveld Complex underlain by these two farms are downdip of the known sub-crop position on the farm Old Langsine at an approximate depth of 1 200m.

The farms are situated in the mountainous area of the Makgabeng Plato, and previous specialist environmental studies showed that the farms are included within a protected area. Because of these facts, surface exploration on the farms will not be possible.

It is the intention of Waterberg to execute an underground exploration programme once the underground development from the current Mining Area reaches these farms.

The underground exploration programme will determine the orientation and grade of the potential resource underlain by these two farms. A detailed feasibility study and mining work programme will be conducted at this stage.

### **2.1 Listed and specified activities**

The legal requirement for Environmental Authorisation for a Mining Right came into effect after the promulgation of the NEMA 2014 EIA Regulations on 8th December 2014. Prior to this, Mining Rights were subjected to the provisions of the MPRDA (2002). In this regard, a Mining Right and Environmental Authorisation are required in terms of the MPRDA (2002) and NEMA 2014 EIA Regulations (as amended), respectively. The applicable NEMA listed activities anticipated to be triggered by this project are listed below.

- **GN R983 (as amended by R327)** Activities 10, 12, 19 & 24.
- **GN R984 (as amended by R325)** Activities 4, 6, 7, 15 & 17.
- **GN R985 (as amended by R324)** Activities 2, 3, 4, 7, 10, 12 & 14.

### **2.2 Description of the activities to be undertaken**

Bonne Esperance 356 LR and Too Late 359 LR are to the west of the farms Langbryde 324 LR and Old Langsine 360 LR and to the north of the farms Rosamond 357 LR and Millstream 358 LR which form part of the current Mining Right held by Waterberg.

Geologically, the known mineralized zone of the Bushveld Complex underlain by these two farms are downdip of the known sub-crop position on the farm Old Langsine at an approximate depth of 1 200m.

The farms are situated in the mountainous area of the Makgabeng Plato, previous specialist environmental studies showed that the farms are included within a protected area. Because of these facts, surface exploration on the farms will not be possible. As stated above, it is the intention of Waterberg to execute an underground exploration programme once the underground development from the current Mining Area reaches these farms.

The underground exploration programme will determine the orientation and grade of the potential resource underlain by these two farms. A detailed feasibility study and mining work programme will be conducted at this stage.

## 2.3 Relevant policy and legislation

This section provides an overview of the governing legislation identified which may relate to the Waterberg Extension Project.

### 2.3.1 Constitution of the Republic of South Africa, Act No. 108 of 1996 as Amended (“the Constitution”)

Environmental legislation is shaped by the Bill of Rights of the Constitution of the Republic of South Africa.

Section 24 states: “*Everyone has the right—*

- a) to an environment that is not harmful to their health or well-being; and*
- b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—*
  - i. prevent pollution and ecological degradation;*
  - ii. promote conservation; and*
  - iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.*

This right is binding on the State and people, both natural and juristic. Sustainable development is the cornerstone of South Africa's environmental law regime.

In fulfilment of its constitutional mandate to take reasonable legislative measures that give effect to section 24 of the Constitution, the Government has promulgated several environmental laws since 1994. These laws provide a legal framework that embodies internationally recognised legal principles.

The framework legislation governing activities that affect the environment is NEMA.

#### Reference to where applied:

The Basic Assessment Report (“**BAR**”) process is being undertaken to determine the impacts associated with the proposed extension of the Mining Area by including the Extension Area (“**Waterberg Extension Project**”), including environmental, social and economic impacts. As part of the BAR process, mitigation measures and monitoring plans are recommended to ensure that any potential impacts are managed to acceptable levels to support the rights as enshrined in the Constitution. The Waterberg Extension Project must prove to be sustainable and balance the social, economic and environmental aspects of sustainable development.

#### How does this development comply with and respond to the policy and legislative context:

The environmental management objectives of the project is to protect ecologically sensitive areas and to support sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development.



The implementation of the mitigation and management measures to minimise and prevent negative impacts associated with the project, are contained in Waterberg's approved EMPr, which will remain applicable to the proposed Extension Area.

### **2.3.2 Mineral and Petroleum Resources Development Act, No. 28 of 2002 (MPRDA)**

The MPRDA is aimed at the equitable access and the sustainable development of the country's mineral resources. It provides mechanisms that will ensure the protection of the environment throughout the LoM.

Social and environmental sustainability is enhanced through the requirement to submit a social and labour plan ("SLP"), which contains a company's commitments to sustainable social development. This includes commitment to training and social investment, also with the goal of transferable skills that can be used after mine closure.

The MPRDA outlines the procedural requirements an applicant must follow to obtain a right to proceed with mining, which includes that the applicant must obtain an EA in terms of the NEMA.<sup>1</sup> The MPRDA is administered by the Department of Mineral Resources and Energy ("DMRE") and governs the sustainable utilisation of South Africa's mineral resources.

In support of a mining right application, the applicant is required to compile a Scoping Report and EIAR/EMPr; conduct a consultation process with I&APs, including making the Scoping Report and EIAR/EMPr available for comment; and compile a CRR that needs to be submitted to the DMRE for adjudication.

Section 37 of the MPRDA requires that all mining and prospecting operations and related activities are to be carried out in terms of section 2 of NEMA, which contain environmental management principles.

#### Reference where applied:

An application for the proposed amendment of the IEA was submitted to the DMRE on 6 September 2022. This BAR, which relates specifically to the Waterberg Extension Project applied for, has been compiled in accordance with the MPRDA.

#### How does this development comply with and respond to the policy and legislative context:

This BAR has been compiled in accordance with the requirements of the NEMA EIA Regulations, 2014 (as amended), with the environmental management objective to protect ecologically sensitive areas.

This BAR will be submitted to the DMRE, after consultation with I&APs.

### **2.3.3 National Environmental Management Act, No. 107 of 1998 (NEMA)**

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<sup>1</sup> Section 5A of the MPRDA indicates that: "No person may prospect for or remove, mine, conduct technical co-operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without – (a) an environmental authorisation,"

One of the purposes of NEMA is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment.

In terms of the 2014 EIA Regulations, an applicant is required to appoint an EAP to undertake the EIA/BAR, as well as conduct the PPP. In South Africa, EIA's became a legal requirement in 1997, with the promulgation of regulations under the Environment Conservation Act, No. 73 of 1989 ("**ECA**"). Subsequently, NEMA was enacted in 1998.

Section 24(2) of NEMA empowers the Minister of Forestry, Fisheries and the Environment ("**Environmental Minister**") and any MEC, with the concurrence of the Environmental Minister, to identify activities which must be considered, investigated, assessed and reported on to the CA responsible for granting the relevant EA. On 21 April 2006 the Minister of the then DEAT promulgated EIA Regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended in June 2010 and again in December 2014 (being the 2014 EIA Regulations). The 2014 EIA Regulations are applicable to the Waterberg Project.

The 2014 EIA Regulations objective is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the activities that have been identified. The purpose of these procedures is to provide the CA with adequate information to make decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised; and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

In accordance with the provisions of sections 24(5) and 44 of the NEMA, the Environmental Minister has published the 2014 EIA Regulations, which sets out the process for conducting EIAs to apply for, and be granted, an EA. These Regulations provide a detailed description of the EIA/BAR process to be followed when applying for an EA or WML for any listed activity. The Regulations differentiate between an EIA and a simpler basic assessment process (required for activities listed in GNR 983 and 985 in *Government Gazette* 38282 of 4 December 2014 (GNR. 983 and 985)) and a more complete EIA/BAR process (activities listed in GNR 984 in *Government Gazette* 38282 of 4 December 2014 (GNR 984)). In the case of the Waterberg Extension Project there are activities triggered under GN R 984 and, as such, a full S&EIR process is necessary. On 7 April 2017, the 2014 EIA Regulations were amended and, accordingly, the activities as amended under GNR 324, 325 and 327 of *Government Gazette* 40772 of 7 April 2017 are applicable to the EA Application.

In terms of section 24C(2A) of NEMA, the Minister of Mineral Resources and Energy ("**Mining Minister**") is the CA to issue EAs under the NEMA and WMLs under NEM:WA for activities which are directly related to mining.

The Financial Provisioning Regulations were published under NEMA on 20 November 2015 (in GN R1147 of *Government Gazette* 39425 of 20 November 2015) (FP Regulations). The FP Regulations replace section 41 of the MPRDA and Regulations 53 and 54 of the Mineral and Petroleum Resources Development Regulations (published in GN R527 of *Government Gazette* 26275 on 23 April 2004). The purpose of the FP Regulations is to regulate the determination and furnishing of financial provision for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. Under Regulation 5, financial provision must be made for:

*“(a) rehabilitation and remediation;  
(b) decommissioning and closure activities at the end of prospecting, exploration, mining or production operations; and  
(c) remediation and management of latent or residual environmental impacts which may become known in future, including the pumping and treatment of polluted or extraneous water.”*

Section 28(1) of NEMA states that “every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring”. If such degradation / pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:

- assessing the environmental impact;
- informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- ceasing, modifying or controlling actions which cause pollution/degradation;
- containing pollutants or preventing movement of pollutants;
- eliminating the source of pollution; and
- remedying the effects of the pollution.

The applicant has a responsibility to ensure that the Waterberg Extension Project and the BAR process conform to the principles of NEMA. It is obliged to take actions to prevent pollution or environmental degradation, in terms of section 28 of NEMA and ensure that the environmental impacts associated with the Waterberg Extension Project are considered and mitigated where possible.

The NEMA National Appeal Regulations (published in GN R993 of *Government Gazette* 38303 on 8 December 2014) make provision for an administrative appeal to be lodged against any decision issued by the relevant CA. In terms of these Regulations, an appeal must be lodged with the relevant CA in writing within 20 days of the date on which notification of the decision (the EA) was sent to the applicant or IAP (as applicable). The applicant, the decision-maker, I&APs and relevant organ of state must submit their responding statement, if any, to the appeal authority and the appellant within 20 days from the date of receipt of the appeal submission.

#### **2.3.4 National Water Act, No. 36 of 1998 (“NWA”)**

The NWA also has a role to play in regulating mining. Mining almost always uses water and/or has an impact on a water resource such as a stream, wetland or river. The NWA is administered by the Department of Water and Sanitation (“DWS”).

The section 21 of the NWA defines eleven water uses that require an integrated water use licence (“WUL”) or another authorisation:

*“21 (a): taking water from a water resource;  
21 (b): storing water;  
21 (c): impeding or diverting the flow of water in a watercourse;  
21 (d): engaging in a stream flow reduction activity contemplated in section 36;*

- 21 (e): engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);*
- 21 (f): discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;*
- 21 (g): disposing of waste in a manner, which may detrimentally impact on a water resource;*
- 21 (h): disposing in any manner of water, which contains waste from, or which has been heated in, any industrial or power generation process;*
- 21 (i): altering the bed, banks, course or characteristics of a watercourse;*
- 21 (j): removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and*
- 21 (k): using water for recreational purposes.”*

Where a water use cannot be authorised as a Scheduled 1 Use (permissible use without an authorisation requirement), a permissible water use in terms of section 22 of the NWA; or as a General Authorisation, a WUL must be obtained and an application in terms of sections 40 and 42 of the NWA must be submitted.

As noted above, the entire Project will require a WUL for water uses in terms of sections 21(a), (b), (c), (i), (g) and (j) of the NWA and the Project IWULA will be submitted to the DWS in due course.

*Reference to where applied:*

An IWULA and an associated IWWMP are required in terms of section 21 of the NWA for the entire Waterberg Project and will be submitted to DWS for the applicable section 21 water uses.

*How does this development comply with and respond to the policy and legislative context:*

An IWULA will be submitted to the DWS for the triggered water uses under section 21 of the NWA.

The NWA defines wetlands as:

*“land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.”*

Wetlands are protected by the NWA and conventions, as they are recognised as a valuable resource. In terms of the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention, 1975), to which South Africa is a party, the Contracting Parties must formulate and implement planning, so as to promote, as far as possible, the wise use of wetlands in their territory (Article 3.1). Additionally, in terms of the Convention on Biological Diversity, to which South Africa is also a party, it is considered a duty to conserve wetlands and to rehabilitate them.

**Government Notice no. 704 (4 June 1999) on the Use of Water for Mining and Related Activities aimed at the Protection of Water Resources**

**Summary of the Government Notice:**

Mining and associated infrastructure development is guided by the provisos in the GN, particularly Regulations 3, 4, 6 and 7, which are described as follows:

- **Regulation 3** – this Regulation states that the Minister of Water and Sanitation may, in writing, authorize an exemption from the requirements of Regulations 4, 5, 6, 7, 8, 10, or 11 on his or her own initiative or on application, subject to conditions determined by him or her.
- **Regulation 4** – this Regulation addresses the locality of developments, where estimated flood zone widths are set as buffer zones for development, or zone widths are prescribed. These include the following:
  - No facility, including residue deposits, dam, reservoir to be located within the 1:100-year floodline or within 100m from any watercourse, borehole or well.
  - No underground or opencast mining or any other operation or activity under or within the 1:50-year floodline or within a horizontal distance of 100m, whichever is the greatest.
  - No disposal of any residue or substance likely to cause pollution of a water resource in the workings of any underground or opencast mine.
  - No placement of any sanitary convenience, fuel depots or reservoir for any substance likely to cause pollution within the 1:50-year floodline.
- **Regulation 6** – this Regulation requires every person in control of a mine or activity to -
  - confine any unpolluted water to a clean water system, away from any area;
  - design, construct, maintain and operate any clean water system at the mine or activity so that it is not likely to spill into any dirty water system more than once in 50 years;
  - collect the water arising within any dirty area, including water seeping from mining operations, outcrops or any other activity, into a dirty water system;
  - design, construct, maintain and operate any dirty water system at the mine or activity so that it is not likely to spill into any clean water system more than once in 50 years;
  - design, construct, maintain and operate any dam or tailings dam that forms part of a dirty water system to have a minimum freeboard of 0.8 metres above full supply level, unless otherwise specified in terms of Chapter 12 of the NWA; and
  - design, construct and maintain all water systems in such a manner as to guarantee the serviceability of such conveyances for flows up to and including those arising as a result of the maximum flood with an average period of recurrence of once in 50 years.
- **Regulation 7** – this Regulation addresses the measures to protect water resources and includes the collection and re-use, evaporation or purification of water containing waste; measures to be taken to minimize the flow of any surface water into any mine or opencast workings; prevention of erosion or leaching of materials from any stockpile; and ensuring that process water is recycled as far as practicable.

**2.3.5 National Environmental Management: Waste Act, No. 59 of 2008 (“NEM:WA”)**

NEM:WA lists activities that will be triggered for the Waterberg Project and duties for the management of waste that will be generated as part of this Project to prevent environmental pollution and littering.

It defines waste broadly as "*any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered*" and includes all wastes defined in Schedule 3 of NEM:WA. NEM:WA now regulates mining residue deposits or stockpiles (discussed below).

Section 16 of the NEM:WA must also be considered which states as follows:

A holder of waste must, within the holder's power, take all reasonable measures to-

- Avoid the generation of waste and, where such generation cannot be avoided, minimise the toxicity and amounts of waste that are generated;
- Reduce, re-use, recycle and recover waste;
- Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour, or visual impacts;
- Prevent any employee or any person under his or her supervision from contravening the Act; and
- Prevent the waste from being used for unauthorised purposes.

These general principles of responsible waste management will be incorporated into the requirements in the EMP, to be implemented for the Waterberg Project.

The NEM:WA provides for specific waste management measures to be implemented, as well as providing for the licensing and control of waste management activities.

It is necessary to hold a WML for waste management activities listed in the NEM:WA List. The NEM:WA List is separated into three categories i.e., Category A, Category B or Category C.

An application for a WML (WMLA) must be supported by an EIA that complies with the 2014 EIA Regulations. An integrated process covering NEMA and NEM:WA activities is being undertaken. The procedures for licensing waste management activities are stipulated in Chapter 5 of NEM:WA and have been included in the overall S&EIA process.

Category C activities do not require a WML but must comply with the Norms and Standards for Storage of Waste (DEA, 2013). Such facilities need to be registered with the DEA 90 days before construction commences.

Classification of waste streams are required in terms of GNR 634 (published in *Government Gazette* 36784 on 21 August 2013), to ensure that the correct waste management standards and disposal methods are implemented.

GNR 635 (published in *Government Gazette* 36784 on 23 August 2013, provides the National Norms and Standards for Disposal of Waste to Landfill (Landfill Norms)). This includes liner requirements and design specifications. Type 3 waste may only be disposed of where a Class C liner is used in terms of the Landfill Norms

or alternatively an alternative barrier system (if it can be demonstrated to the DWS that the material performs the same, if not better, than a Class C liner) (in accordance with an approach generally agreed to by the DWS).

Reference where applied:

The listed activities which are triggered under the NEM:WA have been authorised in the approved Mining Right and IEA.

How does this development comply with and respond to the policy and legislative context:

Domestic waste is currently disposed of at the Senwabarwana waste disposal facility. NEMWA is not applicable to the Extension Area however mitigation measures will be implemented for any unintended waste that could cause pollution and contamination to the Extension Area.

**2.3.6 National Environmental Management: Air Quality Act, No. 39 of 2004  
("NEM:AQA")**

The National Environmental Management: Air Quality Act, No. 39 of 2004 (as amended) (NEM:AQA) is the main legislative tool for the management of air pollution and related activities. The objectives of NEM:AQA are to protect the environment by providing reasonable measures for:

- the protection and enhancement of air quality in South Africa;
- the prevention of air pollution and ecological degradation;
- securing ecologically sustainable development, while promoting justifiable economic and social development; and
- generally, to give effect to section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and wellbeing of people.

The NEM:AQA mandates the Environmental Minister to publish a list of activities which result in atmospheric emissions and consequently cause significant detrimental effects on the environment, human health and social welfare (AQA List). The AQA List and Minimum National Emission Standards were published in GN 893 of *Government Gazette* No. 37054 on 22 November 2013, and lists atmospheric emissions for which an atmospheric emissions licence (AEL) will be required. Examples of such activities include the use of combustion installations, storage of petroleum products, slag processes, carbonisation and coal gasification, mineral processing and disposal of hazardous and general waste by way of incineration. The Waterberg Extension Project will not require an AEL.

According to the NEM:AQA, air quality management control is regulated by the local Government, with district and metropolitan municipalities as the licensing authorities. Provincial Government is primarily responsible for ambient monitoring and ensuring municipalities fulfil their legal obligations, with national Government primarily as the policy-maker and coordinator. Each sphere of Government must appoint an Air Quality Officer responsible for co-ordinating matters pertaining to air quality management.

The National Pollution Prevention Plans Regulations, which came into effect on 21 July 2017, tie in with the National Greenhouse Gas Emission Reporting Regulations which took effect on 3 April 2017. In summary, these Regulations aim to prescribe the requirements that pollution prevention plans of greenhouse gases declared as priority air pollutants need to comply with, in terms of the NEM:AQA. The Regulations specify who needs to comply, and by when, as well as prescribing the content requirements. Mines have an obligation to report on the GHG emissions under the Greenhouse Gas Emission Reporting Regulations.

Of further importance is to note that the Waterberg Project falls within the Waterberg Bojanala Air Quality Priority Area ("WBPA"), in terms of section 18(1) of NEM:AQA. The Air Quality Management Plan for the WBPA must be taken into account when considering activities in the area and effect must be given to the goals of the Air Quality Management Plan.

Reference where applied:

An Air Quality Assessment has been undertaken as part of the initial EIA process to determine the baseline conditions prior to the implementation and potential subsequent impacts. Air quality monitoring is currently being conducted in and around the proposed infrastructure areas within the Mining Area to further determine baseline conditions.

How does this development comply with and respond to the policy and legislative context:

The mitigation and management measures to be implemented as part of the Project aim to manage and prevent potential impacts to air quality.

### **2.3.7 The National Heritage Resources Act, No. 25 of 1999 ("NHRA")**

The purpose of the National Heritage Resources Act, No. 25 of 1999 (NHRA) is to ensure that the heritage resources which are of cultural significance, as described in section 3 of the NHRA, will be protected. The protection of heritage resources is overseen by the South African Heritage Resources Agency ("SAHRA") and provincial heritage resources authorities, dependant on the heritage resources in question.

Under section 34 of the NHRA structures which are older than 60 years may not be demolished without a permit issued by the relevant provincial heritage resources authority.

Section 35 of the NHRA deals with archaeological, paleontological and meteorite heritage resources and requires that any archaeological or paleontological objects that are found on site must be reported to the competent heritage resources authorities. The discovered archaeological or paleontological objects may not be removed, damaged or destroyed without obtaining a permit from the heritage resources authority.

Section 38 of the NHRA requires that SAHRA must be informed of any proposed development that exceeds 5 000m<sup>2</sup> prior to undertaking the development. SAHRA may then require a heritage impact assessment ("HIA") to be conducted before it consents to the development.

Where an HIA is undertaken as part of the EIA process and an applicant for an EA complies with the requirements of the relevant heritage authorities, then such an applicant is exempted from having to comply with the other



provisions in Part 2 of Chapter 2 of the NHRA, including the requirement to obtain permits for the: alteration or demolition of any structure or part of a structure which is older than 60 years; destruction, damage, excavation, alteration, sale or disturbance of any archaeological and palaeontological artefacts or meteorites; or destruction, damage, alteration, exhumation or removal from its original position or disturbance of any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority as contemplated in section 36 of the NHRA.

### **Chance finds subsequent to the EIA/BAR Process**

The NHRA states that human remains older than 60 years and younger than 100 years are protected by the NHRA. Procedures for the removal of graves are set out in section 36(5) of the NHRA, including procedures for consultation regarding burial grounds and graves where such graves are situated outside a formal cemetery administered by a local authority. If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are younger than 60 years are protected under section 2(1) of the Removal of Graves and Dead Bodies Ordinance, No. 7 of 1925, and are under the jurisdiction of the National and Provincial Department of Health. Final approval for removal of human remains must be submitted to the office of the relevant Provincial Premier. This function is generally delegated to the Provincial MEC for Local Government and Planning or, in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated and the relevant local or regional council to where the grave is being relocated. To handle and transport human remains, the institution conducting the relocation must be authorised under the National Health Act and the Regulations relating to the Management of Human Remains (Published under Government Notice R363 in *Government Gazette* 36473 of 22 May 2013).

For this, a specific procedure should be followed which includes social consultation. For graves younger than 60 years, only an undertaker is needed. For those older than 60 years and unknown graves an undertaker and archaeologist is needed. Permits should be obtained from the Burial Grounds and Graves unit of SAHRA. This procedure is quite lengthy and involves social consultation.

### **Reference where applied:**

In accordance with the legislative requirements and EIA rating criteria, the regulations of SAHRA and Association of Southern African Professional Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible Heritage Impact Assessment (HIA) is compiled. This has been compiled for the initial Mining Right application and during the prefeasibility phase of the current Waterberg project.

