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# **Applicant: Pilanesberg Platinum Mines (Pty) Ltd**

*DMR Reference Numbers: NW30/5/1/2/2/320MR*

*DEA Reference Number: 12/9/11/L750/7*

*DEDECT Reference Number: NWP/EIA/88/2011*

## **PILANESBERG PLATINUM MINES PROPOSED TUSCHENKOMST PIT EXTENSION**

### **SCOPING REPORT**

Submitted with due regard to

#### **consultation with communities and interested and affected parties**

as required in terms of Regulation 49 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002), and in accordance with the standard directive for the compilation thereof as published on the official website of the Department of Mineral Resources

and

as required in terms of Regulation 28 of the National Environmental Management Act (Act 107 of 1998).

## DOCUMENT INFORMATION

<b>Title</b>	Pilanesberg Platinum Mines Proposed Tuschenkomst Pit Extension
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<b>Date last printed</b>	2012/09/26 01:53:00 PM
<b>Date last saved</b>	2012/09/26 01:53:00 PM
<b>Keywords</b>	Sedibelo West, Wilgespruit, PPM, pit extension, platinum, Pilanesberg
<b>Project Number</b>	B007-19
<b>Report Number</b>	1
<b>Status</b>	Final
<b>Issue Date</b>	August 2012

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# PILANESBERG PLATINUM MINES PROPOSED TUSCHENKOMST PIT EXTENSION

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## ACRONYMS AND ABBREVIATIONS

Below a list of acronyms and abbreviations used in this report.

Acronyms / Abbreviations	Definition
%	Percentage
AGES	Africa Geo-Environmental Services Pty Ltd
Al	Aluminium
BBK	Bakgatla-Ba-Kgafela
BBKTA	Bakgatla-Ba-Kgafela Traditional Authority
BBKTC	Bakgatla-Ba-Kgafela Traditional Council
BID	Background information document
BPDM	Bojanala Platinum District Municipality
Ca	Calcium
Cd	Cadmium
CEC	Cation exchange capacity
Cl	Chloride
DAFF	Department of Agriculture, Forestry and Fisheries
dBA	A-weighted decibel
DEA	Department of Environmental Affairs
DEDECT	Department of Economic Development, Environment, Conservation and Tourism
DEAT	Department of Environmental Affairs and Tourism
DMR	Department of Mineral Resources
DPWRT	Department of Public Works, Roads and Transport
DRDLR	Department of Rural Development and Land Reform
DWA	Department of Water Affairs (Formerly DWAF)
DWEA	Department of Water and Environment Affairs
EAP	Environmental Assessment Practitioners
EAPSA	Environmental assessment practitioner of Southern Africa
EC	Electrical conductivity (EC)
EIA	Environmental impact assessment
EMP	Environmental management programme
SIA	Social impact assessment
ESS	Earth Science Solutions
Fe	Iron (Fe)
GDP	Gross domestic profit
HIA	Heritage Impact Assessment
HPC	Heritage Park Corridor
IAPs	Interested and/or affected parties
IBA	Important Bird Area
IBMR	Itereleng Bakgatla Mineral Resources (Pty) Ltd)
IDP	Integrated Development Plan
IWWULA	Integrated Waste and Water Use License Application
K	Potassium
km <sup>2</sup>	Square kilometres
LOM	Life of mine
m	Metres
mamsl	metres above mean sea level
m/s	metres per second
m <sup>2</sup>	Square metres

<b>Acronyms / Abbreviations</b>	<b>Definition</b>
m <sup>3</sup>	Cubic metre
MAR	Mean annual runoff
mbgl	Metres below ground level
Mg	Magnesium
MKLM	Moses Kotane Local Municipality
ML	Megalitre (1 million litres)
mm	millimetres
Mn	Manganese
MPRDA	Mineral and Petroleum Resources Development Act
MVA	Megavolt ampere
MWB	Magalies Water Board
MW	Megawatts
N	Nitrogen
NAAQS	National Ambient Air Quality Standards
Na	Sodium (Na)
NB	Nominal Bore
NEMA	National Environmental Management Act
NEMA:BA	:Biodiversity Act
NEMA: WA	:Waste Management Act
Ni	Nickel
NLA	Newton Landscape Architects
NO <sub>2</sub>	Nitrous oxide
DEDECT	Department of Economic Development, Environment, Conservation and Tourism
NWEF	North West Eco Forum
NWPTB	North West Parks and Tourism Board
°C	Degrees Celsius
PGM	Platinum Group Metals
PM10	Particulate matter with a fraction smaller than 10µm (microns)
PrSciNat	Registered professional in natural science
ROM	Run-of-mine
RWD	Return water dam
SACNSP	South African Council for Natural Scientific Professionals
SAHRA	South African Heritage Resources Agency
SANBI	South African National Botanical Institute
SANS	South African National Standards
Se	Selenium
SDF	Standard Design Flood
SO <sub>2</sub>	Sulphur dioxide
SO <sub>4</sub>	Sulphate (SO <sub>4</sub> )
TDS	Total dissolved solids
TSS	Total suspended solids
TSF	Tailings storage facility
TSP	Total suspended particles
WMA	Water Management Area
WRD	Waste Rock Dump