### **How does this development comply with and respond to the policy and legislative context:**

The applicable legislation will be followed in terms of sensitive historical features such as buildings and graves prior to any possible construction activities should infrastructure be required on the farms in future. As indicated above, currently only underground exploration and mining activities are planned in the Extension Area. A comprehensive Heritage Impact Assessment has been conducted in order to identify sensitive historical features

on the Mining Area and mitigation measures have been proposed in order to ensure the preservation and protection thereof.

### **2.3.8 National Environmental Management: Biodiversity Act, No. 10 of 2004 (“NEM:BA”)**

The overarching aim of the National Environmental Management: Biodiversity Act, No. 10 of 2004 (NEM:BA), within the framework of NEMA, is to provide for the:

- management and conservation of biological diversity within South Africa, and of the components of such biological diversity;
- use of indigenous biological resources in a sustainable manner; and
- fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources.

Certain portions of the entire Waterberg Project fall within CBAs, as identified in the Waterberg District Environmental Management Framework Report and SANBI BGIS Map viewer and Vhembe Bioregion.

The BAR will therefore take the following Regulations promulgated in terms of NEM:BA into consideration:

- GN 1002 of 9 December 2012, containing the National List of Ecosystems that are threatened and in need of protection, promulgated in terms of section 52(1)(a) of NEM:BA;
- GN R152 of 23 February 2007, which are the Regulations regarding Threatened or Protected Species. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems and preserving sites of exceptionally high conservation value; and
- GNR151 of 23 February 2007, containing the List of Critically Endangered, Endangered, Vulnerable and Protected Species.

Under NEM:BA, if any listed ecosystems, threatened, endangered or vulnerable species or protected species will have to be removed or will be disturbed, a permit will be required.

Other objectives of NEM:BA include the identification, control and eradication of declared weeds and alien invaders in South Africa. These are categorised in the Alien and Invasive Species Regulations (published in GN R151 of *Government Gazette* 29657 of 23 February 2007) and the Alien and Invasive Species Lists (published in GN R864 of *Government Gazette* 40166 on 29 July 2016), according to one of the following categories, and require control or removal:

- Category 1a Listed Invasive Species: are those species listed as such by notice in terms of section 70(1)(a) of NEM:BA as species which must be combated or eradicated;
- Category 1b Listed Invasive Species: are those species listed as such by notice in terms of section 70(1)(a) of NEM:BA as species which must be controlled;

- Category 2 Listed Invasive Species: are those species listed by notice in terms of section 70(1)(a) of NEM:BA as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be; and
- Category 3 Listed Invasive Species: are species that are listed by notice in terms of section 70(1)(a) of NEM:BA as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A, as specified in the Notice.

The provisions of NEM:BA have been considered and, where relevant, will be incorporated into the mitigation measures and requirements of the approved EMPr and any required permits will be obtained. A fauna and flora impact assessment for developments in an area that are considered ecologically sensitive which require an EA in terms of NEMA is important and a Biodiversity Assessment has been commissioned and the findings included in the EIAR. As indicated above, currently only underground exploration and mining activities are planned over the Extension Area.

Reference where applied:

A Terrestrial Ecology Assessment was undertaken during the compilation of the initial EIA for the Mining Right application. An Environmental Baseline Assessment was also completed during the prefeasibility stage of the Waterberg Project.

How does this development comply with and respond to the policy and legislative context:

The mitigation and management measures to be implemented as part of the Waterberg Project aim to manage and conserve biological diversity, as well as to minimise alien invasive species.

### **2.3.9 The Conservation Of Agricultural Resources Act, No. 43 of 1983 ("CARA")**

CARA provides for control over the utilization of the natural agricultural resources in South Africa in order to promote the conservation of the soil, water resources and vegetation and the combating of weeds and invader plants; and for matters connected therewith.

In terms of CARA, landowners are legally responsible for the control of weeds and alien vegetation. CARA makes provision for three categories of alien and invasive species:

- *Category 1a*: invasives that must immediately be removed and destroyed;
- *Category 1b*: invasives that need to be immediately removed and contained;
- *Category 2*: invasives that require a permit to retain the species on site and where steps are required to ensure that they do not spread. All category 2 plants in riparian zones need to be removed; and
- *Category 3*: a permit is required to retain these species. All category 3 plants in riparian zones need to be removed.

CARA also regulates the conservation of soil and states that degradation of the agricultural potential is illegal. It furthermore requires the protection of land against soil erosion and the prevention of water logging and associated salinization.

Reference where applied:

A Soil, Land Capability, Agricultural Potential and Hydropedology Assessment was undertaken during the compilation of the initial EIA for the Mining Right application.

How does this development comply with and respond to the policy and legislative context:

Section 12 of the CARA details the maintenance of soil conservation in which every land user will be responsible for the maintenance and conservation of soil. The mitigation measures recommended as part of the EMPr aim to prevent the compaction, erosion and degradation of the soil resources.

**2.3.10 National Forests Act, No. 84 of 1998 (“NFA”)**

Section 12 of the NFA gives power to the Environmental Minister to declare certain trees as protected species. The latest list has been promulgated under GN R908 of *Government Gazette* 38215 on 21 November 2014. Section 15 of the NFA indicates that no protected species may be cut, disturbed, damaged or destroyed without a licence granted by the Department of Forestry, Fisheries and the Environment (“DFFE”).

Reference where applied

A Terrestrial Biodiversity Study has been done to determine the tree species in the Mining Area and specifies if there are any endangered species. A permit for the removal / destruction of protected trees will be applied for with the relevant department in terms of section 15 of the NFA. As mentioned above, there are currently only underground exploration and mining activities planned over the Extension Area.

**2.3.11 National Environmental Management: Protected Areas Act, No. 57 of 2003 (“NEMPAA”)**

The protection and management of South Africa’s protected areas are controlled by the NEMPAA.

NEMPAA provides for *inter alia*:

- the declaration of nature reserves and determination of the type of reserve declared;
- cooperative governance in the declaration and management of nature reserves;
- a system of protected areas to manage and conserve biodiversity; and
- the utilization and participation of local communities in the management of protected areas.

It provides that, despite other legislation, no person may conduct prospecting or mining activities in special nature reserves or protected areas without the prior consent of the Mining Minister and the Environmental Minister. NEMPAA binds all state organs and trumps other legislation, including the MPRDA, in the event of a conflict concerning the development of protected areas.

The Mining Area, though partly situated in a CBA and the Vhembe Bioregion, will not traverse any area protected under NEMPAA and consent is therefore not required.

Reference where applied:

A Terrestrial Ecology Assessment has been undertaken to determine whether any protected areas are located within the Mining Area.

There are currently no protected areas within the Mining Area.

How does this development comply with and respond to the policy and legislative context:

No action is required as mining is not taking place within a protected area.

**2.3.12 Spatial Planning and Land Use Management Act, No. 16 of 2013 (“SPLUMA”)**

SPLUMA is a framework law, which means that the law provides broad principles for a set of provincial laws that will regulate planning for South Africa. It introduces provisions to cater for development principles; norms and standards; inter-governmental support; SDFs across national, provincial, regional and municipal areas; LUSs; and municipal planning tribunals.

SPLUMA also provides clarity on how planning law interacts with other laws and policies. It is a uniform, recognisable and comprehensive system that addresses the past spatial and regulatory imbalances; and promotes optimal exploitation of mineral resources. It achieves this by strengthening the position of mining right holders when land needs to be rezoned for mining purposes. SPLUMA's impact on optimal exploitation is particularly evident where conflict exists between mining right holders and landowners. Economic and policy considerations, as well as practical necessities, often motivate the State to grant mining rights to entities other than landowners. SPLUMA is a new national framework Act that provides clear principles and standards for provincial and local Governments to formulate their own new spatial planning and land use policies. The new provincial legislation can regulate, among other things, land development, land use management, spatial planning and municipal planning.

Reference where applied:

The entire Mining Area is currently zoned as agriculture.

How does this development comply with and respond to the policy and legislative context:

The affected properties would have to be rezoned from agriculture to mining in order for the operations to continue. The application for rezoning will be made in the near future.

**2.3.13 Explosives Act, No. 26 of 1956**

A licence will be required for any explosive magazines on the premises used for the storage of explosives. The licence is issued by the Chief Inspector of Explosives or his delegate.

Reference where applied:

A licence will be required for any explosive magazines on the premises used for the storage of explosives. The licence is issued by the Chief Inspector of Explosives or his delegate.

*How does this development comply with and respond to the policy and legislative context:*

The applicant will apply for a permit should it become necessary to construct an explosives magazine. This is a separate application and will be submitted to the South African Police Service.

### **2.3.14 Spatial Development Policies**

#### **The National Development Plan 2030 (“NDP”)**

The NDP is a long-term development framework and plan for South Africa and was released in August 2012. All major development policies and strategies of district and local municipalities find expression in the NDP. The NDP must be referred to when determining the socio-economic impacts of a development or project on the surrounding area.

#### **Capricorn District Municipality Integrated Development Plan (2016/17-2020/21)**

An IDP is the document through which a municipality prepares its strategic development plans for a five-year period. The main goal of an IDP is to develop interdepartmental strategies and developmental goals for the Capricorn District Municipality (“CDM”).

The CDM IDP recognises that mining is one of the key economic sectors and, according to the IDP, mining is one of the sectors that must form the base for economic growth.

It further recognises that mining holds major possibilities for the district and that the utilisation of the mining sector can serve as a catalyst for the development of other economic activities.

The CDM IDP also refers to the Capricorn District SDF and particularly to the set of principles which was used to draft the SDF. One of these principles focused on the optimal utilisation of mining potential within the district in such a way that a sustainable balance will be maintained between mining, agriculture, and the natural environment.

### **2.3.15 Other Acts, Guidelines and Plans Considered**

Provincial legislation and other guidelines considered by the specialists include amongst others:

- Limpopo Environmental Act, No. 7 of 2003 – makes provision for the protection of terrestrial and aquatic biodiversity;
- The Limpopo Conservation Plan of 2013 - was designed to support integrated development planning;
- Limpopo Environmental Implementation Plan 2015 - 2020 (published under PN 64 of PG 2715 on 10 June 2016) - describes policies, plans and programs of different state departments (such as the provincial Department of Economic Development, Environment and Tourism) that perform functions that may

impact on the environment and how the departments' plans should comply with NEMA's principles and National Environmental Norms and Standards;

- International Finance Corporation Environmental, Health and Safety Guidelines for Mining - the IFS guidelines recommended noise levels for noise sensitive areas is 55.0dBA during the day and 45.0dBA during the night;
- United States Bureau of Mines - USBM (1980) Structure response and damage produced by ground vibration from surface mine blasting - USBM 1980, provides limits for ground vibration levels resulting from blasting. Ground vibration levels as a result of blasting should not exceed 10,0m/s for clay huts and 25.0mm/s for brick or formally constructed buildings;
- NEMA Implementation Guidelines: Sector Guidelines for Environmental Impact Assessment Regulation (published in GN 654 of *Government Gazette* 33333 on 29 June 2010) - this guideline provides guidance on how to compile EIAs containing information and analysis of a high quality, and which is sufficiently comprehensive to enable the decision-maker to make a well-informed decision. It explains the requirements in the EIA Regulations and provides practical guidance and tools for the EIA process;
- DEAT (2004); Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria - this guideline provides information on cumulative effect assessments, integrated environmental management, and highlights the potential approaches for incorporating cumulative effects into EIAs;
- DEA (2011); A User-Friendly guide to the National Environmental Management: Waste Act, 2008. South Africa, Pretoria - this guide gives a simplified overview of the contents and application of NEM:WA. It also covers processes or directions on how to manage polluted land and develop industry waste management plans. It provides guidance and information on the licensing of waste management activities, waste information, compliance and the consequences for non-compliance NEM:WA;
- DEAT (2004); Criteria for determining Alternatives in EIA, Integrated Environmental Management, Information Series 11 - this document provides an overview of the key criteria for determining project alternatives, in the EIA Process;
- Guideline for Implementation: Public Participation in the EIA Process (published in GN 807 of *Government Gazette* 35769 on 10 October 2012) - assists applicants, I&APs and EAPs to understand their roles in the PPP. It provides information on the benefits of the PPP and guidance on conducting the PPP; and
- DEA (2017), Guideline on Need and Desirability, Department of Environmental Affairs Integrated Environmental Management, Information Series 11 (Guideline) - This guideline contains information on best practice and how to meet the peremptory requirements prescribed by legislation. It sets out both the strategic and statutory context for the consideration and of the need and desirability of a development.

NEMA and the EIA Regulations highlight specific considerations that must be taken into account for every application for an EA, including the principles set out in section 2 of NEMA, the general objectives of Integrated Environmental Management set out in section 23 of NEMA, minimum requirements set out in section 24(4) of NEMA and criteria set out in section 24O of NEMA and in Regulation 18 of the 2014 EIA Regulations. In terms of the 2014 EIA Regulations, when considering an application, the relevant CA must have regard to various specific relevant considerations, including specifically having to consider “*the need for and desirability of the activity*”. The EIA Regulations appendices specify that the scoping report and EIA Report provide a motivation for the need for and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location. It requires that both the “need” and “desirability” must be considered by the developer,

his/her independent EAP, the specialists, and the CA. I&APs must also be afforded an opportunity to make representation in terms of their views in terms of the need and desirability considerations.

## **2.4 Need and desirability of project**

### **2.4.1 Platinum as an important resource**

This section is an extract from the approved EIA compiled for the initial Mining Right application. It examines the Waterberg Project's need and desirability and the importance of PGMs as a resource and the desirability of Waterberg's mining operations on the Mining Area.

The market and prices for platinum, palladium and associated PGMs have continued to be volatile. Waterberg relies on research from various third parties to assist in the analysis and understanding of supply and demand trends.

Autocatalysis and pollution control in the automotive sector have historically been the primary demand driver for both platinum and palladium. Based on global automotive trends, palladium and rhodium have vastly outperformed platinum since 2016. The Volkswagen emissions scandal has had an extremely negative impact on the European diesel market and the perception of diesel technology globally. Platinum has historically been used in diesel autos for autocatalysis and that demand segment has been weakening. It is expected that this trend will continue. Gasoline and hybrid automotive technology has been the primary benefactor. Palladium and rhodium are used as the primary catalysts in gasoline and hybrid automobiles. The gasoline and hybrid markets are expected to continue to grow, particularly in China where stringent new emissions legislation is expected to increase palladium consumption significantly. There is a great deal of discussion concerning BEV. Although BEV technology is currently less than 1% of the global auto market, there are projections for this market to grow. BEV technology does not require an autocatalyst and is thus considered a significant threat to PGM metals demand in general. The perceived growth of the BEV market has had a dampening effect on Waterberg's market sentiment.

On the supply-side, loss-making production from South African PGM miners has continued to be seen. Although there has been some consolidation and rationalization of supply, there is still a surplus of platinum production in the marketplace. Palladium has been in a multi-year deficit based on the strong demand discussed above and the lack and inability of additional supply response for the metal. Should the price delta between platinum and palladium become excessive, there is a possibility that autocatalyst manufacturers could substitute platinum for palladium and change the current supply and demand dynamic for both metals. Evidence of substitution in the current marketplace has not been seen.

In general, it is expected that continued volatility for all PGM metals going forward will be seen, as market participants grapple with shifting demand trends and challenging supply factors.

The Waterberg resource is palladium dominated which is a unique metal balance, compared with the traditional South African PGM reefs. Palladium is typically used in gasoline engines and legislative changes are already driving autocatalyst palladium loadings higher in Europe, North America and Japan, and there are expectations



that new regulations in China will be brought forward, driving further demand for the metal. Automotive demand for palladium is predicted to grow by around 2% in 2018.<sup>2</sup>

The predominance of palladium over platinum in the ore positions the Waterberg Project well as a future source of PGMs, especially as the supply side pressure grows on existing marginal PGM operations elsewhere in South Africa.

#### **2.4.2 Waterberg Project**

Mining in South Africa directly contributed to the establishment of the Johannesburg Stock Exchange in the late 19th century; and today it still accounts for a large portion of its market capitalisation. From this, it is clear that mining in South Africa has shaped South Africa politically, culturally, and economically and that the South African mining sector has provided the critical mass for a number of industries that are either suppliers to the mining industry, or users of its products. These include, but are not limited to, energy, financial services, water and engineering services, and specialist seismic, geological and metallurgical services. The Waterberg Project will not only contribute directly to the South African economy but will also contribute to the development and growth of other industries supporting the mining sector.

The Waterberg Project will contribute to favourable economic impacts on both a local, regional and national scale. This will result in numerous job creation and skills development opportunities and provide an economic injection in the region.

In terms of the Waterberg SLP, Waterberg has committed to various HRD and LED Projects. The proposed LED Projects include<sup>3</sup>:

- Provision of infrastructure and educational support to local schools: providing modular units or containers, called Digital Education Centres, in the form of a library and computer library centre, with equipment and material to three primary schools and one high school;
- Mine and community bulk water supply and reticulation: contributing financially towards the development of the water infrastructure. The project will be done in partnership with the Limpopo Provincial Government, DWS, CDM and Blouberg Local Municipality ("BLM");
- Extension and equipping of existing clinic / health facility: providing three additional consulting rooms to the existing clinic;
- Road Construction: constructing a 38km road to improve mobility in the area.

(Collectively the LED Projects).

If the Waterberg Project was not to proceed, the additional economic activity; skills development; LED and social upliftment; and jobs opportunities would not be created, and the platinum reserves would remain unutilized.

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<sup>2</sup> John Matthey – PGM Market Report May 2018.

<sup>3</sup> Page 52 of the Waterberg SLP.

In assessing the Waterberg Project's need and desirability, the potential negative impacts must be considered. These include:

## **Economic**

- Loss of access to livelihood activities:
  - Economic displacement refers to the loss of productive assets (including land and crops), usage rights or livelihood capacities as a result of the Waterberg Project.
  - Currently local communities could possibly make use of a wealth of natural resources, or ecosystem services, that are freely and readily available in the Mining Area. The primary ecosystem services include livestock grazing, subsistence farming, collecting wood for cooking, collecting water for drinking and gathering traditional herbs and medicine for household consumption and commercial use. These natural resources provide households with valuable sources of food, fuel, income and various other uses. The loss of access to, and/or availability of, these natural resources could have a detrimental impact on the livelihoods, including income and food security, of households in the Mining Area.
- Tensions over limited employment opportunities and procurement contracts:
  - While it is expected that a limited portion of the local population might be able to benefit from employment opportunities and procurement contracts from the Waterberg Project, a significant portion of the population will not obtain employment from the Project and will therefore need to continue subsistence farming in order to secure their livelihoods.
  - It is generally expected that subsistence farming will yield a lower and more uncertain income than that associated with employment from the Waterberg Project, and that community members who will benefit most from employment opportunities and procurement contracts are those with the highest levels of education and experience.
  - The employment of only a portion of the population for the Waterberg Project is thus likely to lead to increased tension and economic disparity in the Mining Area between those employed/contracted and those unemployed. The latter might find that they cannot maintain the same living standard or access existing or new services and facilities that are either exclusively for mine workers or are too expensive.
  - Mining can also contribute to the marginalisation of specific groups within a community, specifically the uneducated, illiterate, landless, elderly and women (particularly those with children).

## **Social**

- Migrant labour influx and increase in informal settlements as a result of influx:
  - On a project of this nature where there are high levels of unemployment and limited economic opportunities in the area, influx into the Mining Area is considered a significant impact. This is made harder by a lack of land management practices, which could result in illegal squatting in the communities neighbouring the Mine Surface Infrastructure Area.
  - Influx will most likely peak during the construction phase or commencement of mining phase when the demand for labour is at its highest. It is anticipated that job seekers who do not secure jobs will leave, however some may remain in hope of securing future project benefits.
- Increased pressure on social infrastructure and services as a result of influx.

- Increased livestock theft.
- Social unrest due to conflicts between work seekers and land occupants.
- Increase in social pathologies (teenage pregnancies, school drop-outs, alcohol and substance abuse).

## **Health and Safety**

- Increase in communicable diseases and other diseases such as HIV and TB.
  - The Waterberg Project has the potential to contribute to the spread of communicable diseases, such as HIV/AIDS and STDs or TB. Communicable diseases and STDs, particularly, if present and untreated, can greatly increase the risk of HIV transmission. In the communities neighbouring the Mine Surface Infrastructure Area, existing healthcare services do not have the resources to address the impact of increasing cases of communicable diseases.
- Increase in traffic and road accidents.

Numerous platinum mines occur to the south of the Mining Area near Mokopane. The Waterberg Project fits in with these developments and land uses. If Waterberg does not proceed with its Mining Right, mining of these platinum reserves will not necessarily be avoided, as the Mining Right can be sold and transferred to another company. Unless the Government declares these areas as restricted for mining and/or the demand for platinum subsidies, mining companies will continue to attempt to mine these platinum reserves.

By extending the Mining Area with the addition of the Extension Area, the above positive and negative impacts will potentially be influenced. It must be kept in mind (if the amendment is granted) that an underground prospecting programme will be commenced with once mining reaches the specific area. No surface mining or surface infrastructure is anticipated to be placed on the Extension Area.

## **2.5 Motivation for the overall preferred site, activities and technology alternative.**

The identification of alternatives is a key aspect of the success of the BAR process. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider in this application. There are, however, some constraints that have to be taken into account when identifying alternatives for a project depending on the scope. Such constraints include financial, social and environment related constraints. Alternatives can typically be identified according to:

- Activity alternatives.
- Location alternatives.
- Design or layout alternatives.
- Technology alternatives.
- Operational alternatives.
- No-Go alternative.

For any alternative to be considered feasible, such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. Alternatives are typically distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and/or Basic Assessment process. Incremental

alternatives typically arise during the Basic Assessment process and are usually suggested as a means of addressing/mitigating identified impacts (drilling and trenching in low sensitivity areas). These alternatives are closely linked to the identification of mitigation measures and are therefore not specifically identified as distinct alternatives.

For the purpose of this Waterberg Extension Project, the need and justification for alternatives was specifically guided by the relatively low sensitivity of the receiving socio-economic and biophysical environment, when kept in mind that all planned development will be conducted underground at an estimated depth of around 1 200 meters. The types of alternatives considered are presented below.

## **2.6 Full description of the process followed to reach the proposed preferred alternatives within the site.**

The proposed Extension Area is located on the farms Bonne Esperance 356 LR and Too Late 359 LR. The surrounding area is currently used for subsistence farming, informal settlements and tourism.

### **2.6.1 Details of the development footprint alternatives considered**

*the property on which or location where it is proposed to undertake the activity;*

The application area has been selected based on geological conditions determined by aerial geophysical surveys.

*the type of activity to be undertaken;*

Currently, no alternatives to the possible exploration and mining of platinum group metals have been considered.

*the design or layout of the activity;*

No designs or layouts has been planned or designed. This can only be conducted once the exploration activities have taken place.

*the technology to be used in the activity;*

No alternative in terms of the technology to be used have been considered.