## INTRODUCTION

### Introduction to the proposed project

Pilanesberg Platinum Mines (Pty) Ltd (PPM) a wholly owned subsidiary of Platmin South Africa (Pty) Ltd (Platmin) operates Pilanesberg Platinum Mine (PPM) to the west and north-west of the Pilanesberg National Park in the North West Province (see Figure 1). The mining operations, currently focussed around the Tuschenkomst open pit, occupy land on the farms Groenfontein 138JP, Wilgespruit 2JQ, Cyferkuil 1JQ, Tuschenkomst 135JP and Witkleifontein 136JP (see Figure 2). These farms are in turn located within the Moses Kotane Local Municipality (MKLM) which in turn forms part of the wider Bojanala Platinum District Municipality (BPDM).

The current and approved mining operation comprises a series of open pits, temporary waste rock and topsoil stockpiles, haul roads, a concentrator plant, a tailings disposal facility, a sewage plant, offices, workshops and other support infrastructure (See Figure 3).

The mine was constructed and operates under an approved Environmental Management Programme (Metago, 2007) ('the approved EMP') (DMR Ref No: NW30/5/1/2/2/320MR and NEMA Ref No: EIA 410/2005NW) and has been operational on the main Tuschenkomst open pit since the beginning of 2009. Since the approval of the original environmental impact assessment and environmental management programme report (EIA and EMP) by the DMR in 2008 and the scheduled processes by North West Provincial Department of Economic Development, Environment, Conservation and Tourism (DEDECT) in 2007, PPM has submitted two further EIA and EMP amendments to cater for the planned changes to the PPM mine. The first amendment (submitted in June 2009) covers a road diversion, relocation of approved infrastructure and the addition of support infrastructure. This amendment has been authorised by the DEDECT (7 November 2011) and by the DMR (8 November 2011). The second amendment (submitted to the DMR in August 2011) to amend the closure objectives of the Tuschenkomst pit from backfilling and re-establishment of land to a water supply and tourism hub facility. This amendment was approved by the DMR on 17 April 2012. This report constitutes a third EIA and EMP amendment, for a project area that will be known as the Sedibelo West Project Area.

As part of a joint venture agreement, Pilanesberg Platinum Mines (Pty) Ltd (PPM) and the Itereleng Bakgatla Mineral Resources (Pty) Ltd (IBMR), Richtrau No 123 (Pty) Ltd (Richtrau) propose to develop three separate projects which are situated on neighbouring farms that could function as a combined mining operation (see Figure 2) in future. In addition to the above-mentioned PPM Tuschenkomst pit extension, the combined mining operation would also include:

- Sedibelo Platinum Mine (Sedibelo), a developing mine owned and operated by the IBMR, located on the farms Wilgespruit 2JQ, portion 1 of Rooderand 46JQ, Legkraal 45JQ and Koedoesfontein 42JQ. In broad terms, the approved Sedibelo operation comprises an open pit and underground mining, and

associated surface infrastructure. It is proposed that the approved infrastructure be repositioned and new infrastructure be established to better suit the proposed combined mining operation.

- Magazynskraal is where Richtrau proposes to develop an underground platinum mining operation and establish related surface infrastructure to support the mining operation on the farm Magazynskraal 3JQ.

These three developments are the subject of three separate EIAs, therefore this Scoping Report only addresses the proposed PPM Tuschenkomst pit extension.