*the operational aspects of the activity;*

The underground exploration programme will determine the orientation and grade of the potential resource underlain by the Extension Area. A detailed feasibility study and mining work programme will be conducted at this stage.

*the option of not implementing the activity.*

Mining contributes greatly to local economic stimulation through direct employment, business opportunities, royalties and tax revenues. If the platinum group metals reserves on the properties are not mined, South Africa and the local communities will forego the benefits of the associated employment, business opportunities, royalties and tax revenues.

## **2.7 Details of the public participation process followed**

The Public Participation Process (“PPP”) undertaken was designed to allow for provisioning of information about the proposed Extension Area in a manner that will enable stakeholders to provide comments or to request further details. Full details of the PPP are set out in the Consultation Report included hereto as Appendix 5. Below is a summary of the key PPP activities.

### **2.7.1 Legislative Process**

The inclusion of the Extension Area in terms of section 102 of the MPRDA. The section 102 application triggers Activity 21D of EIA listing notice 1 which requires a Basic Assessment to be completed.

As per the Acknowledgement of the Application provided by the DMRE the following is required:

- Public Participation as required in terms of Regulation 41 of the EIA Regulations; and
- Public Participation as required in terms of Section 24K of NEMA.

#### **2.7.1.1 Public Participation as required in terms of Regulation 41 of the EIA Regulations**

Regulation 41 requires the following actions:

- Placement of an advertisement in a local newspaper;
- Placement of a notice board on the boundary of the properties affected;
- Written notification to:
  - Landowners and/or occupiers of the affected properties;
  - Landowners/occupiers of adjacent properties;
  - The Municipal Ward Councillor;
  - The Blouberg Local Municipality; and
  - Any organ of state with jurisdiction.

#### **2.7.1.2 Public Participation as required in terms of Section 24K of NEMA**

Section 24K requires consultation with other relevant organs of state as determined by the Competent Authority. As per the acknowledgement letter, the Competent Authority (DMRE) has indicated that the BAR must be made available to the following organs of state for 30 days:

- Limpopo Department of Economic Development, Environment and Tourism;
- Eskom Holdings SOC Ltd;
- Department of Water and Sanitation;
- Department of Agriculture, Land Reform and Rural Development;
- South African Heritage Resources Agency;
- Capricorn District Municipality; and
- Blouberg Local Municipality.

## **2.7.2 Public Participation Process**

### **2.7.2.1 Interested and Affected Party (“IAP”) Register**

An application specific IAP register was compiled and included the following parties:

- Landowners and/or occupiers of the affected properties;
- Landowners/occupiers of adjacent properties;
- The Municipal Ward Councilor of Blouberg Local Municipality;
- Blouberg Local Municipality;
- Capricorn District Municipality;
- Any organ of state with jurisdiction;
- Limpopo Department of Economic Development, Environment and Tourism;
- Eskom Holdings SOC Ltd;
- Department of Water and Sanitation;
- Department of Agriculture, Land Reform and Rural Development; and
- South African Heritage Resources Agency.

The existing Waterberg JV Resources IAP register used for the original Mining Right application will not be used in this instance, but only the above relevant IAPs as indicated.

## **2.7.3 Notification of the Application**

The following notifications was done on 17 November 2022 at announcement of the Extension Project:

- An Advertisement was placed in the Polokwane Observer;
- On-site notices were placed at the property boundaries; and
- A notification with information on the application was sent to IAPs.

Notifications was sent via Email (where email addresses exists), via Fax (where only a fax number exists), via SMS (where a cell phone number is available).

## **2.7.4 Making available the Draft Basic Assessment Report to the required Organs of State**

Copies of the Draft Basic Assessment Report was submitted to the following organs of state and registered interested and affected parties on 13 January 2023:

The organs of state included:

- Limpopo Department of Economic Development, Environment and Tourism;
- Eskom Holdings SOC Ltd;
- Department of Water and Sanitation;
- Department of Agriculture, Land Reform and Rural Development;
- South African Heritage Resources Agency;
- Capricorn District Municipality; and
- Blouberg Local Municipality.

The commenting period provided was 30 calendar days. From 16 January to 15 February 2023.

## 2.7.5 Public Participation Reports

### 2.7.5.1 Comments and Response Report (CRR)

Comments was only received from the South African Heritage Resource Agency. The following comments were received:

Comment	Response
<p>The SAHRA Development Applications Unit (DAU) notes the submission of the draft BAR and EMPr reports however, as there has been no assessment of impacts to the heritage landscape by mining and blasting activities on heritage resources/sites sensitive to these activities located on the farms Bonne Esperance 356 LR and Too Late 359 LR, the SAHRA cannot make an informed decision on this application. There is still the risk of subsidence, vibrations and blasting on highly significant surface heritage resources.</p> <p>Due to the very sensitive nature of the Makgabeng Plateau, an assessment of impacts to heritage and palaeontology must be undertaken by the relevant heritage and palaeontological specialists as part of the Amendment Application. All heritage assessments (a total of 4) for the original Mine Right Application (Case ID 12878) did not assess the farms Too Late 359 LR and Bonne Esperance 356 LR and as such the significance ratings provided in the EMPr is based off of insufficient information. The application for non-substantive amendment is recommended to be reconsidered due to the lack of</p>	<p>After consideration of the concerns raised in your comments Waterberg JV is prepared to conduct the following to address your concerns:</p> <ol style="list-style-type: none"> <li>1. Conceptual geological modelling based on available information to determine the likely depth of the mineral resources on the two properties.</li> <li>2. Complete a high-level blasting assessment / statement to indicate the potential vibration levels at surface level and the potential risk to heritage resources possibly on surface.</li> <li>3. Complete a desktop palaeontological assessment / statement to determine the potential occurrence of fossils at the depth of the mineral resource and the potential associated risks.</li> <li>4. Complete a high-level heritage impact assessment based on the geological modelling and blasting assessment to determine the potential risk of subsidence and vibrations on the sensitive heritage resources and landscape.</li> </ol>

Comment	Response
<p>previous assessment on heritage resources on the affected properties. Rather that a section 32 amendment application process be undertaken. Therefore, the SAHRA objects to this proposed development and advises the Department of Mineral Resources and Energy (DMRE) to reject the amendment application for the extension of the Mining Right Area with the inclusion of two additional farms, namely Bonne Esperance 356 LR and Too Late 359 LR (LP30/5/1/2/2/10161MR) as the impact to heritage resources as required by section 24(4)b(iii) of NEMA and section 38(3) and 38(8) of the NHRA has not been conducted as part of the EA process.</p>	
<p>This comment must be forwarded directly to the competent authorities and proof of the submission and receipt thereof must be provided to SAHRA.</p>	<p>Your comments as well as this response will be submitted to DMRE for their consideration in terms of the current process. The above studies will in the meanwhile be undertaken until such time as direction has been received from DMRE on the way forward.</p>
<p>It should be noted that the Heritage Management Plan has not been submitted to SAHRA as per the EA granted to the mine under condition 8.</p>	<p>The HMP has been developed, and Waterberg is now commencing with the process of consulting with RARI before the HMP will be submitted to SAHRA for review and approval.</p>

#### 2.7.5.2 Public Participation Report

A Public Participation Report was compiled detailing the above process and providing proof of the various steps in the process. The report is attached as Appendix 5.



### 3. Environmental attributes and description of the baseline receiving environment

This section describes the baseline receiving environment of the proposed Extension Area. Information in this section is based on specialist studies undertaken in support of the original Mining Right application and studies conducted during a prefeasibility study, desktop studies and a site visit by the EAP as well as input from the public through the I&AP participation. As such, the descriptions below of environmental features represent a consolidation of relevant information to the application Extension Area.

#### 3.1 Conservation characteristics

##### 3.1.1 Limpopo Conservation Plan

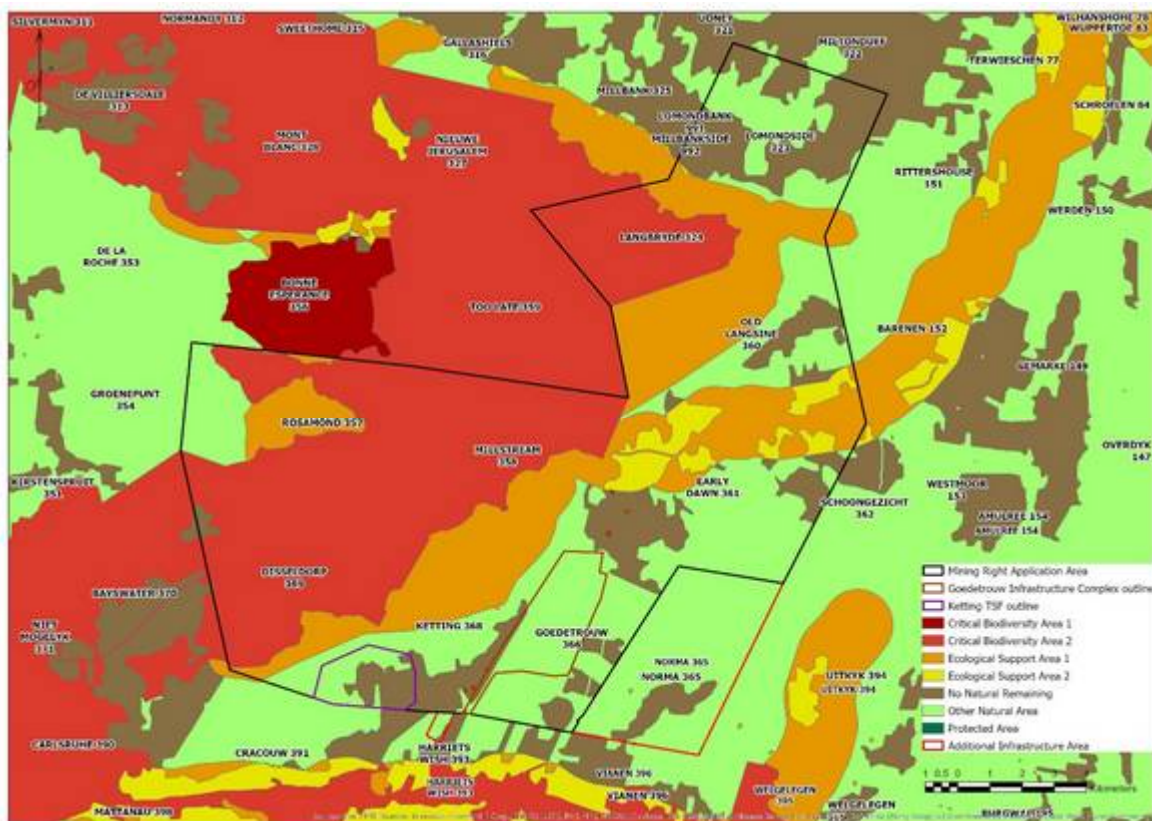


Figure 2: Limpopo Conservation Plan

The purpose of the Limpopo Conservation Plan ("LCP") is to develop the spatial component of a bioregional plan (i.e., map of Critical Biodiversity Areas and associated land-use guidelines).

Bioregional plans are one of a range of tools provided for in the Biodiversity Act that can be used to facilitate biodiversity conservation in priority areas outside the protected area network. The purpose of a bioregional plan is to inform land-use planning, environmental assessment and authorisations, and natural resource management, by a range of sectors whose policies and decisions impact on biodiversity.

This is done by providing a map of biodiversity priority areas or Critical Biodiversity Areas (CBA) together with accompanying land-use planning and decision-making guidelines. The conservation plan applies a target driven systematic spatial biodiversity planning methodology to develop this map and it is based on the best available

biodiversity and context data, and an explicit set of biodiversity conservation targets. The resultant map represents the minimum area necessary to maintain biodiversity pattern and ecological processes in the landscape, i.e., ecologically functional landscapes.

Bioregional plans are intended to feed into a range of multi-sectoral planning and assessment processes such as Environmental Management Frameworks (EMFs), Spatial Development Frameworks (SDFs), Strategic Environmental Assessments (SEAs), Environmental Impact Assessments (EIAs), Biosphere Reserves, and to support and streamline environmental decision-making. A bioregional plan is not in itself a multi-sectoral planning or assessment tool, but rather is the biodiversity sector's input into other planning and assessment processes.

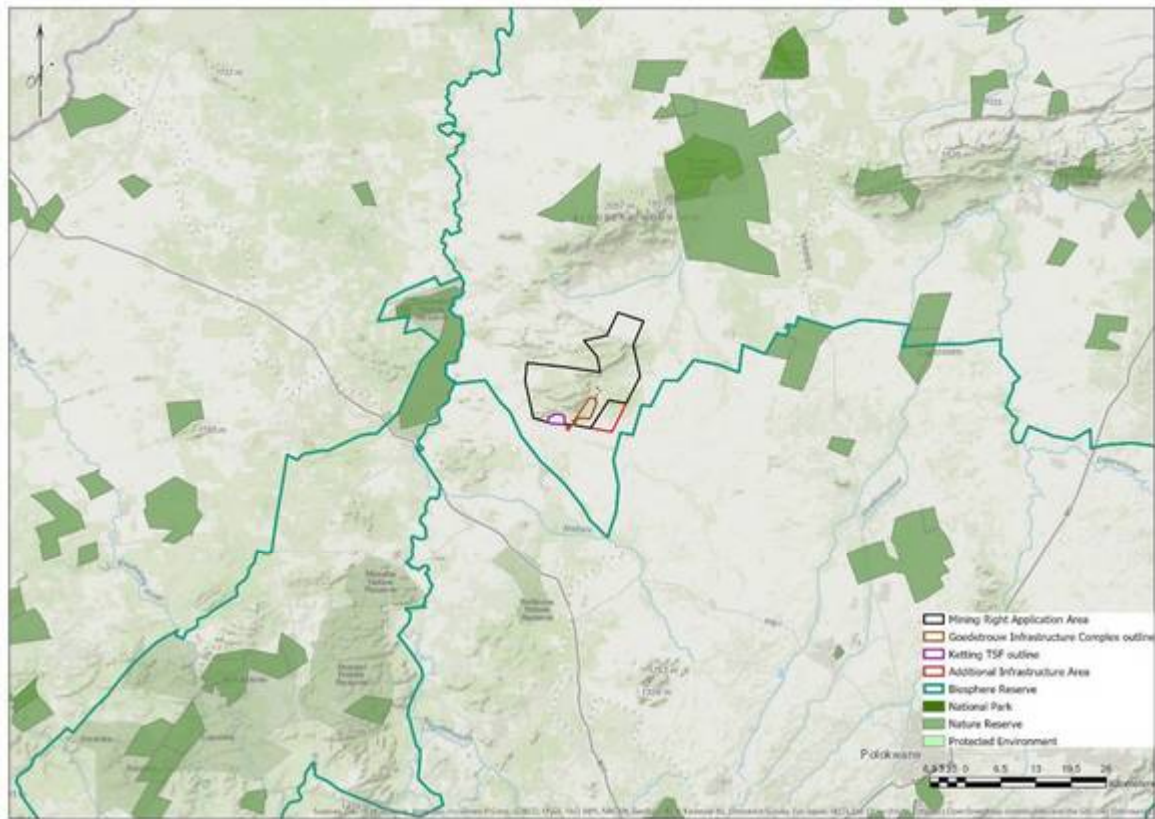
This conservation plan is consistent with NEMA principles and the Biodiversity Act. It is designed to support integrated development planning and sustainable development by identifying an efficient set of Critical Biodiversity Areas that are required to meet national and provincial biodiversity objectives, in a configuration that is least conflicting with other land uses and activities. Where alternatives are available, the Critical Biodiversity Areas are designed to avoid conflict with existing IDPs, EMFs and SDFs in the region by favouring the selection of sites that are least conflicting with other land-uses.

Although the proposed Extension Area encompasses a number of CBA1, CBA2 and Ecological Support Areas (ESA) 1&2, it is noted that no surface infrastructure or any surface disturbance is planned for the area.

### **3.1.2 Vhembe Biosphere Reserve ("VBR")**

The VBR covers five local municipal areas of the Limpopo Province. They are Blouberg, Musina, Makhado, Thulamela and Mutale. A portion of the Kruger National Park, north of the Shingwedzi River, is also included. The eastern border is formed by the Mogalakwena River and the southern border extends roughly from just south of the Blouberg – Makgabeng and Soutpansberg Mountain Ranges, across the Luvuvhu River catchment, to the east. The northern and eastern boundaries are formed by the international boundaries with Botswana, Zimbabwe and Mozambique.

The Mining Area is located within the VBR that spans more than 30 000 ha, proclaimed in 2009 (VBR 2018). The Mining Area forms part of the transitional range of the VBR with ESS indexes of 5-7 and 11-14 for the low lying areas and the Makgabeng Plateau respectively.

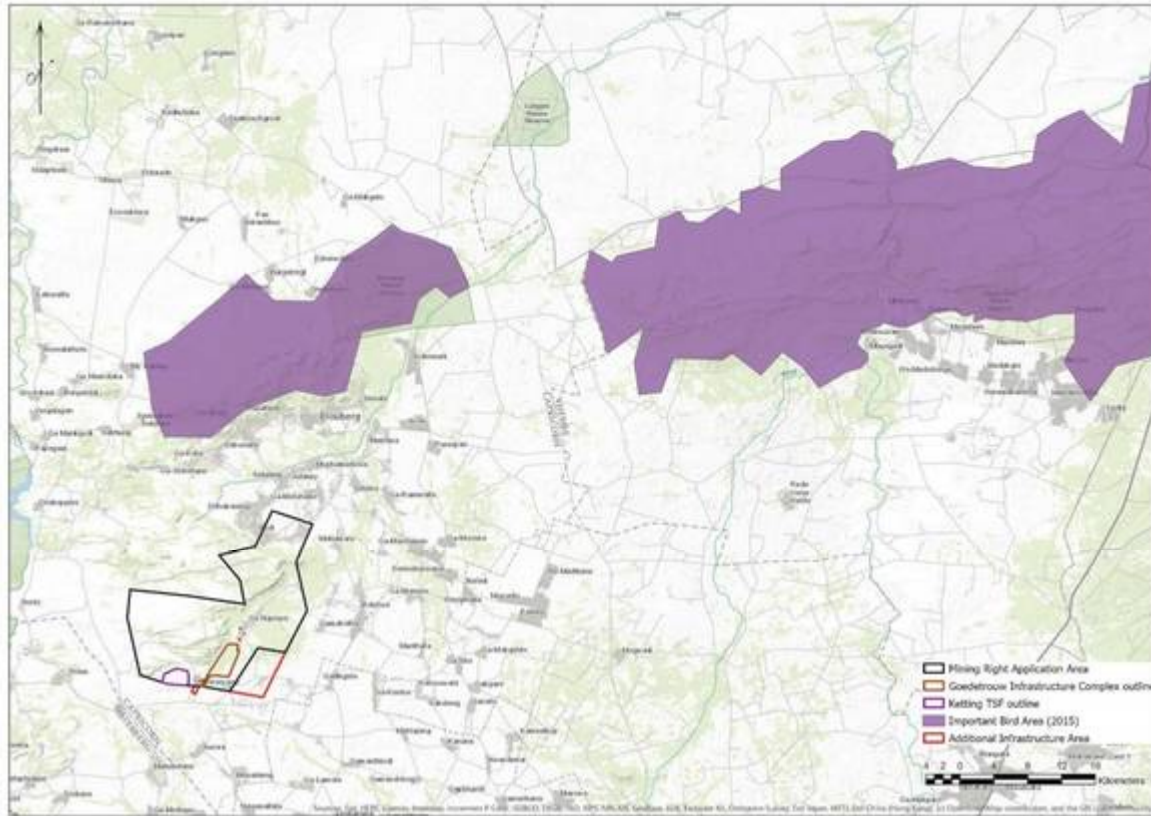


**Figure 3: Protected Areas and Vhembe Biosphere Reserve**

### 3.1.3 Important Bird Areas

The Important Bird Areas (“**IBA**”) Program is a global initiative co-ordinated by BirdLife International, of which BirdLife South Africa is the South African national partner. The program identifies clearly delineated areas of bird conservation concern based on a rigorous set of criteria based on the presence and abundance of Red Data and other relevant, e.g., endemic, restricted-range and congregatory, bird species. South Africa has 122 IBA's.

The Mining Area is located 13 km south of the global Blouberg IBA, a partially protected area of approximately 36 270 ha with the focus being the world's largest colony of Cape vultures *Gyps coprotheres* (Marnewick *et al.* 2015).



**Figure 4: Important Bird Areas**

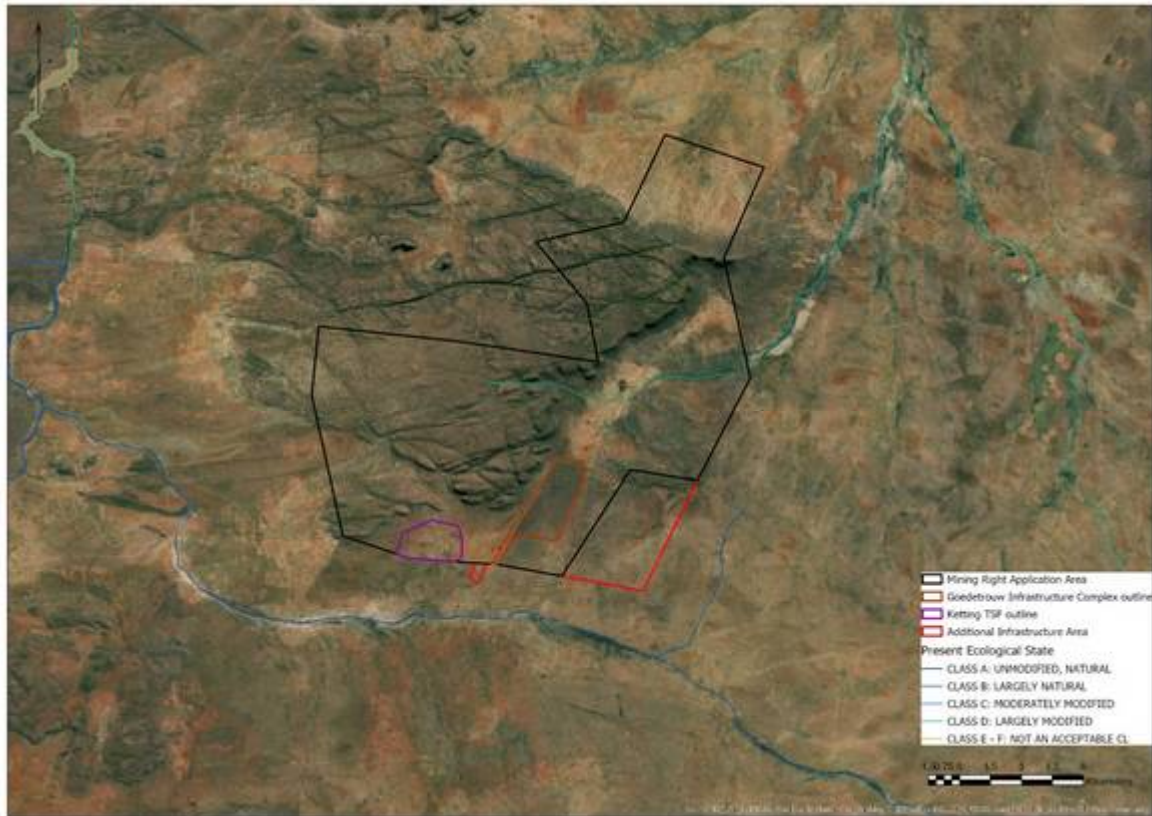
### 3.1.4 National Freshwater Ecosystem Priority Areas

The National Freshwater Ecosystem Priority Areas (NFEPA) project provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supports sustainable use of water resources. These priority areas are called Freshwater Ecosystem Priority Areas, or 'FEPAs'. FEPAs were identified based on:

- Representation of ecosystem types and flagship free-flowing rivers
- Maintenance of water supply areas in areas with high water yield
- Identification of connected ecosystems
- Representation of threatened and near-threatened fish species and associated migration corridors
- Preferential identification of FEPAs that overlapped with:
  - Any free-flowing river
  - Priority estuaries identified in the National Biodiversity Assessment 2011
  - Existing protected areas and focus areas for protected area expansion identified in the National Protected Area Expansion Strategy.

There are no NFEPA Rivers within the Mining Area or the proposed Extension Area.





**Figure 5: NFEPA Rivers**

## **3.2 Climate**

### **3.2.1 Regional Climate**

The Limpopo Province falls in the summer rainfall region, with the western part semi-arid and the eastern part largely sub-tropical. The western and far northern parts experience frequent droughts. Winter throughout the Limpopo Province is mild and mostly frost-free. The climatic conditions vary within the Limpopo WMA, which ranges from the Waterberg Mountains in the south, northwards to the hot, dry Limpopo River valley on the border with Zimbabwe and Botswana. The mean annual temperature ranges between 16°C in the south to more than 22°C in the north, with an average of 20°C for the catchment as a whole. Maximum temperatures are usually experienced in January and minimum temperatures occur on average in July.

### **3.2.2 Rainfall**

The largest portion of the Limpopo Province has a mean annual rainfall of between 300 and 500 mm. The south-western part has an annual rainfall of up to 700 mm and in the Lowveld the rainfall can exceed 1 000 mm a year in places.

The Blouberg LM, in which the Waterberg Project is located, is a hot area, with annual rainfall varying between 380 and 550mm. Most rainfall is experienced during the summer months.

During the rainy season a maximum of 8 to 12 rain days per month is typically expected, whilst in the dry season a maximum of 1 rain day may be expected per month. The rainfall is mainly in the form of thunderstorms. Hail, which is often associated with thunderstorms, does occur during the hot summer months.

In accordance with the rainfall patterns the relative humidity is higher in summer than in winter. Humidity is generally highest in February (the daily mean ranges from 64% in the west to above 70% in the east).

The average monthly precipitation is indicated in the table below:

**Table 4: Average monthly precipitation**

Precipitation (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly max	202	81	65	36	33	1	5	45	43	57	133	304	84
Monthly min	175	71	20	1	8	0	0	0	3	41	103	113	45
Monthly ave	186	75	18	19	18	0	2	18	20	49	115	185	59

### 3.2.3 Temperature

The average maximum, average and minimum temperatures for Mokopane are given in the table below. Annual average temperatures for the area are given as 18.3°C.

The average daily maximum temperatures range from 22.9°C in December to 8.1°C in July, with daily minima ranging from 21.5°C in December to 7.1°C in July. Annual average temperature for the Mining Area is given as 16.8°C.

**Table 5: Average maximum, average and minimum temperatures**

Temperature (°C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly max	23.5	22.3	21.6	18.8	16.0	13.0	10.7	14.1	18.8	20.6	22.0	23.3	18.7
Monthly min	21.9	20.9	20.3	17.5	15.0	11.1	10.3	13.3	17.2	19.5	21.1	22.2	17.5
Monthly ave	22.8	21.7	15.5	17.9	15.5	11.8	10.5	13.6	18.0	20.1	21.7	22.6	17.6

### 3.2.4 Wind

The predominant wind direction is from north-northwest, with the secondary component from the northwest and west northwest. Contributions from the north and northeast quadrant are observed. Wind speeds vary between 6 – 11 kilometres per hour.

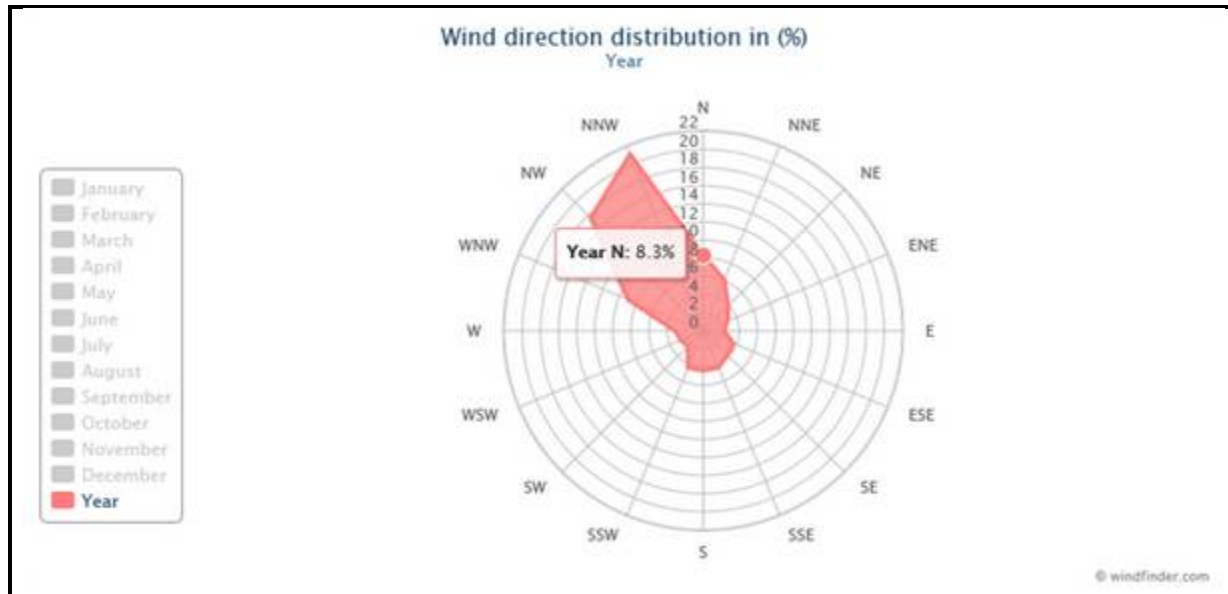


Figure 6: Wind direction distribution

### 3.2.5 Evaporation

As shown in the table below, the annual maximum, minimum and average monthly evaporation rates for the Potgietersrus (Mokopane) area for the period 1957-1987 are 244 mm, 130 mm and 178 mm, respectively. (Potgietersrus is the closest weather station that measures evaporation). It appears that this has also closed, hence the data being outdated.

The highest monthly maximum evaporation (322 mm) occurs for October. The rate decreases significantly down to 109 mm in June. The monthly minimum evaporation ranges between 180 mm in October and 68 mm in April.

Table 6: Annual maximum, minimum and average monthly evaporation

Evaporation (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly max	289	262	224	190	223	244	257	261	288	322	277	320	289
Monthly min	88	120	93	68	79	70	85	111	155	180	178	128	88
Monthly ave	206	177	171	141	124	109	126	170	224	253	224	212	206

### **3.2.6 Extreme weather conditions**

Thunderstorms occur frequently in summer and are usually accompanied by lightning, heavy rain, strong winds and occasional hail.

Periods of extreme heat during summer months occur frequently. This can be accompanied by drought conditions.

### **3.3 Topography and Landscape character**

The proposed Extension Area is situated in the mountainous area of the Makgabeng Plateau. These farms are very inhospitable with huge rock faces, steep slopes, deep valleys, outstanding rock formations, caves and rock overhangs and uneven rock surfaces (Figure 7 & 8)



**Figure 7: View of the mountain showing rock formations and steep slopes.**





**Figure 8: View of an uninhabited cave along a steep cliff in the mountain.**

### **3.3 Biodiversity**

The biodiversity section in this report is a combination of a comprehensive biodiversity assessment conducted during the initial Mining Right application and a biodiversity risk assessment conducted during the prefeasibility stage of the Waterberg Project.

#### **3.3.1 Flora**

From a regional perspective, the centre of the Mining Area is covered with a vulnerable vegetation type, namely Soutpansberg Mountain Bushveld; while the remaining area is covered mainly with least threatened Roodeberg Bushveld. The vulnerable Soutpansberg Mountain Bushveld extends mostly along the mountainous areas of the Extension Area. Most of the lower lying areas of the Mining Area are covered with least threatened Roodeberg Bushveld. The two vegetation types mentioned belongs to the Savannah Biome of South Africa and is summarised in Table 7.

**Table 7: Overview of the two regional vegetation types present within the core study area (Mucina & Rutherford 2006).**

<b>Vegetation Unit</b>	<b>Roodeberg Bushveld (Svcb 18)</b>	<b>Soutpansberg Mountain Bushveld SVcb 21)</b>
Vegetation & Landscape Features	Plains and slightly undulating plains, including some low hills, with short, closed woodland to tall open woodland and poorly	Low to high mountains, highest in the west, splitting into increasing number of lower mountain ridges towards the east. Dense tree layer and poorly developed grassy layer.

	developed grass layer. <i>Kirkia acuminata</i> trees not limited to hills	The topography of the east-west orientated ridges of the mountain changes drastically over short distances, resulting in orographic rain on the southern ridges, and a rain shadow effect on the northern ridges. Because of this topographic diversity, the Soutpansberg Mountain Bushveld comprises a complex mosaic of sharply contrasting kinds of vegetation within limited areas
Biogeographically Important Taxa	No	Yes - 4 species
Endemic Taxa	No	Yes – 12 species
Conservation status	Least threatened. Target 19%. Almost 6% statutorily conserved, mainly in the Wonderkop and Blouberg (Malebocho) Nature Reserves. An additional 3% conserved in other reserves, mainly in areas adjacent to the Wonderkop Nature Reserve. About 18% transformed	Vulnerable. Target 24%. Just over 2% statutorily conserved in the Blouberg, Happy Rest and Nwanedi Nature Reserves. A smaller area is conserved in other reserves.
Transformation level	About 18% transformed, mainly by cultivation, with very little urban and built-up areas. Erosion is low to high	21% transformed, with about 14% cultivated and 6% plantations. High rural human population densities in some of the lower lying parts of the eastern section of the unit. Erosion is very low to moderate
Utilisation	The area is mostly used for game ranching	None specified

It is expected that the extreme topographic diversity and altitude changes over short distances within the Mining and Extension Areas result in various microclimates which support high levels of plant diversity.

### ***Roodeberg Bushveld (SVcb 18)***

This vegetation type straddles the Tropic of Capricorn, at an altitude of approximately 850 – 1100 metres above sea level (masl). The vegetation occurs on slightly undulating plains, including some low hills, and comprised of short, shrubby bushveld with a poorly developed grass layer. The area is transitional between the higher lying Polokwane Plateau and the lower lying vegetation units of the Limpopo River Valley. This vegetation type occurs on slightly undulating plains and low hills, with short, closed woodland to tall open woodland with a poorly developed grass layer.

Rainfall occurs in summer with very dry winters. Mean annual rainfall is about 400 – 550mm. This vegetation type is regarded to be vulnerable. This is due to the south-western half of the unit being densely populated with rural communities. This vegetation type is not regarded to be threatened.

### ***Soutpansberg Mountain Bushveld (SVcb 21)***

This vegetation type occurs on the slopes of the Blouberg Mountain, extending from an altitude of 600-1500 masl. There is a dense tree layer and poorly developed grass layer. The topography of the area changes drastically resulting in orographic rain on the southern ridges and rain shadow effect on the northern ridges. Because of this topographic diversity, the Soutpansberg Mountain bushveld comprises of a complex mosaic of sharply contrasting kinds of vegetation within limited areas. The main vegetation variations within the Soutpansberg Mountain Bushveld are subtropical moist thickets (mainly along the lower lying slopes), mist belt bush clumps, open savannah sandveld, and arid bushveld.

A high number of endemic and important taxa occur within this vegetation type; *Aloe vossi*, *Huernia whitesloaneaena*, *Orbea conjuncta*, *Stapelia clavicorona*, *Combretum vendae*, *Vangueria soutpansberensis*, *Blepharis spinipes*, *Dicoma Montana*, *Justicia montis-salinarum*, *Tylophora coddii*, *Kalachoe crundallii*, *Ipomea bisavium*, *Panicum dewinteri*, *Streptocarpus caeruleus*, *Aloe swynnertonii*, *Huernia nouhuysii*. This vegetation type is regarded to be Vulnerable due to high rural densities resulting in transformation and erosion.

## **3.3.2 Fauna**

Biological diversity everywhere is at great risk as a direct result of an ever-expanding human population and its associated needs for energy, water, food and minerals. Landscape transformation needed to accommodate these activities inevitably leads to habitat loss and habitat fragmentation, resulting in the mosaic appearance of undisturbed habitat within a matrix of transformed areas. Remaining areas of natural habitat are frequently too small to support the biodiversity that previously occupied these areas, consequently the area and the region is constantly losing its ecological integrity and diversity (Kamffer, 2004). The savannas of the Limpopo Province are no exception, and the presence of minerals has led to significant transformation, degradation and fragmentation of the region's grasslands. Agriculture and pastoral activities have had a significant impact on the biodiversity of the region – farming is believed by some to be the most damaging sector of human activity affecting wild nature.

### **3.3.2.1 Terrestrial mammals**

The terrestrial mammal surveys (initial Mining Right application stage) culminated in the identification of 36 species from the expected 86 species potentially present in the area. Analysis was based 28 species identified from track transects, 15 species from camera traps and 8 species using Sherman traps. The low rodent species diversity (18 rodent species not encountered but expected) can be attributed to inactivity and torpor during the survey period.

Although none of these species were classified as endemics, the leopard (*Panthera pardus*) (VU) is under threat and population numbers are decreasing nationally (Table8). The brown hyena *Parahyaena brunnea* (NT), although maintaining population numbers, is also increasingly under threat due to increased human encroachment and associated habitat destruction. Furthermore, six other animal populations are steadily decreasing i.e., African wild cat *Felis silvestris*, water mongoose *Atilax paludinosus*, Cape hare *Lepus capensis*, scrub hare *Lepus saxatilis*, honey badger *Mellivora capensis* and common warthog *Phacochoerus africanus*, due

to habitat loss. Population trends for caracal, Jameson's rock rabbit *Pronolagus randensis*, aardvark *Orycteropus afer*, springhare *Pedetes capensis* and the lesser red shrew *Crocidura hirta* are unknown and further studies will be required to determine national viability of these populations. The population trends for all other terrestrial mammal populations (24 species) encountered in the Mining Area are considered stable.

**Table 8: IUCN Red List of mammals observed in the area.**

Family	Scientific name	Common name	Red list status	Population trend	Endemism
BOVINDAE	Oreotragus	Klipspringer	LC	Stable	No
BOVINDAE	Raphicerus campestris	Steenbok	LC	Stable	No
BOVINDAE	Sylvicapra grimmia	Bush duiker	LC	Stable	No
BOVINDAE	Tragelaphus strepsiceros	Greater kudu	LC	Stable	No
CANIDAE	Canis mesomelas	Black-backed jackal	LC	Stable	No
CERCOPITHECIDAE	Chlorocebus pygerythrus	Vervet monkey	LC	Stable	No
CERCOPITHECIDAE	Papio ursinus	Chacma baboon	LC	Stable	No
FELIDAE	Caracal	Caracal	LC	Unknown	No
FELIDAE	Felis silvestris	African wild cat	LC	Decreasing	No
FELIDAE	Panthera pardus	Leopard	VU	Decreasing	No
GALAGONIDAE	Galago moholi	Southern lesser galago	LC	Stable	No
HERPESTIDAE	Atilax paludinosus	Water mongoose	LC	Decreasing	No
HERPESTIDAE	Cynictis penicillata	Yellow mongoose	LC	Stable	No
HERPESTIDAE	Herpestes sanguinea	Slender mongoose	LC	Stable	No
HERPESTIDAE	Mungos mungo	Banded mongoose	LC	Stable	No
HYAENIDAE	Parahyaena brunnea	Brown hyena	NT	Stable	No
HYSTRICIDAE	Hystrix africaeaustralis	Porcupine	LC	Stable	No
LEPORIDAE	Lepus capensis	Cape hare	LC	Decreasing	No
LEPORIDAE	Lepus saxatilis	Scrub hare	LC	Decreasing	No
LEPORIDAE	Pronolagus randensis	Jameson's red rock rabbit	LC	Unknown	No
MACROSCOLIDAE	Elephantulus myurus	Eastern rock sengi	LC	Stable	No

Family	Scientific name	Common name	Red list status	Population trend	Endemism
MURIDAE	<i>Acomys spinosissimus</i>	Southern spiny mouse	LC	Stable	No
MURIDAE	<i>Aethomys namaquensis</i>	Namaqua veld rat	LC	Stable	No
MURIDAE	<i>Gerbilliscus leucogaster</i>	Bushveld gerbil	LC	Stable	No
MURIDAE	<i>Mastomys coucha</i>	Southern African multi-mammate mouse	LC	Stable	No
MURIDAE	<i>Mus minutoides</i>	Tiny pigmy mouse	LC	Stable	No
MURIDAE	<i>Saccostomus campestris</i>	Cape pouched mouse	LC	Stable	No
MUSTELIDAE	<i>Mellivora capensis</i>	Honey badger	LC	Decreasing	No
NESOMYIDAE	<i>Cricetomys ansorgei</i>	Southern giant pouched rat	LC	Stable	No
ORYCTEROPODIDAE	<i>Orycteropus afer</i>	Aardvark	LC	Unknown	No
PEDETIDAE	<i>Pedetes capensis</i>	Spring hare	LC	Unknown	No
PROCAVIDAE	<i>Procavia capensis</i>	Rock hyrax	LC	Stable	No
SCIURIDAE	<i>Paraxerus cepapi</i>	Smith's bush squirrel	LC	Stable	No
SORICIDAE	<i>Crocidura hirta</i>	Lesser red shrew	LC	Unknown	No
SUIDAE	<i>Phacochoerus africanus</i>	Common warthog	LC	Decreasing	No
VIVERRIDAE	<i>Genetta</i>	Small spotted genet	LC	Stable	No

### 3.3.2.2 Avifauna

The Mining Area is expected to support approximately 271 bird species according to available habitat types. Of these, 218 species (including 204 confirmed during the wet season of April 2019 and 153 species during the dry season of June 2018) were confirmed during the dry and wet season surveys, including five threatened and one near threatened species.

The white-backed vulture *Gyps africanus*, the globally endangered (EN) Cape vulture *Gyps coprotheres*, the regionally vulnerable (V) lanner falcon *Falco biarmicus*, the vulnerable (V) Verreaux's eagle *Aquila verreauxii* and the regionally near threatened (NT) short-clawed lark *Certhilauda chuana* are confirmed as present in the Mining

Area. However, species diversity can be expected to be substantially higher if the proximity of the Blouberg Nature Reserve (IBA) is considered. Furthermore, only an 81% observation success was calculated for the survey period, accentuating the need for additional surveys to be conducted during known higher activity periods.

The Mining Area is located 13 km south of the global Blouberg IBA, a partially protected area of approximately 36 270 ha, with the focus being the world's largest colony of Cape vultures *Gyps coprotheres* (Marnewick et al. 2015). It is also the only locality in South Africa where Rüppell's vulture *Gyps rueppellii* is regularly observed. The IBA provides breeding habitat for 900 to 1000 pairs of Cape vultures, which are also regularly observed foraging over the Mining Area. Small satellite breeding colonies of Cape vultures also used to breed in past at some of the nearby farms (Millbank, Leipsig and Glenferness) but these no longer exists. The following biome-restricted globally threatened (Table9) and nationally threatened (Table10) bird species also occur at the Blouberg IBA. Some of the bird species were also recorded on the Mining Area i.e., southern pied babbler *Turdoides bicolor*, Kalahari scrub robin *Cercotrichas paena*, white-throated robin-chat *Cossypha humeralis*, barred wren-warbler *Calamonastes fasciolatus* and gorgeous bush-shrike *Telophorus viridis*.

**Table 9: Globally threatened / Near Threatened bird species (IUCN 2017) at the Blouberg IBA.**

Scientific name	Common name	Status	Approx # of breeding pairs	Mean Total Nr (Max)
<i>Gyps coprotheres</i>	Cape vulture	Endangered	900-1000*	1700-1900**
<i>Gyps africanus</i>	White-backed vulture	Critically endangered		OV
<i>Polemaetus bellicosus</i>	Martial eagle	Vulnerable	1-2**	3-4**
<i>Bucorvus leadbeateri</i>	Southern Ground-hornbill	Vulnerable	2-3**	10-20**

\* - Numbers derived from Marnewick et al. (2015).

\*\* - Numbers derived from Barnes (1998).

OV - occasional visitor

**Table 10: Nationally threatened / Near Threatened bird species (Taylor et al. 2015) at the Blouberg IBA**

Scientific name	Common name	Status	Approx # of breeding pairs	Mean Total Nr (Max)
<i>Ciconia nigra</i>	Black stork	Vulnerable	-	2-3**

\*\* - Numbers derived from Barnes (1998).

The studies mentioned provided an overview of the threatened and near threatened bird species that could occur in or near the Extension Area based on their respective distribution ranges and the presence of suitable habitat. At least 12 species are known to occur in the region, of which five species were confirmed during the survey (these are considered as residents and / or regular foraging visitors). Nine of the 12 species are threatened and three are near-threatened. Other noteworthy species confirmed from the Mining Area include the globally Critically

Endangered (CR) white-backed vulture *Gyps africanus*, the globally endangered (EN) Cape vulture *Gyps coprotheres*, regionally vulnerable (V) lanner falcon *Falco biarmicus*, vulnerable (V) Verreaux's eagle *Aquila verreauxii* and regionally near threatened (NT) short-clawed lark *Certhilauda chuana*.

Verreaux's eagle *Aquila verreauxii*, lanner falcon *Falco biarmicus* and short-clawed lark *Certhilauda chuana* are suspected to be resident on the Mining Area, with two vulture species considered as regular foraging visitors to the Mining Area. The high frequency of occurrence of these species is supported by high SABAP2 reporting rates, especially for lanner falcons (c. 40%) and Cape vultures (c. 70%).