The activities being proposed as part of this third amendment report are: the expansion of the Tuschenkomst open pit onto the farms Wilgespruit 2JQ and Portion 1 of Rooderand 46JQ, to expand the footprint of the existing waste rock dump on the farm Tuschenkomst 135JP, construction of a haul road network, telecommunication/s tower/s, topsoil stockpiles, storm water infrastructure, storm water controls, dams and bridges over the Wilgespruit within the project site (see Figure 3).

The remaining life of mine of the Tuschenkomst pit is currently 8-10 years, the addition of the Sedibelo West Mining Area to the Pilanesberg Mining Area will not increase the production rate of the mine, but will increase the anticipated life of mine (LoM) by approximately 6 years i.e. to the end of 2025/2026.

Prior to the commencement of the proposed project, an environmental impact assessment (EIA) is required in terms of the Mineral and Petroleum Resources Development Act, 28 of 2002 (MPRDA), the National Environmental Management Act, 107 of 1998 (NEMA), and the National Environmental Management: Waste Act, 59 of 2008 (NEMWA).

SLR Consulting (Africa) (Pty) Ltd (SLR), an independent firm of environmental consultants (formally known as Metago Environmental Engineers (Pty) Ltd), has been appointed to manage the environmental process.

The EIA process comprises two phases: the scoping phase and EIA/EMP phase. This report describes the scoping phase for the proposed project. The main purpose of this scoping report is to set out all project-related environmental issues; to identify and outline what investigations need to be conducted; and to detail how these investigations will be performed. The terms of reference generated for the EIA will enable the meaningful assessment of all relevant environmental and social issues.

### **Brief project motivation (need and desirability)**

The target ore body is isolated in that its eastern extent is cut off by a fault/geological lineament. It is therefore effectively a limited extension of the current PPM pit. Given this, PPM and the IBMR (owner of the Sedibelo Mining Project) have determined that it is most effective for PPM to follow the ore body in a down dip direction and mine the ore as an extension to PPM's current open pit mine.

The mining of this area is beneficial to PPM as there is an inferred resource of 5.99million ounces. PPM has conducted a mining optimisation study that covers the proposed extension area and this has proven that the extended mine is economically viable (Cube Consulting, June 2009).

### Legal Framework

Prior to the commencement of the proposed project, environmental authorisation is required from key Government Departments. These include:

- Environmental authorisation from the North West Department of Economic Development, Environment, Conservation and Tourism (DEDECT) in terms of NEMA. The proposed project incorporates several listed environmental activities. An application was submitted by SLR to DEDECT and was accepted by the department (Appendix A). The EIA regulation being followed for this project is Regulation 543 (2010 EIA Regulations)
- An environmental decision from the Department of Mineral Resources (DMR) in terms of Section 102 of the MPRDA in the form of an approved amended Environmental Impact Assessment and Environmental Management Programme (EIA/EMP) report
- Waste license for waste-related activities from the Department of Environmental Affairs (DEA) in terms of NEMA: Waste Act, 59 of 2008. An application was submitted to DEA and was accepted by the department (Appendix A)
- A water use license application (IWULA) and Integrated Waste and Water Management Plan (IWWMP) was submitted to the Department of Water Affairs (DWA) in terms of the National Water Act (NWA) 36 of 1998 on the 4 April 2008 and this documentation is under DWA review at head office.

It is expected that any additional approvals/permits needed for the project will be identified during the course of the environmental assessment process. A detailed list will be provided in the EIA and EMP report.

This document has been prepared strictly in accordance with the DMR Scoping Report template format, and informed by the guidelines posted on the official DMR website. This is in accordance with the requirements of the MPRDA. In addition, this report complies with the requirements of the National Environmental Management Act (NEMA) (Act 107 of 1998). The relevant criteria are indicated in Table 1.

**TABLE 1: LEGAL FRAMEWORK**

Reference in Scoping Report	Mining Regulation 49 of Regulation 527 of 23 April 2004	NEMA Regulation 28 of Regulation 543 of 18 June 2010
Introduction		Details of the environmental practitioner who prepared the report, including relevant expertise to carry out scoping procedures.