Another two of the species i.e., secretary bird *Sagittarius serpentarius* and black stork *Ciconia nigra* could be present due to the occurrence of potential foraging and roosting habitat. The black stork has been recorded from the area (sensu SABAP2) and is regarded as an occasional visitor to the Mining Area. The storks are probably foraging individuals from the neighbouring Blouberg IBA. However, the steep south- and east- facing cliffs of the escarpment and rock faces provide optimal roosting and even breeding habitat for black storks. The Mining Area also provides extensive foraging habitat for secretary birds, especially the *Burkea africana* - *Combretum molle* - *Grewia flavescens* open woodland on the lower lying, gentle north-west facing slopes. However, it is seemingly absent from the area even though suitable habitat exists, with a plausible explanation for the absence of this species being the disturbances caused by livestock and anthropogenic activities in the area. However, this assumption requires further investigation, since the absence of black stork could also be due to seasonality. The remaining five species are regarded as uncommon, irregular foraging visitors or rare residents (e.g., Kori bustard *Ardeotis kori*) to the Mining Area.

#### **3.3.2.3 Invertebrates**

Invertebrates contributed 2049 species, including 79 morphospecies from 46 families, 42 dung beetles from the expected 60 species, five scorpion species, one species of baboon spider and 45 butterfly species. Although no threatened species are expected, this large taxon is poorly studied and dynamic in nature with new species frequently discovered.

The bat surveys culminated in the identification of ten confirmed species from the expected 26 species potentially present in the Mining Area. Although no Red List species were encountered, the presence of the Near Threatened (NT) Smither's horseshoe bat *Rhinolophus smithersi* and peak-saddle horseshoe bat *Rhinolophus blasii* are confirmed. If suitable habitat attributes are considered, at least 16 bat species could potentially be present in the Mining Area.

#### **3.3.2.4 Herpetofauna**

##### *Reptiles*

The herpetofauna surveys culminated in the identification of 43 reptile species consisting of 28 lizards, 15 snakes and one chelonian. From the expected 78 reptilian species present in the Mining Area, 11 reptiles are classified as South African endemics, with seven species being classified as Limpopo endemics. However, only the presence of the orange-throated flat lizard *Platysaurus monotropis* (EN) is confirmed as present in the area.

In a South African context, the Extension Area falls in a region with a recorded level of reptile endemism that scores moderate to high. The Makgabeng area and several other significant geological features in the general region (e.g., Blouberg, Soutpansberg and Waterberg) are renowned for relatively high levels of reptile endemism. At least 11 South African reptile endemics and seven Limpopo Province reptile endemics are likely to occur within the Mining Area, with orange-throated flat lizard *Platysaurus monotropis* being endemic to the CDM area.

### *Amphibians*

The frog survey culminated in the identification of seven frog species from 17 species potentially present in the area. However, no threatened or endemic species are known to be present in the area.

In contrast to the relatively high level of reptile endemism in this region, the level of endemism for amphibians is Low. In fact, none of the 16 frog species that can potentially occur within the Mining Area are South African endemics. The only frog endemic in the general region (e.g., Soutpansberg) is northern forest rain frog *Breviceps sylvestris*.

**Table 11: Herpetofaunal survey representativeness in the Project Area**

Family	Recorded richness	Potential richness	Survey richness (%)
Chelonians	1	4	25
Lizards	28	38	74
Snakes	15	36	42
Reptiles	44	78	56
Amphibians	7	17	41

## **3.4 Soils, Land use and Land capability**

### **3.4.1 Land type data**

The dominant land types in the proposed Extension Area are Ae334 and Ib445. They are described in detail below.

#### *Land Type Ae334, Ae335*

- Land Type – General: Ae land types denote landscapes where the dominant soils are deep, red and eutrophic (high base status).
- Soils: Soils are red coloured, eutrophic, sandy and well-drained in predominantly level terrain. Soils in valley bottom positions grade to yellow and with increased clay content soils occurring in areas. Soils in drainage depressions show signs of incipient soil formation and may contain lime. Distinct signs of hydromorphism are generally lacking due to the masking effect of increased lime content in the lower lying soils.
- Land capability and land use: The land use in the general land type area is predominantly dryland subsistence agriculture and extensive grazing. The land capability mimics the land use.



- Agricultural potential: The agricultural potential is low due to low and erratic rainfall that is in the region of 400 mm pa. Commercial scale dryland crop production is considered viable only from 500 mm pa and up.

#### *Land Type Ib445*

- Land Type – General: Ib land types denote landscapes dominated by rock outcrops (60 – 80 %) with some deeper soil areas interspersed in between.
- Soils: Soils are dominantly shallow and rocky with deeper red and yellow sandy soils interspersed sporadically in between.
- Land capability and land use: The land use in the general land type area is predominantly grazing and wilderness due to soil depth limitations. The land capability mimics the land use.
- Agricultural potential: The agricultural potential is Low.

### **3.4.2 Soil types**

Soil in the area are dominated by a variety of shallow soil types. This is attributed to the extremely rocky and mountainous terrain of the proposed Extension Area. Some patches of deeper red and yellow shallow Hutton and Clovelly soils do occur. These are however limited to lower lying areas close to drainage lines.

### **3.4.3 Land Use and Land Capability**

The current land use in the proposed Extension Area is extensively wilderness and grazing by cattle and goats. This land use is the most suitable in the area, due to the relatively low and erratic rainfall that limits other agricultural uses such as crop production. Consequently, the land capability will mimic the land use and is therefore classified as “grazing”. The DFFE land capability rating for the site is VII (Table12).

**Table 12: Land capability classes for assessment of land**

<b>Land capability class</b>	<b>Definition</b>	<b>Conservation need</b>	<b>Use suitability</b>
VII	Very severe limitations. Suitable only for natural vegetation.	Adequate management for natural vegetation.	Natural veld grazing and afforestation

### **3.4.4 Agricultural Potential**

Due to the severe limitations in terms of rainfall, no crop production can be conducted on the site commercially. The only agricultural activity that can be conducted on the area is extensive grazing.

The carrying capacity of the site was not determined but this parameter will vary according to the rainfall variation and management practices. In the specific area the grazing capacity can vary between 1 large stock unit per 10 ha to 15 ha depending on the rainfall of the specific season. Due to the erratic nature of the rainfall overgrazing during dry spells is a distinct risk.

#### **3.4.5 Wetland Presence**

No wetlands were encountered on the Extension Area.

### **3.5 Surface water**

The proposed Extension Area is located within the Limpopo Water Management Area (WMA 01) and is located in quaternary catchment A62J. The Glen Alpine Dam is situated within this catchment.

There are several streams draining the entire Waterberg Project boundary which form part of the Limpopo River Basin. These rivers flow towards the Limpopo River which marks the boundary of South Africa and Botswana.

The rivers draining the Mining Area are described below:

- The Mogalakwena River flows along the Western boundary of the Mining Area in a Northern direction towards the Limpopo River. There is dam on the Mogalakwena River namely the Glen Alpine Dam;
- The Natse/ Seepabana River drains the southern part of the Mining Area in an Easterly to Westerly direction towards the Mogalakwena River;
- The Gamamoleka River drains the Northern part of the Mining Area, downstream outside the project boundaries towards the Mogalakwena River;
- The Bosehla River drains inside the Mining Area in a North Westerly direction and forms a confluence with the Kubu River (flowing in a South-Eastern direction) about 5 km South of Blouberg;
- The Tswatsane River flows along the Eastern side outside the Mining Area from South to North in a direction where the Kubu and Boshela Rivers drain; and
- The Brakrivier drains the North-Western side, outside the Mining Area and is fed by the Tswatsane, Boshela and Kubu Rivers.



Figure 9: Surface water catchments.

### 3.5.1 Surface Water Quantity/Hydrology

The surface water attributes of the quaternary catchment namely Mean Annual Runoff (MAR), Mean Annual Precipitation (MAP) and Mean Annual Evaporation (MAR) were obtained from the Water Research Commission (WRC) Report No.TT 380/08 (WRC, 2005) as indicated in Table 13. The area is characterised by relatively low proportion of MAP that is converted to runoff. The conversion of MAP to MAR in the four catchments ranges between 1.03 and 1.53%. This indicates that there is a scarcity of surface water within the area as is consistent with the characteristics of the Limpopo WMA.

**Table 13: Summary of the surface water attributes of the quaternary catchments.**

Catchment	Area (km <sup>2</sup> )	MAP (mm)	MAR (mm)	MAR (m <sup>3</sup> *10 <sup>6</sup> )	MAE (mm)	% MAE of MAP
A62J	930	450	6.09	5.66	1 950	1.35

There is no surface water use in the Mining Area and its immediate surrounds. The water use in this area is supplied from groundwater via boreholes.

### 3.5.2 Surface water quality

Water quality sampling cannot be done as part of the surface water assessment for the Extension Area. Due to the arid nature of the area, streams and the rivers are mostly dry and surface flow only occurs after significant downpours. The surface water run-off accumulated during such events does however not represent the true surface water quality because the river only flows over a short distance, whereafter it seeps into the deep sands.

## 3.6 Groundwater

### 3.6.1 Aquifer type

The geology of the area is predominantly from the Swazian era, consisting of Alldays gneiss, with portions of Mount Dowe Quartzite and Messina Anorthosite, Serpentinite and Pyroxinite. The lithology is described as undifferentiated rocks of various mixed lithologies, predominantly meta-arenaceous rocks. Groundwater occurs in the intergranular and fractured rocks.

### 3.6.2 Groundwater levels

Regionally, the water table of the BLM ranges between 5 – 20 m below ground level and groundwater flow is generally in a westerly direction, at a velocity of less than 1 m/day.

The numerous fault zones in the area act as preferential flow paths for groundwater.

### 3.6.3 Groundwater Recharge

The estimated recharge is between 6.2 (mm/a) and 10.1 (mm/a).

#### **3.6.4 Borehole Yields**

Borehole yields range between 0.5 – 2.0 l/s. The mean borehole yield in the area is 1.0l/s.

#### **3.6.5 Groundwater Use**

Groundwater is the primary source of water in the area and local communities are dependent on it for domestic purposes, including drinking, cooking and bathing, stock watering and small-scale irrigation. Water is abstracted from boreholes situated in the villages.

#### **3.6.6 Groundwater Quality**

The general water quality in the Extension Area is marginal to poor with mean Total Dissolved Solids (TDS) of 843.8 mg/l. The high salt content reduces water quality, in terms of the South African National Standards (SANS) drinking water quality guidelines, to Class 2 due to elevated chloride, sodium and fluoride. In some cases, elevated magnesium and nitrates reduce the quality further (Class 3). Water quality is influenced by the underlying geology and the impact of human activities in the surrounding communities.

### **3.7 Air Quality**

#### **3.7.1 Regional air quality**

South Africa is located in the sub-tropics, where high pressures and subsidence dominate. However, the southern part of the continent can serve as a source of hot air that intrudes sub-tropics, and that sometimes lead to convective movement of air masses. On average, a low pressure will develop over the southern part of the continent, while the normal high pressures will remain over the surrounding oceans. These high pressures are known as Indian high-pressure cells and Atlantic high-pressure cells. The intrusion of continents will allow for the development of circulation patterns that draw moisture (rain) from either tropics (hot air masses over equator) or from the mid-latitude and temperate latitudes.

Southern Africa is influenced by two major high-pressure cells, in addition to various circulation systems prevailing in the adjacent tropical and temperate latitudes. The mean circulation of the atmosphere over Southern Africa is anticyclonic throughout the year (except near the surface) due to the dominance of the three high pressure cells, namely the: South Atlantic High Pressure, off the west coast; South Indian High Pressure off the east coast and Continental High Pressure over the interior.

It is these climatic conditions and circulation movements that are responsible for the distribution and dispersion of air pollutants within the Mining Area and between neighbouring provinces and countries bordering South Africa.

#### **3.7.2 Summary of ambient air quality**

Ambient air quality monitoring has not been implemented at the proposed Extension Area, and no historical reliable local or district municipal Ambient Air Quality Monitoring Stations (AQMS) is in close vicinity to the enterprise. The DEA is however operating two AQMS in the Greater Limpopo region.

The Mokopane AQMS forms part of the Waterberg/Bojanala priority area and is approximately 100 km from the proposed Extension Area, whilst the Lephalale AQMS is approximately 120 km from the proposed Extension Area. The data quality of both these AQMS is unknown.

### **3.8 Noise**

The proposed Extension Area may be described as a rural district, interspersed with typical African rural villages. In the absence of any nearby mining activities and with little traffic on the nearest public roads, ambient noise levels are still relatively low.

Inside villages ambient levels are bound to be elevated above the residual level by community activity and local traffic noises. In small rural villages, the level rises to typically 50 dBA (daytime) and 40 dBA (night-time), which corresponds to the SANS 10103 category Suburban Districts with little road traffic. With growing population density and commercial activities, the corresponding levels eventually rise to typically 55 dBA and 45 dBA in rural towns, which correspond to the nominal ratings for Urban Districts.

In an area covered with dense vegetation, thriving with insect, bird and amphibian life, the residual ambient noise floor seldom drops below 35 dBA and could well exceed that level, especially at night. Contrary to the characteristic pattern in developed and populated urban areas where, in response to traffic flow patterns, the night-time ambient noise level is characteristically 10 dB lower than the corresponding daytime level, it is not uncommon in remote rural or wilderness areas for the daytime level to be the same as, or even lower than, the night-time level. This is the reason why the lowest ambient noise category in SANS 10103 is assigned a night-time rating of 35 dBA, with a corresponding daytime level of 45 dBA.

The level of ambient noise in any area, whether purely residual, or elevated by intrusive noise, is bound to fluctuate perpetually. Although a rating has to be assigned for purposes of assessment, the actual measured level in any area will never be constant. Hence, in an area rated at 35 dBA for example, the actual level will from one day to the next, characteristically vary by several decibels around this value, even during the course of a single night.

### **3.9 Social aspects**

The section is extracted from the original EIA compiled during the Mining Right application.

#### **3.9.1 Blouberg Local Municipality**

The Blouberg Local Municipality (BLM), in which the Waterberg Extension Project is located, is part of the Capricorn District Municipality (CDM) of the Limpopo Province, bordering Zimbabwe and Botswana. At 9 540 km<sup>2</sup> it is the largest of four municipalities in the district, making up almost half of its geographical area (<https://municipalities.co.za/>; StatsSA, Census 2011). The CDM is predominantly rural and has the third-largest district economy in the Limpopo Province (<https://municipalities.co.za/>).

Half of the population of CDM resides in Polokwane Municipality, followed by Lepelle-Nkumpi, Blouberg, Aganang and Molemole with 18%, 13%, 10% and 9% respectively (CDM Final IDP/Budget 2016/17-2020/21). In August

2016 Aganang LM was de-established and amalgamated with Blouberg, Polokwane and Molemole, affecting this distribution slightly.

Roads R521 (P94/1 and P94/2) provide a north-south link between Blouberg and Molemole, Polokwane and the Makhado Municipalities. To the east the BLM is served by road R523 (D1200), which provides access to towns such as Mogwadi, Morebeng, Duiwelskloof, Tzaneen and Lephalale. The N11, which passes from Mokopane town to Botswana through the Blouberg LM, has the potential to stimulate the economy (Draft Blouberg LM IDP/Budget 2018/2019-2021). CDM has an international airport and is linked to Gauteng by the N1 freeway.

There are a number of rivers and tributaries in the BLM, which are used for agricultural purposes and various mountain ranges and heritage sites attract tourists. The BLM is home to some of the most spectacular rock-climbing locations in South Africa.

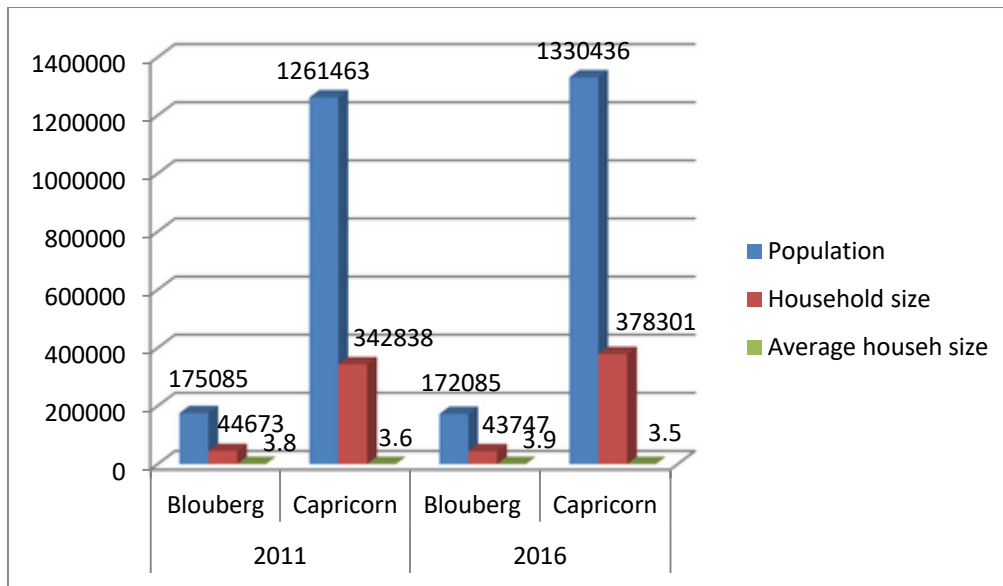
The major economic sectors are agriculture, mining and tourism. The BLM experiences challenges in the area of high levels of unemployment and high illiteracy rate. Most areas are not suitable for development. There is a huge infrastructure backlog in terms of water, roads, sanitation, education, health and recreational facilities (CDM Final IDP/Budget 2016/7-2020/21).

Currently the BLM consists of 25 wards and, prior to its amalgamation with a section of Aganang LM in 2016, consisted of 125 villages. The Waterberg Mining Area mainly affects wards 1 and 2.

### **3.9.2 Key demographic information**

#### ***Population statistics***

The 2016 Community Survey (CS) estimated the total CDM population at 1 330 436. CDM had a population increase of 0.8% between 2001 and 2011 (with the largest growth in Polokwane Local Municipality of 2.13%) and then again with 1.21% per annum since 2011 up to 2016 (StatsSA). The average household size decreased slightly from 3.6 to 3.5 between 2011 and 2016.



**Figure 10: Population statistics of the Project Area.**

### ***Unemployment Estimate for the Area***

The total BLM population is estimated at 172 601 (2016), with an average household size of 3.9 (StatsSA). In contrast to the CDM, the BLM revealed a negative population growth per annum of -0.32% between 2011 and 2016. This trend could most likely be attributed to a migration of people to urban areas looking for employment and improved service delivery (education and so forth) and, according to StatsSA, a large percentage people moved away to be closer to their spouses (marriage).

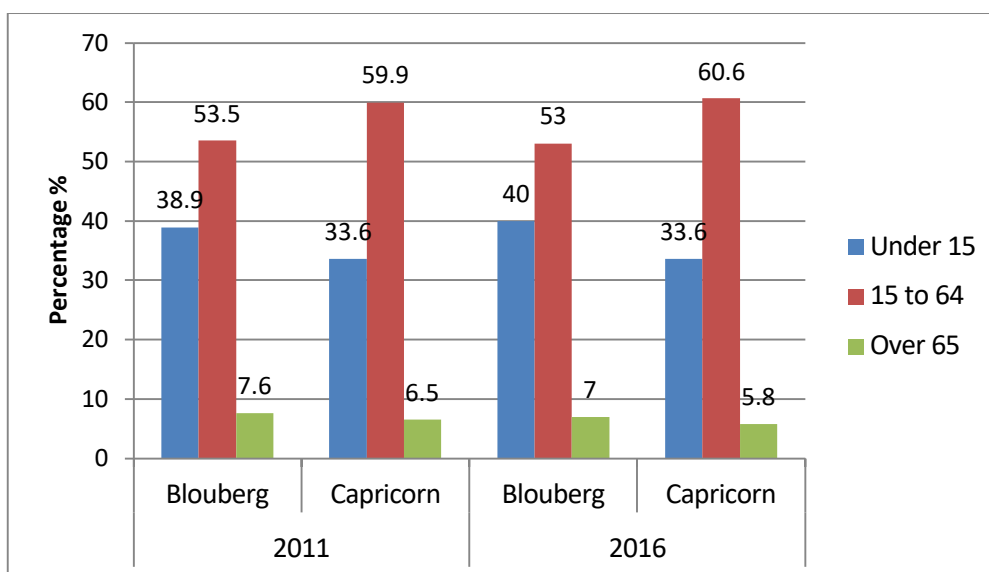
### ***Age and gender***

The age and gender structure of the population is a key determinant of population change and dynamics. The shape of the age distribution is an indication of both current and future needs regarding educational provision for younger children, health care for the whole population and vulnerable groups such as the elderly and children, employment opportunities for those in the economic age groups, and provision of social security services such as pension and assistance to those in need.

The age and sex structure of smaller geographic areas are even more important to understand, given the sensitivity of small areas to patterns of population dynamics such as migration and fertility. An increase in the young and economically active population of a municipality would thus mean the potential increase in income earnings, however the growth would place pressure on educational resources and job opportunities as there is the possibility for smaller and slower growing economies to provide work to the increasing population.

The predominant gender in the CDM and BLM is female, with an average of 53.2% females in the CDM and 54% in the BLM.





**Figure 11: Age structure of CDM and BLM (Source: StatsSA)**

The age structure in the CDM and BLM has remained fairly constant since 2011, although there has been a slight increase in the number of young people (0-4 years) in the BLM. The number of elderlies in the district has decreased slightly.

### ***Race***

Out of the CDM's total population, 96.1% are Black African, of whom the majority stay in townships such as Seshego and rural tribal villages (CDM Final IDP/Budget 2016/7-2020/21). Similarly, most the population in BLM is Black African (161 075), followed by White (1 006), Indian (151), Coloured (65) and unspecified (332). Sepedi is the most widely spoken language.

### **3.9.3 Economic background**

#### ***Unemployment and youth unemployment***

Employment status refers to whether a person is employed, unemployed or not economically active. The official unemployment rate therefore gives the number of unemployed as a percentage of the labour force. The labour force in turn is the part of the 15 - 64 year population that's ready to work and excludes persons not economically active (scholars, housewives, pensioners, disabled) and discouraged work-seekers. It is worth noting that, in South Africa, high unemployment coincides with low economic growth.

The overall official unemployment rate for South Africa during the first quarter of 2017 was 27.7%. Surprisingly the Limpopo Province, one of the poorer and smaller provinces in terms of economic size, has had the second lowest unemployment rate at 21.6% during this same period.

In line with the definition of official unemployment rate provided above, the unemployment and youth unemployment rates of the CDM and BLM are compared with the province and broader South Africa in the table below. South Africa experiences challenges with regards to youth unemployment. Amongst the unemployed (15-

64 years), the youth unemployment rates are almost double (2011). Youth unemployment in the CDM and BLM are also problematic.

Although youth unemployment improved since 2011, the youth remain vulnerable in the labour market with an unemployment rate of 37,1% which is 10,6 percentage points above the national average. Youth unemployment, however, registered a decline of 1,1 percentage points quarter-to-quarter. The latest figures for the CDM and BLM could not be obtained.

**Table 14: Unemployment rates 2011 (Census) and 2016**

	2011		2016	
	Unemployment rate %	Youth unemployment rate % (15-34)	Unemployment rate %	Youth unemployment rate % (15-34)
South Africa	29.8	52.5	27	37.1
Limpopo Province	38.9	42	19	-
CDM	37.2	47.4	-	-
BLM	39.2	47.2	-	-

Youth unemployment in South Africa is closely related to the inability of young people to obtain employment owing to their lack of experience, low education levels and various socio-economic factors, which are all too often compounded by a lack of skills. The result is a growing group of young people with severely limited access to formal sector employment, and limited means to do anything about this. The youth often drop out of school, have little work experience with poor literacy, numeracy and communication skills, making them undesirable for employers. In addition, these young people often lack resources enabling them to travel to areas where there are jobs. Those that do have the resources, family support and social networks, often display unrealistically high expectations for wages and salaries, resulting in prolonged periods of unemployment.

When young people are employed in the South African labour market, their employment intensity is the highest amongst the trade, agriculture, finance and other business services industries. Low and semi-skilled youth employment is concentrated in the trade industry, while high-skilled youth employment is in the community and social services, as well as finance and other business services industries ([www.statssa.gov.za](http://www.statssa.gov.za)).

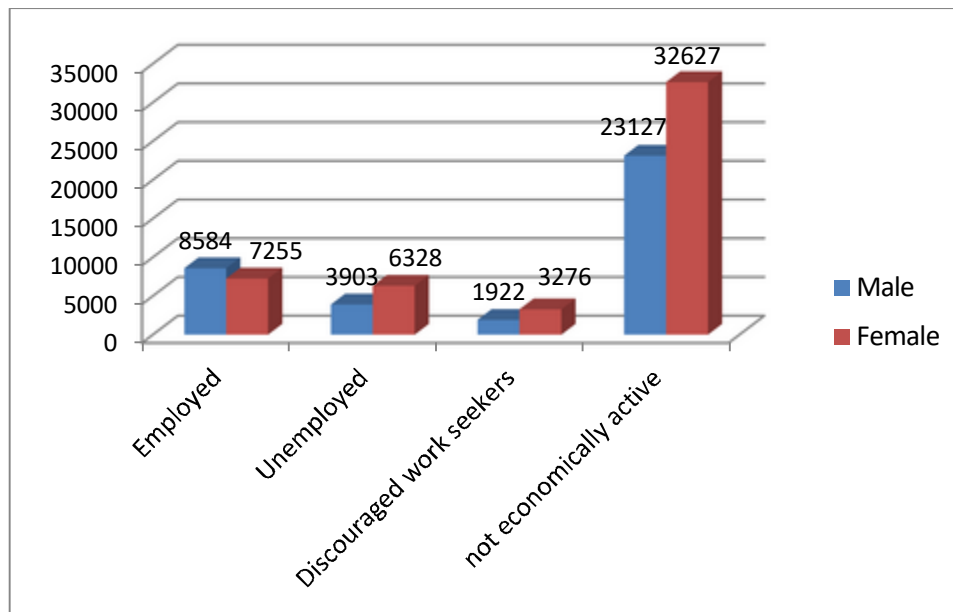
Unemployment levels in the area are much higher than the local and district averages. More than 56% of the Early Dawn and 54% of the Old Langsine labour force is unemployed, and communities in both villages suffer very high rates of poverty. This is despite being in an area that attracts tourists and has an abundance of agricultural land. Many community members do not have required skills and prefer to be employed as general workers (Waterberg SLP).

### ***Employment by gender***

The figure below depicts the employment status by gender of the population in the BLM.

Females are less likely to be employed, especially in jobs that are more labour and physically intensive. The unemployment amongst females in the BLM are almost double that of their male counterparts. Coupled with this

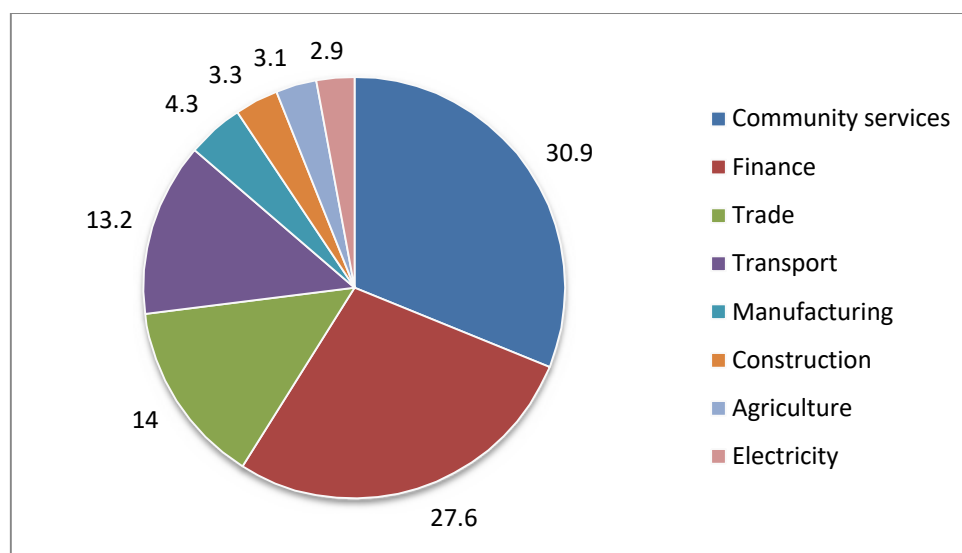
is the high ratio of female headed households in the BLM (57.3%) (<https://municipalities.co.za>). Women are also often forced to become the main breadwinners, thereby placing tremendous economic strain on households. The inclusion of women in the employment process should thus be addressed. In order to achieve and maintain the required Mining Charter objective of women participation in mining, Waterberg endeavours to eliminate any challenges faced through progressive strategies and action plans which will aim to encourage women to be developed in mining. Women will be given preference in filling certain positions and learnership opportunities. Amongst other, the identified women will be put on a mentoring programme to prepare them for the work in the various sections where they may be appointed upon completion of their programme (Waterberg SLP).



**Figure 12: Employment status by Gender, BLM**

### 3.9.4 Economic sectors

The main economic sectors in the CDM are Community services, Finance, Trade and Transport. Manufacturing and Agriculture only make up 4.3 and 3.1% respectively. In the BLM Agriculture, Mining and Tourism are the main economic contributors and are elaborated on the sections below.



**Figure 13: Main Economic sectors, CDM**

### ***Agriculture***

There is abundant land in the BLM, which is mainly used for agricultural development in the commercial sector and to a lesser extent for the less established subsistence farming sector. The sweet veld and mixed grasses make the BLM especially suitable for livestock farming, particularly for Nguni and Bonsmara breeds. In communal areas, where land is scarce, most farmers are practicing farming at subsistence level.

Game farming has been identified as one of the pillars of the agricultural sector, especially surrounding Alldays, Vivo, Tolwe, Maastroom and the Baltimore areas. Private game farms are prevalent in such areas and this has attracted massive tourist influx, especially during the winter hunting season. Unfortunately, the prospect of extermination through poaching has the potential to negatively impact this industry.

In terms of crop and vegetable production, the area is known for tomato and potato products that are mainly sold to national and international markets. The area is also suitable for tobacco cultivation and pumpkins.

Subsistence farming is seen as a way to subsidize low incomes. Slightly more than one quarter of the households (27%) subsidised their low income over the years through subsistence farming, such as small vegetable gardens, followed by livestock farming of chicken and cows for family consumption and selling to their communities. Due to a lack of entrepreneurial and production skills, this is done on only a very small scale (Waterberg SLP).

### ***Tourism***

The BLM LED strategy identifies tourism as one of the key economic drivers. The geographical location of the BLM between the Waterberg wetlands and the Dongola Trans-frontier Park, which encompasses the Mapungubwe area, is of great tourist significance. The BLM is rich with cultural heritage and boasts two nature reserves, namely Maleboho and Blouberg. There are German missions in Senwabarwana and Leipzig that are seen as heritage sites and also the 1903 prison in the Blouberg Mountain. Rock paintings and Iron Age sites are prevalent in the Makgabeng Mountains. There are a number of popular rock-climbing spots and hunting farms boast tourism, especially during the winter months. The Glen Alpine Dam provides the BLM with the opportunity

to enhance tourism, if developed to an acceptable standard. Tourists traverse through the BLM to access Botswana and Zimbabwe and the development of further overnight accommodation would be beneficial.

### ***Mining***

There are mining deposits, which have a potential of growing the economy and creating sustainable jobs, if explored and mined to the fullest. Potential of mineral deposits are found in areas such as Harris (platinum) and Arrie (pencil and coal, gold and other minerals) and huge potential for sand mining at Indermark and Eussorinca.

### **3.9.5 Local Economic Development**

The aim of a LED implemented by local Government is to achieve economic growth, alleviate poverty, and inclusively improve the quality of life of all community members to redress socio-economic imbalances. It is not an isolated function, and the output should be the result of co-operation between Government and private partnerships. Projects, budgets and strategies for job creation, SMME development and skills development and training that are incorporated in the Waterberg SLP should thus be in line and be linked with IDP and LED initiatives of the affected municipalities.

### ***CDM***

In order to address unemployment, CDM's LED function has established job creation targets and created permanent, temporary and internships through projects and programmes that create short and long-term employment, to meet the social and economic needs of communities. CDM is focusing on more labour-intensive methods during construction projects, resulting in skills development, income generation and poverty alleviation for locals. It has also implemented a School Entrepreneurial Support Project.

The CDM IDP further states that more emphasis needs to be placed on:

- Partnerships with private sector, to accelerate development initiatives in mining, tourism, agriculture and agro-processing; and
- SMME development which has the potential to accelerate job creation.

CDM has identified activity corridors and nodes (nodal development points) that are adjacent to or that link the main growth centres where future settlement and economic development opportunities should be channelled, and infrastructure investment should support localities that will become major growth nodes in South Africa and the SADC region. Twenty three per cent of the district population resides in these thirteen growth points, which include Senwabarwana, Alldays, Avon, and Eldorado in the BLM.

### ***BLM***

Key LED objectives for the BLM are listed as:

- Promotion of job creation in the municipality by 6% annually;
- Creation and promotion of LED initiatives in the SMME sector;
- Broadening of the skills base of the communities; and

- To acquire strategically located land for economic development.

A number of projects have been identified and funds have been allocated towards implementation including projects by Departments of Agriculture, Health, Housing and RAL. The importance of SMMEs should not be dismissed.

#### Retail and SMME development

The BLED Strategy recognizes the need for job creation through SMMEs and retails as pillars of growing the economy and job creation. The Strategy notes that the local retail sector has not been doing well in sustaining itself and recommends that the BLM be proactive in coordinating the retail and business sector and further come up with ways of supporting their sustainability. The Strategy identifies nodal points such as Eldorado, Alldays and Senwabarwana as areas where major retail should be encouraged. Three retail centers have been established in Senwabarwana and there is massive retail expansion in the town. A state-of-the-art retail center is currently under construction in Alldays, while Eldorado retail development is under the processes of surveying and environmental studies and finalization of land disposal and acquisition processes (Draft BLM IDP/Budget 2018/2019-2021).

#### Partnerships

Amongst some of the key private partners in development which the BLM has forged are Venetia Mine, MTN, Coal of Africa and Sanparks (Mapungubwe world heritage site). The partnership with Venetia Mine resulted in the implementation of infrastructure development projects, such as electrification of settlements; construction of schools; and community development initiatives on educational development. The BLM also partnered with the “UN Women” and Venetia Mine to capacitate female entrepreneurs known as AWOME (“Acceleration of Women Owned Micro Enterprises”). An NGO known as “Hand in Hand SA” was appointed and trained thirty (30) women from the BLM thus far, with the aim of training 250 women between 2018 and 2020.

Other avenues of corporate social investments (CSI) need to be clinched with McCormick Property Development (owners of Senwabarwana plaza), Coal of Africa and Sanparks. Recent partnerships are with Anglo-American/De Beers, where more emphasis is on building institutional capacity, Waterberg and Haccra mining houses (Draft BLM IDP/Budget 2018/2019-2021).

#### Local development needs

The communities of Old Langsine and Early Dawn (where the community profile for SLP purposes took place) indicated a high need for water and access roads. They experience serious water problems and indicated that whenever the pump is broken it will take days before it can be repaired. The provision of access roads to the villages will enhance economic spinoffs in the communities.

The Waterberg SLP specifies that the focus will be on infrastructure projects that will directly benefit large portions of the population, and which will have a long-lasting impact. In addition to employment, skills development, training and capacity building, Waterberg consulted with the BLM to endorse projects identified (Waterberg SLP):

- Provision of infrastructure and educational support to local schools;
- Mine and community bulk water supply and reticulation;

- Extension and equipping of existing clinic/health facility;
- Construction of 38km of road; and
- Support to local SMMEs (expansion of existing SMMEs).

### **3.9.6 Economic challenges**

The BLM area, as a predominantly rural municipality, encounters economic challenges, such as high unemployment levels - especially amongst the youth; high illiteracy levels; skills mismatch; and insufficient infrastructure to support job creation initiatives. Local businesses have also not done well in sustaining themselves. Either most of them have collapsed or are being rented out to traders from India and North Africa. One of the factors that might have contributed to such collapse of local businesses is the failure of the business community to work as a team with a local chamber of business taking the lead. Another contributing factor may be the level of business acumen and training available at the disposal of local business practitioners and the age of such practitioners that hamper them to adapt to a changing business environment for their sustainability (Draft BLM IDP/Budget 2018/2019-2021).

### **3.10 Cultural heritage**

A Baseline Cultural Heritage Assessment was conducted in 2015 in the proposed Extension Area as part of a prefeasibility study conducted for the Mining Right application process.

#### **3.10.1 Cultural Landscape - Makgabeng Plateau and rock art**

The Makgabeng Plateau is located about 45 km south-west of Vivo, at the western end of the Soutpansberg Mountain Range, about 22 km south-west of the Blouberg Mountain. The Makgabeng mountain is one of the three ranges in the province of Limpopo, South Africa. The other two mountain ranges are Soutpansberg and Blouberg. Makgabeng is the smallest of the three. The Makgabeng is a rugged and well-bushed plateau rising about 200m above the surrounding plains. It covers approximately 400 km<sup>2</sup> and lies just south of the 23rd degree parallel line.

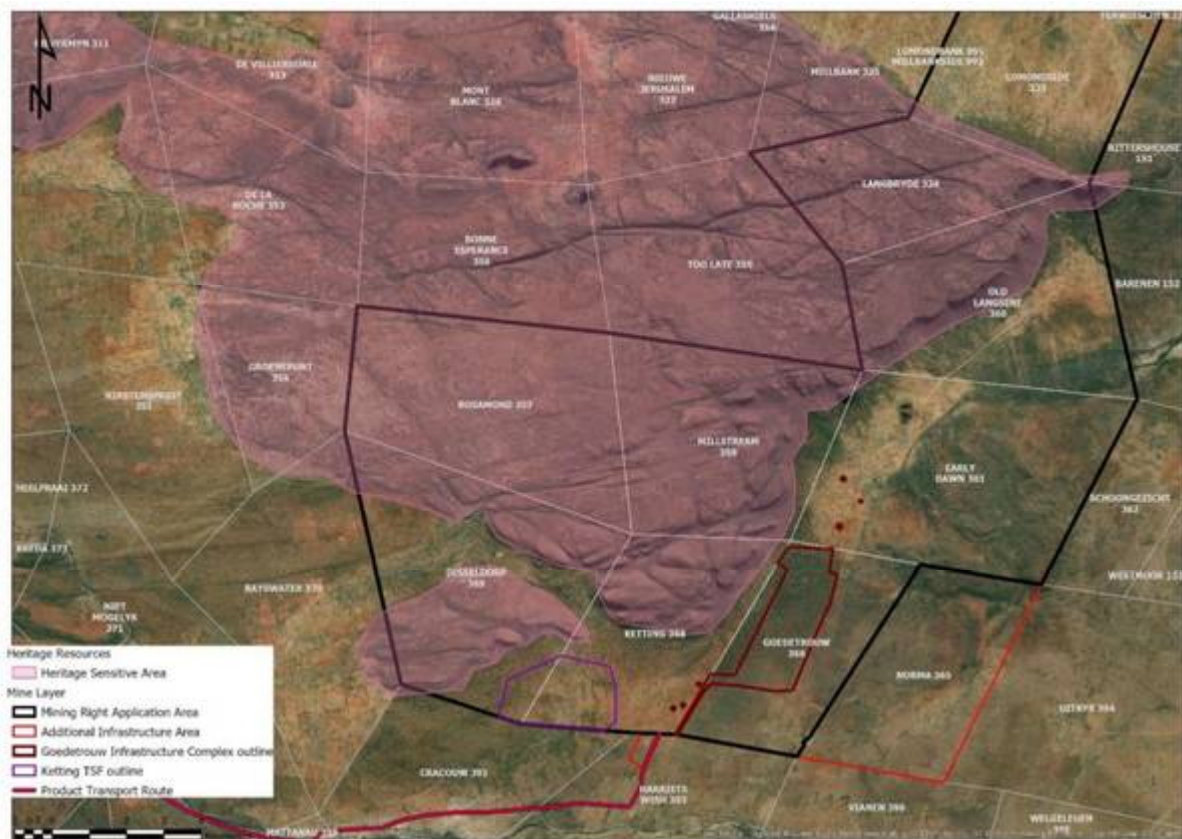
The villages and communities which surround this mountain are collectively known as belonging to Makgabeng. These surrounding villages include: Bays Water, Disseldorp (Mothakgale), Cracow, Calsruhe (Khala), Harrietswish (Garaweshi), Ketting (Lehwaneng), Goedetrouw (Kgatlu), Norma A and B, Uitkyk No. 1, 2 and 3, Schoongezicht, Early Dawn, Rosamond, Groenpunt, De La Roche, Devilliersdale, Mont Blanc, Bonne Esperance, Nieuwe Jerusalem, Too Late, Milbank (Ga Monyebodi), Langbryde, Old Langsyne, Lamonside (Ga-Lekgwara), Baranen, Gemarke, Rittershouse (Mokumuru), Normandy (Madibeng), Kirtenspruit (Sadu) and Non Parella.

One of the outstanding features of Makgabeng is the Khoisan and Bantu-speaking rock art paintings in the mountains. The fine paintings are evidence of traces of earliest human occupation in the area. The Makgabeng Plateau is home to over 890 San, Khoekhoe, Tswana and Northern Sotho rock art sites found hidden in sandstone outcrops and overhangs. The rock art at Makgabeng depicts the rich history of the indigenous people. It relays tales of war between the Boers on horseback and ox wagons, and Chief Malebogo.

In 2012 Rock Art Research Institute (RARI) became involved in a community-based heritage tourism project in the Makgabeng region. The BLM commissioned RARI to undertake a project focusing on the collection of ethnographic heritage, traditional folklore; the physical conservation of heritage resources; and strengthen the

heritage tourism market in the region. The rich cultural background and heritage resources in the region called for the development of a heritage management and conservation report (RARI & Van Schalkwyk 2009b). The purpose of the plan was to devise strategies for the conservation of both the physical and intangible aspects of the heritage resources. The conservation plan was followed by a Tourism Management Plan that looked for ways to utilize the heritage resources for sustainable tourism purposes (RARI & Van Schalkwyk 2009a). Through an extensive survey RARI and Van Schalkwyk (2009a; 2009b) identified that the heritage resources in the region were under threat due to several factors including natural deterioration, neglect and unplanned development. It was therefore determined that the ideal remedy to these challenges would be the integration of economic value to the cultural resources on a sustainable basis.

The Makgabeng Plateau is seen as being a very sensitive heritage area – refer to Figure 14.



**Figure 14: Heritage sensitive area associated with the Makgabeng Plateau.**

### 3.10.2 Archaeology

### 3.10.2.1 Stone Age

The Stone Age is the period in human history when lithic material was mainly used to produce tools (Coertze & Coertze 1996: 293). In South Africa the Stone Age can be divided in three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation. The division for the Stone Age according to Korsman & Meyer (1999) is as follows:



- Early Stone Age (ESA) 2 million – 150 000 years ago
- Middle Stone Age (MSA) 150 000 – 30 000 years ago
- Late Stone Age (LSA) 40 000 years ago – 1850 - A.D.

Many Stone Age sites have been identified previously in the Limpopo Province. Sites dated to the Early Stone Age were identified at Blaauwbank close to Rooiberg, at the Cave of hearths and Schoonheid close to Mokopane, at Olieboompoort to the north of Thabazimbi and at Kalkbank to the south of Schoemansdal (Bergh 1999:4).

Middle Stone Age sites are known at Tuinplaats to the east of Bela-Bela, at Olieboompoort to the north of Thabazimbi, at the Cave of Hearths and Rufus Cave close to Mokopane, at Grace Dieu and Mwulu Cave close to Polokwane, at Kalkbank to the south of Schoemansdal and at Noord-Brabant and Goergap to the east of Lephalale (Bergh 1999:4). One Middle Stone Age site is known from the farm Mont Blanc, close to the surveyed area (Sadr 2005).

Late Stone Age sites have been identified at Wellington Estates to the east of Settlers, at Modimolle, at Olieboompoort to the north of Thabazimbi, at the Cave of Hearths close to Mokopane, at Noord-Brabant close to Lephalale, at Kalkbank to the south of Schoemansdal and in the Greefswald area. Closer to the surveyed area only one Late Stone Age site is known. It is called the Makgabeng site close to Blouberg (Bergh 1999:4).

Rock art is also associated with the Late Stone Age. Such sites were found in abundance in the Limpopo Province. Rock paintings are located along the Limpopo River, the Soutpansberg, Waterberg, Strydpoortberg and the areas in between these. Rock engravings were found along the Mogalakwena and Limpopo Rivers, and between the Olifants and Steelpoort Rivers (Bergh 1999: 4). This includes the Mining Area and Extension Area.

It is clear that the mentioned sites were identified in rural areas and therefore there is a good chance of finding Stone Age sites in this environment, especially close to rivers and mountains. These natural features create an environment suitable for human habitation.

At least one Middle Stone Age site was identified in close proximity to the Mining Area (Nel et.al 2013: 43-44). Nel et.al. (2013: 20-27) also indicates the Late Stone Age existence in the more immediate vicinity of the Mining Area. They mention that more than 460 rock art sites have been documented in this region. However, Eastwood and Tlouamma (2006:9) indicates that they documented more than 670 sites in the region. This includes San rock art as well as finger paintings associated with the Khoi.

Rock paintings were also noted by Van Essen (2018), who conducted a biodiversity study on the plateau.

Late Stone Age sites on the Makgabeng Plateau was also researched and described by Bradfield et.al. (2009: 176-183). They indicate that research has been done in the past here by Roberts (1916), Mason (1962) and Sampson (1974). Bradfield excavated a specific shelter called Mphokwane.