Reference in Scoping Report	Mining Regulation 49 of Regulation 527 of 23 April 2004	NEMA Regulation 28 of Regulation 543 of 18 June 2010
Introduction		Identify all legislation and guidelines that have been considered in preparing the scoping report.
Section 1	Describe the methodology applied to conduct scoping.	
Section 1, Appendix B, Appendix C and Appendix D	Describe the process of engagement of identified interested and affected parties (IAPs), including their views and concerns.	Details of the public participation process conducted in terms of Regulation 28(a), including: notification of IAPs, proof of notification, IAP register/database, summary of issues raised by IAPs.
Section 2	Describe the existing status of the environment prior to the mining operation.	Description of the environment that may be affected by the activities.
Section 3.1	Describe the most appropriate procedure to plan and develop the proposed operation.	A description of the proposed activities, a description of the property on which the activity is to be undertaken, and the location of the activity on the property.
Sections 4.1 and 4.5	Identify and describe reasonable land use or development alternatives to the proposed operation. Describe the consequences of not proceeding.	A description of any feasible and reasonable alternatives that have been identified.
Section 3	Identify and describe the anticipated environmental, social and cultural impacts, including cumulative effects where applicable.	A description of the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activities. A description of environmental issues and potential impacts, including cumulative impacts.
Section 6	Describe the nature and extent of further investigations required in the environmental impact assessment report.	Information on the methodology that will be adopted in assessing the potential impacts that have been identified. A plan of study for EIA, including: tasks to be undertaken, specialist reports and processes, consultation of authorities, method of assessing environmental issues and alternatives, the option of not proceeding, proposed public participation process, other information required by the authorities.

### Scoping phase objectives

The objectives of the scoping phase are to understand the proposed project, identify and describe potential environmental and social impacts, and to set out any related terms of reference for further investigations that will enable the meaningful assessment of all relevant environmental and social issues. The terms of reference for further investigations are included in Section 6.1.

### Scoping team

SLR Consulting Africa (Pty) Ltd (SLR), previously known as Metago Environmental Engineers (Pty) Ltd, is the independent firm of consultants that has been appointed by the applicant company to undertake the environmental assessment and related processes. Hylton Allison (project manager) has approximately eleven years of relevant experience and is registered with the South African Council for

Natural Scientific Professions (SACNSP) as a professional natural scientist (PrSciNat) (Environmental Management). Alex Pfeiffer (project reviewer) has 11 years of relevant experience and is registered as a professional natural scientist (PrSciNat) (Environmental Management).

The environmental scoping team includes:

- Alex Pfeiffer – Project Reviewer
- Hylton Allison – Project Manager
- Victoria Tucker – Project Assistant
- Ntsako Baloyi – Public Consultation Assistant.

Technical input was provided by:

- Dean Riley – PPM Project Manager

Neither Hylton, Alex nor SLR has any interest in the project other than fair payment for consulting services rendered as part of the environmental assessment process.

#### Contact details for responsible persons

Aspect	Applicant
Name	Pilanesberg Platinum Mines (Pty) Ltd
Postal address	Private Bag X11 Highveld 0067
Telephone number	(012) 661-4280
Facsimile number	(012) 661-4139
Contact person/s	Mr Casper Badenhorst (On-site Mine General Manager) Mr Dean Riley (Project Manager) Ms Dimakatso Maserumule (On-site Environmental Compliance Officer)

**FIGURE 1: REGIONAL SETTING**

**FIGURE 2: LOCAL SETTING**

## 1 THE METHODOLOGY APPLIED TO SCOPING

The scoping process was conducted in accordance with the requirements of the legal framework outlined in Table 1 of the Introduction to this report and involved the following steps:

- Key team members conducted a site visit to the Pilanesberg Platinum Mine's Tuschenkomst open pit operation
- Available studies and reports covering the Pilanesberg Platinum Mine's operations were reviewed
- A project description was drafted in consultation with the client
- Potential positive and negative impacts were identified by considering the project description and site conditions
- Interested and affected parties (IAPs) were identified, notified of the proposed project and consulted (the consultation process is outlined in Section 5 of this report)
- The relevant authorities were identified, notified of the proposed project and consulted (the consultation process is outlined in Section 5 of this report)
- The SLR environmental team identified the investigations required to assess the potential positive and negative impacts (the terms of reference are included in Section 6 of this report)
- A Scoping Report was compiled.

The main sources of information used to develop this report are discussed below.