Although no such sites were identified during the survey, it is clear from the above mentioned that Stone Age people did utilize and settled in the broader geographical area. There, however, are some hiatuses due to certain farms not having been researched before. One will therefore have to be careful during mining that sites are not disturbed. These are however expected to occur against and on top of the Makgabeng Plateau which is adjacent to the Mine Site Infrastructure Area.

Things to be on the lookout for would be caves, rock shelters, rock outcrops and areas with scattered stone tools in the open, especially close to rivers. This environment is found on the western sections of the farms Early Dawn and Ketting. Stone tools can be recognized by showing definite sharp edges as well as cut and hammering marks,

which would distinguish it from ordinary stones. Rock paintings may also be found in caves and rock shelters whereas large stones in the open may contain rock engravings.

### **3.10.2.2 Iron Age**

The Iron Age is the name given to the period of human history when metal was mainly used to produce metal artifacts (Coertze & Coertze 1996:346). In South Africa it can be divided in two separate phases according to Van der Ryst & Meyer (1999: 96-98), namely:

- Early Iron Age (EIA) 200 – 1000 A.D.
- Late Iron Age (LIA) 1000 – 1850 A.D.

Huffman (2007: xiii) however indicates that a Middle Iron Age should be included. His dates, which are now widely accepted in archaeological circles, are:

- Early Iron Age (EIA) 250 – 900 A.D.
- Middle Iron Age (MIA) 900 – 1300 A.D.
- Late Iron Age (LIA) 1300 – 1840 A.D.

Very few Early Iron Age sites have been identified. In Limpopo Province these include sites at Kommando Kop, Pont Drift, Mapungubwe and Schroda in the Limpopo Valley. Other sites are Happy Rest/ Matakoma close to Schoemansdal, Klein Afrika to the north of Louis Trichardt, the Eiland site along the upper Letaba River, Silver Leaves close to Tzaneen, at Harmonie to the south of Leydsdorp and at Diamant to the north of Thabazimbi (Bergh 1999: 6). Sites were also identified close to Burgersfort and Hoedspruit (Archaeos database). No Early Iron Age sites are indicated in a historical atlas (Bergh 1999) close to the Mining Area.

Middle Iron Age sites include the World Heritage site at Mapungubwe as well as K2, Kommandokop and Schroda in the Limpopo Valley (Bergh 1999: 7). No Middle Iron Age sites are indicated in a historical atlas (Bergh 1999) close to the Mining Area.

Late Iron Age sites are found in abundance throughout the Limpopo Province. Pelsaert (2011: 11) indicates that many such sites exist close to Alldays but does not provide any details. Known sites include those along the Sand and Levuvhu Rivers, various sites in the Kruger National Park (including Thulamela, Makahane and others), at least 58 sites near the town of Phalaborwa, 200 sites along the Lephalala River, 35 sites to the south of Polokwane, 42 sites to the east of Mokopane, 13 smelting sites in the Strydpoort Mountains and 63 sites between Thabazimbi and Rooiberg (Bergh 1999: 7). None of these are in the Mining Area.

Specific sites relating to archaeo-metallurgy were also identified. Sites where copper smelting were identified include some to the west and south of Musina, to the north and west of Phalaborwa (including Lolwe), sites to the south of Leydsdorp, between Tzaneen and Polokwane, along the Hout River and close to Modimolle. Sites where iron were worked include those at Tshimbupfe to the east of Louis Trichardt, sites around Phalaborwa, sites between Polokwane and Tzaneen, to the north and east of Modimolle and to the east of Thabazimbi. Signs of gold working were only found at four sites namely Mapungubwe, Machemma, Makahane and Thulamela. Tin workings were identified at Blaauwbank and Rooiberg in the south-west of the province (Bergh 1999: 8). More

sites known are sites on the farm Icon, Matoks, Manavela, Tavhatshena and the farm Stayt (Archaeos database). Van Schalkwyk also indicated that iron was worked at a site on the farm Millbank (Bradfield et.al. 2009: 180).

The lack of known sites in the Mining Area is merely an indication that these have not been surveyed in the recent past. Therefore, chances are good that Iron Age material and sites will be identified on some of these farms. Early Iron Age sites are usually found close to rivers. During a very recent survey such sites were indeed identified on the southern side of Blouberg and the northern side of the Makgabeng Plateau. Mention is made of several Early Iron Age sites on farms in and close to the Mining Area (Nel et.al. 2013: 20-23).

During the mentioned recent survey, in close proximity to the Mining Area, Nel et.al. (2013: 20-29, 35-40, 44-46) did identify Late Iron Age sites. They also mention rock art sites, known as finger paintings, associated with Northern Sotho speaking farming communities of the Late Iron Age. These were studied by Smith & Van Schalkwyk 2002: 235-254) who indicated that a specific painting of a camel can be dated to the early 20th century. Van Schalkwyk indicated that Iron Age farmers moved into the area during the 13th century. He also did some excavations on the farm Millbank on a 16th and 17th century LIA village (Bradfield et.al. 2009: 176).

Late Iron Age sites are normally found on the foot or against slopes of hills. These sites can be identified by extensive stone walled complexes that served as homesteads and cattle kraals.

Sometimes these sites can be identified by only a few potsherds. The lack of known sites closer to the Mining Area may only indicate that no research has been done in this area. During the mentioned recent survey near the Mining Area, Nel et.al. (2013: 20-29, 35-40, 44-46) did identify Late Iron Age sites. They also mention rock art sites, known as finger paintings, associated with Sotho speaking farming communities of the Late Iron Age.

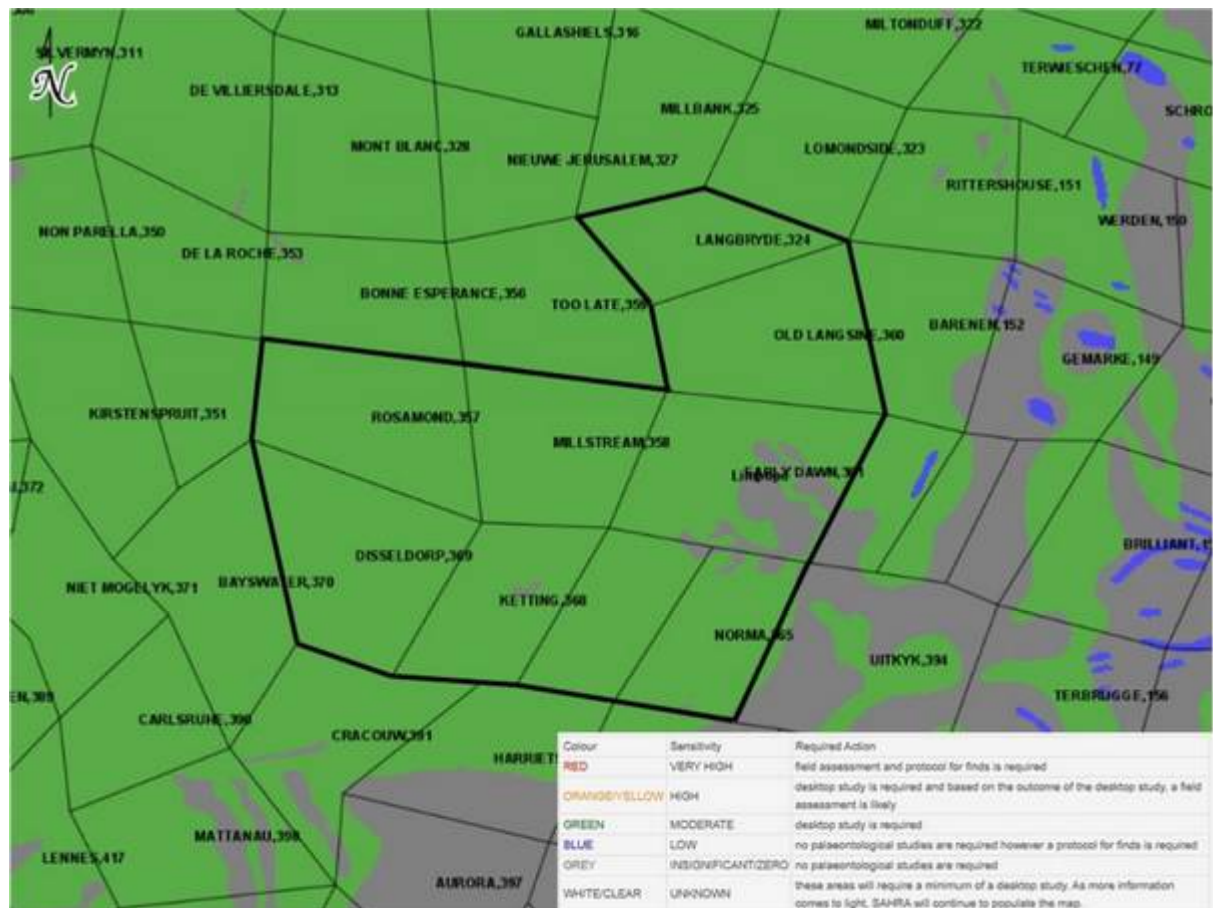
One such site was identified during the current survey, but since the environment is definitely suitable, one should be cautious. Caution should especially be taken when working in the areas close to mountains (against slopes, in saddles or on top) and rivers. On Goedetrouw some Iron Age remains were also noted (Van Vollenhoven 2015b).

On the farm Ketting a few sites have been identified by one of the project geologists. It includes seven Late Iron Age sites and one cave with pottery and other remains. The biodiversity specialist made mention of similar sites. These sites are important but are far away from the Mine Site Infrastructure Area.

The strategic position of some of these sites indicates that the sites were utilized during times of turmoil, e.g., the Difaquane or the wars against the former Boer republic of the ZAR. This would place it within the historical era, but the characteristics of the sites are similar to that of Late Iron Age sites.

### **3.10.3 Palaeontology**

According to SAHRIS the Waterberg Extension Area is classified as moderate, for which a desk top Palaeontological Impact Assessment (PIA) is required (Figure 15).

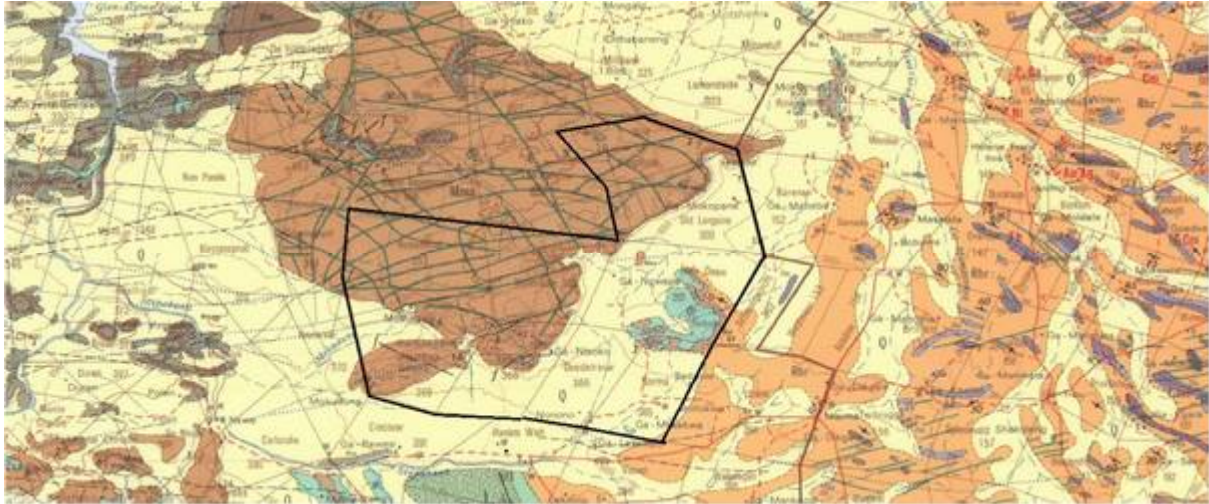


**Figure 15: Palaeontological categorization according to SAHRIS**

The geology was obtained from map 1:100 000, Geology of the RSA and 1:250 000, 2328 Pietersburg.

The Waterberg Group of rocks today occurs in several separate regions: in the Limpopo and Mpumalanga Provinces, an area spanning 20 000 km<sup>2</sup>. These separate patches probably originally formed a single sheet of sedimentary rocks that since became fragmented as a result of erosion. A deep red iron oxide is responsible for the colouration. As the rocks are chemically resistant and very hard, they produce spectacular cliffs and mountainous topography. The Waterberg Group is known for its reddish sandstone with conglomerates present between Pretoria and Middelburg, older than the coal and younger than the Magaliesberg Quartzite Formation. In the Cullinan-Middelburg base only one formation has been recognised, the unconformable Wilgerivier Formation. A threefold subdivision is recognised in the main basin, the Nylstroom, Matlabas and Kransberg Subgroups. It overlies the Loskop Formation. The Wilgerivier Formation overlies the Pretoria Group of the Transvaal Supergroup, the Selonsrivier Formation and the Loskop Formation. It is often covered with Karoo sediments.

Sandstone, grit, conglomerate and shale are present. It is 2 000 m in thickness. The conglomerate layer is often at the base. Trace fossils are found in the Waterberg Group.



**Figure 16: The geology of the development area (Fourie, 2019)**

Legend to map and short explanation:

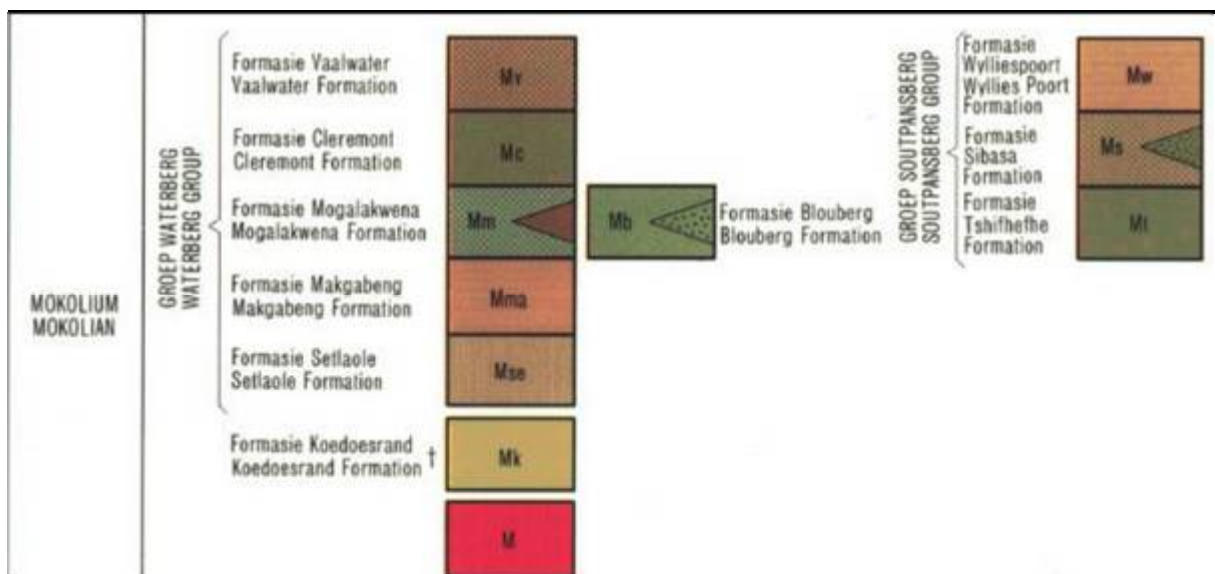
Q – Soil, sand, alluvium, calcrete, scree (yellow). Quaternary.

di – Diabase (green). Vaalian.

Mma – Medium-grained, yellowish, laminated sandstone (brown). Makgabeng Formation, Waterberg Group. Mokolian.

Rhr – Hout River Gneiss. Randian.

The Swaershoek and Alma Formations are in the Nylstroom Subgroup; Skilpadkop, Aasvoëlkop, Setlaole, and Makgabeng Formations in the Matlabas Subgroup; and Sandriviersberg, Mogalakwena, Cleremont and Vaalwater Formations in the Kransberg Subgroup. The Makgabeng Formation forms part of the Makgabeng Plateau with a thickness of 300 – 600 m up to 1 000 m. Also part of the Waterberg Group are the Koedoesrand Formation and the Blouberg Formation.



**Figure 17: Lithostratigraphy.**



The Mine Site Infrastructure Area will be located on the farms with Quaternary sediments.

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. The Quaternary Formation associated with the Waterberg Extension Area may contain fossils. A wide range of possible fossil remains, though these are often sparse, such as: mammalian bones and teeth, tortoise remains, ostrich eggshells, non-marine mollusc shells, ostracods, diatoms, and other micro fossil groups, trace fossils (e.g., calcretised termitaria, rhizoliths, burrows, vertebrate tracks), freshwater stromatolites, plant material such as peats, foliage, wood, pollens, within calc tufa. Stromatolite structures range from a centimetre to several tens of metres in size. They are the result of algal growth in shallow water, indicating a very rich growth that would have caused an enrichment in the amount of oxygen in the atmosphere. Stromatolites may also be present in the Makgabeng Formation.

According to the PIA, the Waterberg Extension Area is categorized as moderate for the Quaternary age rocks, and low for the Makgabeng Formation.

Rock unit	Significance/vulnerability	Recommended action
Q	Moderate	Desk top study is required.
Mma	Low	No palaeontological studies are required, however a protocol for finds is required.

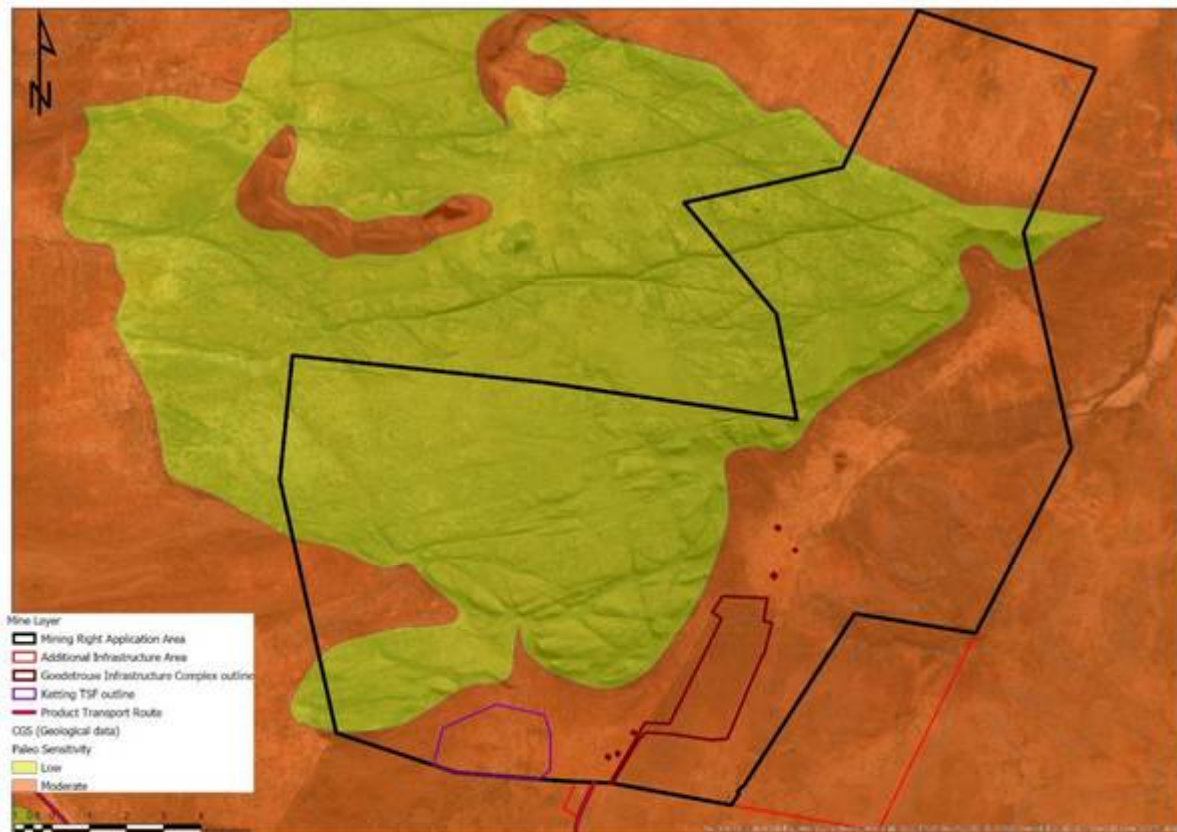


Figure 18: Palaeontological categorization.

### **3.10.4 Heritage Tourism**

Tourism can be considered as joint elements and relationships or coalitions that manifest due to communication between people travelling, companies, ethnic structures and ethnic groups of people, in connection with enticing peoples to visit and enjoy respective locations. Within this context, it is important to define a tourist, which can be explained as *“a visitor travelling to a place other than that of his or her usual environment for less than 12 consecutive months and whose purpose in taking the trip is not to receive remuneration for activities undertaken at the place visited”*.

According to the Department of Tourism they are committed to meaningfully contributing to the Government's objectives of inclusive economic growth, sustainable job creation, and redistribution and transformation of the industry through:

- Increasing the number of tourists who visit our country
- Increasing the geographic spread, length of stay and spend of all visitors
- Improving seasonal arrival patterns
- Working to transform the industry so that Historically Disadvantaged South Africans may benefit from the sector.

According to StatsSA, Limpopo (15.6%) and KwaZulu-Natal (14.9%) were the most visited destinations during overnight trips in Quarter 1 of 2018. A similar trend was observed in Quarter 2, where most tourists also visited Limpopo (18.4%) and Gauteng (15.4%). Northern Cape was the least popular destination in both Quarters 1 and 2. The main destination for day trips in Quarter 1 of 2018 was Gauteng (20.8%), followed by Limpopo (18.6%) and then Western Cape (12.0%). At 4.4%, Northern Cape had the least number of day trips in Quarter 1. In Quarter 2, the results indicate that Gauteng (24.0%) and Limpopo (20.0%) were the provinces most visited by day travelers.

#### **3.10.4.1 Tourism in Limpopo**

Polokwane provides access to various nature and wildlife viewing opportunities for ecotourists. The Polokwane Bird and Reptile Park is home to over 280 species of birds. The Polokwane Game Reserve houses various South African species of wildlife, birdlife, and plants in an unspoiled bushveld environment. The Moletzie Bird Sanctuary protects rare birds like the Cape vulture. The Modjadji Rainforest near Duiwelskloof holds the largest concentration of indigenous cycads in the world, and Cheune Crocodile Farm provides a place to learn about the life of crocodiles.

An extensive art collection is preserved in Polokwane's art gallery, open to the public. The city has more public sculptures per capita in its parks than elsewhere in South Africa. Polokwane was also the first to unveil a bust of the ex-president Nelson Mandela in its City Square (Civic Gardens), and it was authorised by Nelson Mandela personally.

The city is considered the premier hunting destination in South Africa.

Near Modjadjiskloof, at Sunland Baobab farms, there is a large Baobab tree which has been fashioned into a rather spacious pub.

The Limpopo Department of Economic Development, Environment and Tourism (LEDET) has targeted the province as a preferred eco-tourism destination. Its Environment and Tourism Programme encompasses tourism, protected areas and community environment development to achieve sustainable economic growth.

While Limpopo is one of South Africa's poorest provinces, it is rich in wildlife and heritage, which gives it an edge in attracting tourists. Both the private and public sectors are investing in tourism development.

#### **3.10.4.2 Tourism in Capricorn District**

The Capricorn District Municipality, with its air of myth, legend and prehistoric civilization, is a popular ecotourism destination in Limpopo, with no shortage of natural, historical and cultural attractions (Capricorn District Municipality, 2019). The district takes its name from the Tropic of Capricorn, one of the five major circles of latitude that mark maps of the Earth and which runs directly through this diverse landscape. The region's position makes it a perfect stopover between Gauteng and the northern areas of the province and between the country's north-western areas and the world-renowned Kruger National Park. It is also in close proximity to the neighbouring countries of Botswana, Zimbabwe, Mozambique and Swaziland.

The region is dominated by mountains and forests but also includes the provincial capital of Polokwane (formerly Pietersburg), which is a popular stopover on route to the Kruger National Park. The city has a certain charm to it, whether it be from the wide, jacaranda-lined avenues or the architecture of times gone by, that is so evident. Here visitors have plenty of cultural attractions to choose from such as the Bakone Malapa Northern Sotho Museum (015 295 2432), described as an open-air 'living' museum, where you can interactively learn about Sotho culture and explore a traditional Sotho tribal village as it existed 250 years ago.

CDM has identified tourism as a sector with high potential. Key interventions in the areas include marketing, developing identified tourist attractions, packaging and promoting tourist destinations. A need has also been identified to improve tourism research through different efforts such as coordinating and engaging industry players, promoting trade relations and supporting the development of community and local tourism. CDM is currently updating their tourism strategy to identify specific projects to invest in.

#### **3.10.4.3 Tourism in the Blouberg Local Municipal area**

BLMs name originates from the mountain range sporting the same name. This mountain range is located to the west of the well-known Soutpansberg Mountain Range. The word "Blouberg", which directly translates to "Blue Mountain", derives from the Afrikaans language.

This local municipality is situated in the northern reaches of the Limpopo Province, within the CDM. It borders two SADC (Southern African Development Community) countries, namely Zimbabwe and Botswana. Blouberg is also the largest of the four local municipalities in the Capricorn District and covers an approximate area of 9 248 km<sup>2</sup>. The area is easily accessible via the R521, from the direction of the provincial economic hub, Polokwane.

The prevalence of game farms has stimulated the area's tourism industry by attracting large numbers of hunters. The area's attractiveness as a tourist destination is also partly due to its rich cultural and heritage background, which includes rock art paintings at the Makgabeng Mountains, the Malebogo\Boer battlefields that have been declared a Provincial Heritage Site, the footprints of the missionaries at areas such as Leipzig and Milbank, and the presence of two nature reserves (Malebogo and Blouberg). The area's potential as a tourism development node is further reinforced by its geographical location between the Waterberg wetlands and the Dongola Transfrontier Park (which encompasses the UNESCO accredited Mapungubwe World Heritage Site). Senwabarwana, also previously known as "Bochum", is the economic hub of the BLM. It is approximately 85 km from Polokwane. The name Senwabarwana means "Where the bushmen drink", signifying this region's close ties with its rich and colourful heritage. The local inhabitants of the area are mostly comprised out of the Bahananwa and Batlokwa people, with a small cluster of Vha-Venda, Afrikaans and English-speaking residents living in the rural areas.



The Blouberg Local Municipality views tourism as one of the economic pillars due to its strategic location and tourism potential. It is focusing more efforts and resources into tourism to harness its potential to reduce the triple challenges of unemployment, poverty and inequality within the municipal area. The following programmes have been included in their Growth and Development Strategy, Vision 2040:

- Development of interpretation centres;
- Training of tour guides;
- Collection of oral heritage to traditional authorities;
- Development of community camp sites (including 1 at the Makgabeng Rock Art);
- Development of tourism booklets;
- Development of Tourism routes; and
- Tourism and heritage campaigns – e.g., road shows.

#### *Tourism Routes*

The concept of route tourism is a relatively new concept in tourism and therefore has been borrowed and adapted to cover a broad spectrum of tourism product types. Each destination along the route complies with a consistent theme, and the destinations have developed somewhat organically over a long period. The routes generally cover very large geographical spaces. This kind of route tourism is usually used as a mechanism to attract tourists to an area and to link several attractions that would independently not have the potential to entice visitors to spend time and money. Using a synergy effect promises to have greater pulling power and dispenses visitors' money among a larger number of recipients. The local definition commonly used in South Africa interprets the term, 'route tourism', as combining the tourism resources of several smaller centres and collectively marketing them as a single tourism destination region.

Within the Blouberg region there are many tourism routes connecting tourism destinations and shared with neighbouring regions and countries. These include:

- African Ivory Route: The route was named by hunters who tracked game across the Limpopo Province, Botswana, and Zimbabwe, including the northern expanse of the Kruger National Park. The route encapsulates 54 nature reserves, spanning over various terrains, including mountains, sandveld plains, and the Mapungubwe Cultural Landscape World Heritage Site. This route links -
- Blouberg in the west with the Great Limpopo Transfrontier Project, with a vision to connect nature reserves to enable wildlife to once again travel along the old migratory routes across the borders separating South Africa, Zimbabwe and Mozambique. The route has organized tours or self-drive packages.
- Greater Limpopo Birding Routes: The Greater Limpopo Birding Routes are some of the most prolific regions in the country for bird watching. It is an expansion of the initial Soutpansberg/Limpopo Birding Route. The route incorporates a series of mountain ranges, floodplains (where thousands of birds gather every year), as well as lowland forests and bushy savannahs.
- Greater Mapungubwe Heritage Route: The Greater Mapungubwe Heritage Route celebrates the incredibly rich history of the northern part of the Limpopo Province of South Africa. The route links numerous cultural (and natural) heritage sites via a circular route centered around key sites such as: the

Mapungubwe World Heritage Site, the Thulamela Archaeological Site and the cluster of heritage sites surrounding the sacred Lake Fundudzi and royal Dzata Museum.

- Seraki Blouberg Route: The Seraki Blouberg Route is located at the foothills of the Blouberg Mountain. The route's path intertwines through a few local villages, fascinating community projects, natural attractions and an amazing diverse range of cultural heritage and natural treasures. The boundaries of the route are constituted by the Blouberg Mountain, Makgabeng Mountain and Malebogo (Maleboch) Nature Reserve on the one side, and the Blouberg Nature Reserve on the other side. The route also incorporates attractions found at the summit of this majestic mountain and is deeply entrenched in the history of its people.

#### *Blouberg Tourism destinations and facilities*

Within the BLM area, tourism destinations and facilities are made up of nature-based, heritage and adventure-based destinations. These include:

- Blouberg Nature Reserve;
- Maleboch Nature Reserve;
- Wonderkop Nature Reserve;
- Makgabeng Plateau and Rock art;
- Culture and art shops within the local villages and Senwabarwana; and
- Lodges and safari camps in the surrounding area.

Some of the activities provided by the local tourism industry include:

- Hiking in the mountainous areas;
- Birdwatching;
- Visiting rock art and other heritage sites;
- Shopping for local goods;
- Game watching; and
- Hunting.

#### **2.9.2 Environmental Aspects Which May Require Protection and/or Remediation**

The proposed Extension Area is identified as a Critical Biodiversity Area (CBA1 & CBA2) according to the Limpopo Conservation Plan (CPLAN). The proposed Extension Area is regarded to have high to medium sensitivity. The application area does not fall within a Threatened Ecosystem as described in NEMBA (2011).

The Extension Area is located 13 km south of the global Blouberg IBA, a partially protected area of approximately 36 270 ha with the focus being the world's largest colony of Cape vultures *Gyps coprotheres*.

The proposed Extension Area is located within the VBR that spans more than 30 000 ha, proclaimed in 2009 (VBR 2018). The Extension Area forms part of the transitional range of the VBR with ESS indexes of 5-7 and 11-14 for the low-lying areas and the Makgabeng Plateau respectively.

These environmental aspects, both within the application and surrounding area, may require protection or remediation. The environmental aspects have been included in the action plan and technical management measures contained in this BAR.

#### 4. Methodology used in determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks

This BAR relates to the application to extend Waterberg's existing and approved mining activities to the adjacent land. The impacts of the mining activities has already been assessed. This section of the Report presents a summary of the impact assessment methodology used and the outcome of the impact assessment undertaken for the existing and approved mining.

The proposed amendment will increase the extent of the anticipated impacts by approximately 4 488 ha.

No physical construction will take place as no permanent infrastructure will be established on the Extension Area.

NOTE: Planned prospecting and mining as recorded in the Mining Work Programme will be conducted underground and as such will not require any new Environmental Authorisations under the current Mining Right. No negative environmental impacts are therefor expected.

##### 4.1 Methodology for assessing impact significance

The impact assessment has been compiled in terms of the following life cycle phases of the Waterberg Project:

**Table 15: Phases of the activity**

Phase	Activity	Impact
1. Construction phase	This phase starts when the specific areas are reached during underground mining activities.	BAR and EMPr
2. Operational phase	This phase comprises the longest period associated with the project and starts when the underground prospecting and possible mining activities are conducted.	BAR and EMPr
3. Decommissioning phase.	This phase starts when the last activity in completed and consists mostly of decommissioning and rehabilitation activities. Decommissioning includes the complete removal of all infrastructure.	BAR and EMPr

The evaluation of impacts was conducted in terms of the following criteria.

**Table 16: Criteria for EIA assessment.**

Magnitude		
Minor	1	Environment remains unaffected.
Low	2	Environment might be negligibly affected.
Moderate	3	Environment might be notably affected.
High	4	Environment might be considerably affected.
Very High	5	Environment might be severely and irreversibly affected.
Extent		

Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3 – 5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
<b>Duration of impact</b>		
Immediate	1	Effect occurs periodically throughout the life of the activity and is short lived.
Short term	2	Effect lasts for up to a year.
Medium term	3	Effect continues for a period between 1 and 5 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	Effect is permanent and will last even after the decommissioning.
<b>Probability of occurrence</b>		
Improbable	1	Less than 25% chance of occurring.
Low	2	Between 25 and 50% chance of occurring.
Medium	3	Between 50 and 75% chance of occurring.
High	4	Greater than 75% chance of occurring.
Definite	5	Will occur regardless of any preventative measures.

The significance of the impacts was determined using the following formula:

$$\text{Significance} = (\text{Magnitude} + \text{Duration} + \text{Extent}) \times \text{Probability}$$

<b>Significance of predicted impact</b>		
Low	0 – 25	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation.
Medium	26– 50	Where the impact can have an influence on the environment and should be mitigated.
High	51 - 75	Where the impact will definitely influence the environment and must be mitigated, where possible.

**5. Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts**

This BAR relates to the application to extend Waterberg's existing and approved mining activities to the adjacent land. The impacts of the mining activity have already been assessed. This section of the Report presents a summary of the impact assessment methodology used and the outcome of the impact assessment undertaken for the existing and approved mining.

The proposed amendment will increase the extent of the anticipated impacts by approximately 4 488 ha.

NOTE: No physical construction will take place as no permanent infrastructure will be established on the Extension Area.

**5.1 Impact on Topography**

No impact is anticipated on the topography of the proposed Extension Area.

**5.2 Impacts on Soil**

No impact is anticipated on the soil of the proposed Extension Area.

**5.3 Impacts on Land Use**

No impact is anticipated on the land use of the proposed Extension Area.

**5.4 Impacts on Biodiversity**

No impact is anticipated on the biodiversity of the proposed Extension Area.

**5.5 Impacts on Surface Water Resources**

No impact is anticipated on the surface water resources of the proposed Extension Area.

**5.6 Pollution of Groundwater**

Mining activities have the potential to impact on groundwater resources through potential pollution and/or contamination as a result of activities such as the actual mining method employed and resultant geological exposure of oxidising materials, seepage, spillages and both mineralised and non-mineralised waste streams. No additional impacts are anticipated on the groundwater resources of the proposed Extension Area. Impacts have been identified during the initial Mining Right application.

**5.7 Impacts of Environmental Pollution**

Environmental pollution refers to any contamination of the environment resulting from mining activities. The types of impacts related to environmental pollution include hydrocarbon spills, sewage spills, and decant from underground workings. Environmental pollution can affect surface water, groundwater, wetlands, soil resources,

and air quality. Poorly designed wash bays, accidental spillages, related water facilities on site, hydrocarbon spills from heavy machinery and vehicles onsite, the removal or capping of waste products from the site, the intentional washing and rinsing of equipment, storage and use of hydrocarbons and other hazardous materials including cement, and improper waste handling, storage and disposal can all be sources of environmental pollution.

No environmental pollution is anticipated.

## **5.8 Social Impacts**

It is important to understand the difference between a social change process and a social impact. Social change processes are set in motion by project activities or policies. Social change processes can be measured objectively, independent of the local context. Examples of a social change process are increase in the population, relocation or presence of temporary workers. Under certain circumstances these processes may result in social impacts, but if managed properly these changes may not create impacts. Whether impacts are caused will depend on the characteristics and history of the host community, and the extent of mitigation measures that are put in place. A social impact is something that is experienced or felt by humans. It can be positive or negative. Social impacts can be experienced in a physical or perceptual sense. Social impacts can be either objective or subjective. Objective social impacts can be quantified and verified by independent observers in the local context, such as changes in employment patterns, in standard of living or in health and safety. Subjective social impacts occur “in the heads” or emotions of people, such as negative public attitudes, psychological stress or reduced quality of life. It is very likely that a number of social change processes will be set in motion by the Waterberg Project. Whether these processes result in social impacts will depend on the successful implementation of the suggested mitigation measures.

No additional social impacts are anticipated. The social impacts identified during the initial Mining Right application will continue.

## **5.9 Impacts on Health and Safety**

No additional impacts on health and safety are anticipated. The impacts identified during the initial Mining Right application will continue.

## **5.10 Impacts on Transportation, Infrastructure and Traffic**

There will be no traffic impact in the proposed Extension Area.

## **5.11 Visual Impact**

No visual impact is anticipated in the proposed Extension Area.

## **5.12 Impacts on Heritage and Cultural Resources**

No impacts on the heritage and cultural resources are anticipated. It must be noted that all planned operations are to be conducted underground with no surface impacts.

### **5.13 Impacts on Air Quality**

No impact is anticipated on the air quality of the proposed Extension Area.

### **5.14 Noise Impact**

No noise impact is anticipated in the proposed Extension Area.

### **5.15 Blasting and Vibration**

Blasting and vibrations will cause no additional impacts. The impacts identified during the initial Mining Right application will continue.

## **6. The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected**

Positive impacts of the proposed Waterberg Project can be summarised as follows:

- **Employment** – The Waterberg Extension Project has the potential to extend the LoM significantly. Thus, employees will remain employed for an extended period. Employment will contribute to the overall socio-economic profile of the local area; and
- **Continued Tax Base and Revenue** – The continued mining would result in continued revenue for Waterberg and associated tax contributions towards the country.

There are currently no negative impacts associated with the extension of the current Mining Area.

## **7. The possible mitigation measures that could be applied and the level of risk**

Management and mitigation measures are presented in the approved EMP and is included as Appendix 1

## **8. Motivation where no alternative sites were considered**

No property alternatives have been considered as the envisaged prospecting and mining operations will occur on properties already utilised for the mining operations.

## **9. Statement motivating the alternative development location within the overall site**

For the reasons discussed in this BAR, no alternative development locations have been considered for the proposed Waterberg Extension Project.



**10. Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.**

NOTE: Planned prospecting and mining as recorded in the Mining Work Programme will be conducted underground and as such will not require any new Environmental Authorisations under the current Mining Right. No negative environmental impacts are therefor expected on the Extension Area.

No physical construction will take place as no permanent infrastructure will be established on the Extension Area.

**11. Assessment of each identified potentially significant impact and risk.**

Planned prospecting and mining as recorded in the Mining Work Programme will be conducted underground and as such will not require any new Environmental Authorisations under the current Mining Right. No negative environmental impacts are therefor expected.

**12. Summary of specialist reports.**

Due to the nature of the planned activities, it was not deemed necessary to conduct any additional specialist studies other than that already conducted for the initial Mining Right application.

**13. Environmental impact statement.**

In accordance with the EIA Regulations GN R543 31(2)(n), the EAP must provide an opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation must be stated.

An impact assessment has been undertaken during the initial Mining Right application, which has incorporated extensive consultation with and participation of I&APs. It is the EAP's opinion that due process has been followed. Where impacts have been found to be potentially significant, various mitigation measures to manage and monitor the impacts of the Waterberg Project have been proposed.

In Bateleur's professional opinion, there are no anticipated impacts that constitute a fatal flaw for the proposed Waterberg Extension Project. Nevertheless, the recommended mitigation measures proposed in the approved EMPr must be implemented to minimise the impacts and ensuring compliance with current legislative requirements.

It is recommended that the proposed Waterberg Extension Project be allowed to proceed on the assumption that the environmental and social management commitments are adhered to, the Waterberg Extension Project description remains as per the description provided in this BAR and considering the positive social impacts associated with the project.

#### **14. Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR**

The approved EMPr seeks to achieve a required end state and describes how activities that have, or could have, an adverse impact on the environment will be mitigated, controlled and monitored.

The approved EMPr addresses the environmental impacts during the Operational, Decommissioning and Post-Closure Phases of the approved Waterberg Project. Due regard must be given to environmental protection during the entire project. Several environmental recommendations are therefore made to achieve environmental protection.

The environmental and social objectives are set to allow the mining of the PGMs in an environmental and socially responsible fashion while ensuring that sustainable closure can be achieved. To achieve closure, the correct decisions need to be taken during the planning phase of the project.

#### **15. Aspects for inclusion as conditions of authorisation**

Waterberg will continue to adhere to the conditions set out in its approved authorisations (EMPr, 2018).

Further to these conditions, it is requested that the following conditions be included:

- Continued monitoring must be undertaken as described in the monitoring programme provided in the approved EMPr; and
- The studies and impact assessment have been based on the proposed mine layout and Mining Works Programme for the initial Mining Right application. Should there be any changes to the proposed Waterberg Extension Project description, the adequacy and accuracy of the work may be affected, and additional work may be required to address the limitations.

After consideration of the concerns raised by SAHRA, Waterberg is prepared to conduct the following to address SAHRA's concerns:

1. Conceptual geological modelling based on available information to determine the likely depth of the mineral resources on the two properties.
2. Complete a high-level blasting assessment / statement to indicate the potential vibration levels at surface level and the potential risk to heritage resources on surface.
3. Complete a desktop palaeontological assessment / statement to determine the potential occurrence of fossils at the depth of the mineral resource and the potential associated risks.
4. Complete a high-level heritage impact assessment based on the geological modelling and blasting assessment to determine the potential risk of subsidence and vibrations on the sensitive heritage resources and landscape.

## **16. Description of any assumptions, uncertainties and gaps in knowledge**

Certain assumptions, limitations, and uncertainties are associated with the BAR. These are detailed for each aspect below:

### **16.1 Heritage**

Although all efforts were made to locate, identify and record all possible cultural heritage sites and features (including archaeological remains) there is always a possibility that some might have been missed as a result of grass cover and other factors. The subterranean nature of these resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any development actions then an expert should be contacted to investigate and provide recommendations on the way forward. From a cultural heritage point of view the development can therefore continue, taking cognisance of the recommendations.

## **17. Reasoned opinion as to whether the proposed activity should or should not be authorised**

It is the opinion of the EAP that the proposed Waterberg Extension Project should be approved and the reasons for this opinion are discussed below.

### **17.1 Reasons why the activity should be authorised or not**

The findings of the impact assessment have shown that the proposed inclusion of additional farms to the existing approved Mining Right and its associated activities may result in negligible negative environmental impacts. Based on the assessment of the impacts associated with the addition of the farms, it is concluded that the proposed Waterberg Extension Project should be authorised, provided that the mitigation measures of the approved EMP are applied diligently.

### **17.2 Conditions that must be included in the authorisation**

These conditions have been listed in Section 15 above.

## **18. Period for which the environmental authorisation is required**

The EA is required for a period of 45 years.

## **19. Undertaking**

The undertaking required to meet the requirements of this section is provided at the end of the EMP Report in Part B, Section 12.

## **20. Financial Provision**

The Regulations pertaining to the Financial Provision for Prospecting, Mining and Production Operations promulgated under section 44(A)(e), (f), (g), (h) read with sections 24(5)(b)(ix), 24(5)(d), 24N, 24P and 24R of the NEMA have been considered and this is anticipated to result in an increase in the rehabilitation costs estimated using the above mentioned quantum. The amount that is required to both manage and rehabilitate the environment in respect of rehabilitation is reflected in the quantum of financial provision in the approved EMPr.

## **21. Specific Information required by the competent Authority**

Compliance with the provisions of sections 24(4)(a) and (b) read with section 24(3)(a) and (7) of NEMA is required. The BAR must include the:

### **21.1 Impact on the socio-economic conditions of any directly affected person**

The proposed extension of the Mining Area is not expected to have any additional direct socio-economic impacts. The jobs generated by the mine (directly or indirectly) will be retained by the approval of this amendment.

### **21.2 Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act.**

Prospecting and possible mining activities will be conducted underground and will have no effect on sites of cultural significance that have been identified in or around the Extension Area.

## **22. Other matters required in terms of Sections 24(4)(a) and (b) of the Act**

There are no other matters required in terms of section 24(4)(A) and (B) of the Act.

## **PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

Waterberg JV Resources (Pty) Ltd has an existing and approved EMPr. It is proposed that this EMPr be applied to the Extension Area, as it contains all the necessary management and mitigation measures to ensure the potential impacts of this mining method in this area are managed to acceptable levels of severity. The EMPr will be included as Appendix 1.

## UNDERTAKING

The EAP herewith confirms:

- the correctness of the information provided in the BAR;
- the inclusion of comments and inputs from stakeholders and I&APs;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- the acceptability of the Waterberg Extension Project in relation to the finding of the assessment and level of mitigation proposed.

<b>Signature of Environmental Assessment Practitioner</b>	
<b>Date</b>	

## **APPENDIX 1:**

### **Approved Environmental Management Programme**

## **APPENDIX 2:**

### **Copy of approved Integrated Environmental Authorisation**



## **APPENDIX 3:**

### **Environmental Authorisation application form**

## **APPENDIX 4:**

### **CV of EAP**

## **APPENDIX 5:**

### **Public Participation Report**

## **APPENDIX 6:**

### **Relevant Maps**