As part of the EIA and EMP reports completed for PPM, various specialist studies were commissioned to cover the proposed Tuschenkomst pit extension area. The following studies have been used to inform this report:

- AGES (October 2011): *Pilanesberg Platinum Mines – Amendment Extended Tuschenkomst open Pit post Operational Study; Report Number AS-R-2010-10-19.*
- AGES (October 2011): *Pilanesberg Platinum Mines - Tuschenkomst Pit Flooding Option Analysis; Report Number AS-R-2010-12-10.*
- AGES (October 2011): *Pilanesberg Platinum Mine - Tuschenkomst Pit Flooding Option Analysis, Engineering and Closure Scenario Analysis; Report Number AS-R-2010-12-10.*
- AGES (October 2011): *Pilanesberg Platinum Mine - Tuschenkomst Pit Flooding Option Analysis, Tuschenkomst Open Pit Post Operational Study; Report Number AS-R-2010-12-10.*
- Agricultural Research Council – Institute for Soil, Climate and Water (March 2006): *Soil survey of portions of the farms Ruighoek 169JP, Zandspruit 168JP, Rooderand 46JQ, Witkleifontein 136JP, and Tuschenkomst 135JP, near Pilanesberg for Pilanesberg Platinum Mines; Report Number GW/A/2006.*
- BPI for Palaeontological Research (May 2011): *PPM project – Palaeontological impact assessment.*



- Concession Creek Consulting (July 2011): *Amendment of the Pilanesberg Mine Environmental Programme the Tuschenkomst Open Pit Closure Project - Socio-economic Impact Assessment*
- *Cube report - Sedibelo Western Extension PGE Project - Pit Optimization, Pit Design and Production Scheduling (February 2009) (Allan Hochreiter Financial Justification as submitted in the s102 application)*
- DHI (2011): *Surface water hydrological analysis determining the surface water contributions to the mine pit in the Bierspruit River catchment in (AGES, 2011) Pilanesberg platinum mines: Tuschenkomst pit flooding option analysis; Report Number AS-R-2010-12-10.*
- Earth Science Solutions (October 2011): *Pilanesberg Platinum Mine's Tuschenkomst Pit Extension Project – Specialist Soils, land capability and land use - impact assessment and management planning.*
- Earth Science Solutions (May 2011): *Amendment of the Pilanesberg Platinum Mines EMP Closure objectives – Soils, land capability and land use specialist studies - impact assessment and management planning.*
- Epoch Resources (Pty) Ltd, (May 2011): *Pilanesberg Platinum Mines WRD - Design report and operating guidelines.*
- F le R Malherbe Pr Eng (April 2007): *Noise Impact Study for the Sedibelo Platinum Project; Report No 06/9/1 B.*
- Institute for Soil, Climate and Water (March 2006): *Soils and land capability study of the proposed project site.*
- JCCP (October 2011): *a Phase I heritage impact assessment (HIA) study for a combined platinum operation near the Pilanesberg in the North West Province - the extension of the Tuschenkomst Open Cast Pit for the Pilanesberg Platinum Mine.*
- JCCP (June 2006): *a Phase I heritage impact assessment (HIA) study for Pilanesberg Platinum mines (PPM) new proposed mining areas near the Pilanesberg in the North-West Province of South Africa.*
- Knight Piessold (Pty) Limited (August 2007): *Sedibelo Platinum Project draft flood hydrology report on behalf of Itereleng Bakgatla Minerals Resources (Pty) Ltd.*
- Metago Environmental Engineers (Pty) Ltd (April 2006): *Environmental Scoping report for a proposed platinum mine on behalf of Pilanesberg Platinum Mines (Pty) Ltd*
- Metago Environmental Engineers (Pty) Ltd (April 2007): *Environmental Impact Assessment/ Management Programme for a proposed platinum Mine on behalf of Pilanesberg Platinum Mines (Pty) Ltd*
- Metago Water Geosciences (May 2011): *Tuschenkomst ground water review; ground water report - Metago Project No. EB001-06 Report No.1; Pretoria.*
- Natural Scientific Services (November 2011): *Biodiversity assessment for the amendment of the Pilanesberg Platinum Mines EMP Closure objectives.*

- Newton Landscape Architects (June 2011): *Proposed amendment of the closure objectives of the Tuschenkomst open pit and the community water supply scheme, Pilanesberg Platinum Mine, Bojanala District Municipality, North West Province; Visual impact assessment.*
- North West Parks and Tourism Board (April 2002): *Heritage park Concept Plan second edition.*
- North West Parks and Tourism Board (August 2010): *Heritage Park – Revised implementation strategy.*
- Pilanesberg Platinum Mines (PPM) Revised Mining Work Programme (July 2010): *Supporting the section 102 application to extend PPM's mining area.*
- SLR Consulting (Pty) Ltd (January 2011): *Environmental Scoping Report for the amendment of the Pilanesberg Platinum Mines (Pty) Ltd EMP closure objectives; SLR Project No. B007-15, Report No.1 - Johannesburg.*
- SLR Consulting (Pty) Ltd (August 2011): *Environmental Impact Assessment Report for the amendment of the Pilanesberg Platinum Mines (Pty) Ltd EMP closure objectives; SLR Project No. B007-15, Report No.2 - Johannesburg.*
- SLR Consulting (Pty) Ltd (June 2011): *Calculation of the financial closure liability associated with the proposed PPM project.*
- SLR Consulting (Pty) Ltd (June 2011): *Surface water assessment for the amendment of the Pilanesberg Platinum Mines EMP closure objectives; SLR Project No. B007-21 Report No.1 - Johannesburg.*
- SRK Consulting Engineers and Scientists (July 2007): *Pilanesberg PGM Project; BFS Report.*
- Strategy4Good: Strategy and Sustainability (October 2011): *Memorandum regarding the Pilanesberg Platinum Mine's (Platmin) Proposed Tuschenkomst Pit Extension, Economic Land Use Analysis.*

In addition, the following information was used:

- DEAT (2002): *Stakeholder Engagement, Information Series 3, Department of Environmental Affairs and Tourism (DEAT), Pretoria*
- DEAT (2005): *Guideline 4: Public participation, in support of the EIA regulations; Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism, Pretoria*
- Department of Water Affairs and Forestry (1996): *South African Water Quality Guidelines (1st Ed). Volume 1: Domestic Water Use*
- Mucina, L and Rutherford, MC. (April 2006): *The vegetation of South Africa, Lesotho and Swaziland. South African National Biodiversity Institute.*
- regional geology map
- SANS 241:2006: *Drinking Water Specification, Edition 6.1.*
- SANS 10089-1:2003: *The petroleum industry – Part 1: Storage and distribution of petroleum products in above-ground bulk installations.*

- *SANS 10103: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication.*
- topographical maps for Saulspoort (1:50 000 scale);
  - 2527AA
  - 2427CC
  - 2526BB
  - 2527AB
  - 2427CD

### **1.1 HISTORICALLY DISADVANTAGED COMMUNITIES**

The historically disadvantaged communities as defined in the DMR Guideline are detailed below.

With reference to Figure 1 and Figure 2 the communities closest to the proposed Tuschenkomst/Rooderand pit extension area project area include:

Communities closest to the proposed Tuschenkomst pit extension project area include:

- livestock herders (located on the farms Wilgespruit 2JQ and Rooderand 46JQ);
- Ngweding (located 1.75 km from the project boundary on the farm Cyferkuil 1JQ);
- Legkraal (including Bofule) (located 2.3 km from the project boundary on the farm Legkraal 48JQ);
- Legkraal (including Ramasedi [previously known as Ga-Masilela]) (located 4.4 km from the project boundary on the farm Koedoesfontein 42JQ);
- Ntswana-le- Metsing (located 4.5 km from the project boundary on the farm Welgewaagd 133JP);
- Motlhabe (located 4.9 km from the project boundary on the farm Welgewaagd 133JP);
- Lekutung (located 7.6 km from the project boundary on the farm Kruidfontein 40JQ);
- Lesobeng (located 7.7 km from the project boundary on the farm Wilgespruit 7JQ);
- Lesetlheng (located 9 km from the project boundary on the farm Kruidfontein 40JQ); and
- Kgamatha (located 11 km from the project boundary on the farm Wilgespruit 7JQ).

### **1.2 HISTORICALLY DISADVANTAGED COMMUNITY LAND OWNERSHIP**

The Bakgatla-Ba-Kgafela (BBK) hold the surface rights for the project (i.e. land is held in trust for the BBK) (refer to Section 1.6).

### **1.3 DEPARTMENT OF LAND AFFAIRS INTEREST**

The farms Tuschenkomst 135JP and Magazynskraal 3JQ are owned by the Republic of South Africa (care of the Department of Rural Development and Land Reform [DRDLR], formerly the Department of

Land Affairs). As such, the DRDLR has been identified as an interested and affected party (IAP) and has been consulted. Proof of consultation is attached in Appendix C.

#### 1.4 LAND CLAIMS

SLR is not aware of a land claim on the farms Tuschenkomst 135JP and Wilgespruit 2JQ. This will be confirmed with the Department of Rural Development and Land Reform for the purposes of the EIA and EMP report.

#### 1.5 RELEVANT TRADITIONAL AUTHORITY

The Bakgatla-Ba-Kgafela is the relevant traditional authority for the proposed project area. During the public consultation process it was noted that some of the communities are challenging this leadership. In this regard, refer to Appendix C for minutes of the scoping meetings and correspondence received by SLR, and Appendix D for the Comments and Response Report.

#### 1.6 LANDOWNERS

The title deed owners are listed in Table 2 below. The surface area of the farm Wilgespruit 2JQ is held in trust by the Bakgatla-Ba-Kgafela.

**TABLE 2: LAND OWNERS IN THE PROJECT AREA**

Farm Name	Portion number	Title deed number	Surface owner as per title deeds search (February 2012)
Tuschenkomst 135JP	0	G594/1938BP	Republic of South Africa
Wilgespruit 2JQ	0	T1230/1919BP	Bakgatla-Ba-Kgafela Tribe
Rooderand 46JQ	1	T8993/1916BP	Republic of South Africa

#### 1.7 LAWFUL OCCUPIERS

The land users, farmers, farm workers, PPM and the IBMR are the lawful occupiers of the land. In addition PPM holds the mining right for the proposed Tuschenkomst Pit Extension Project area.

#### 1.8 OTHER PARTIES THAT MAY BE DIRECTLY AFFECTED

This section briefly discusses whether or not other persons (including on adjacent and non-adjacent properties) socio-economic conditions will be directly affected by the proposed mining operation.

Other affected parties that may be directly affected include the landowners and land users on the adjacent properties (as listed in Table 3 below).

**TABLE 3: LANDOWNERS ADJACENT TO THE PROJECT AREA**

<b>Farm Name</b>	<b>Portion number</b>	<b>Title deed number</b>	<b>Surface owner as per title deeds search (February 2012)</b>
Wilgespruit 2JQ	0	T1230/1919BP	Bakgatla-Ba-Kgafela Tribe
Wildebeestkuil 7JQ	0	T4278/1921BP	
Kruidfontein 40JQ	0	T4028/1898BP	
Cyferkuil 1JQ	1	T5284/1937BP	Republic of South Africa
Wachteenbeetjeslaagte 4JQ	0	T2403/1948BP	
Haakdoorn 6JQ	0	T5990/1937BP	
Koedoesfontein 42JQ	0	T5841/1919BP	Tchinangoe Pilane (1/6 share); Samuel Tilimane Pilane (1/6 share); Noel Pilane (1/6 share); and Bakgatla Tribe (3/6 share)

Other affected parties identified to date that may be affected by the project include:

- Pilanesberg National Park (including Black Rhino Game Reserve);
- North West Parks and Tourism Board (NWPTB);
- downstream water users;
- surrounding mining operations; and
- surrounding communities on non-adjacent properties (including land owners and land users).

Details on the relevant parties that will be directly affected by the proposed project will be identified during the EIA process, and the information will be included in the EIA and EMP report.

## 1.9 RELEVANT LOCAL MUNICIPALITY

The Moses Kotane Local Municipality (MKLM) is the relevant local municipality.

## 1.10 OTHER STAKEHOLDERS

The relevant government departments, agencies and institutions responsible for the various aspects of the environment, land and infrastructure that may be affected by the proposed project are listed below:

- Regulatory authorities:
  - Department of Mineral Resources (DMR)
  - Department of Environment Affairs (DEA)
  - Department of Water Affairs (DWA)

- Department of Economic Development, Environment, Conservation and Tourism (DEDECT)
- South African Heritage Resource Agency (SAHRA)
- Department of Agriculture Forestry and Fisheries (DAFF)
  - Sub-directorate Agriculture
  - Sub-directorate - Forestry
- Department of Rural Development and Land Reform (DRDLR) (Formerly Department of Land Affairs-DLA)
- Department of Public Works, Roads and Transport (DPWRT)
- North West Parks and Tourism Board (NWPTB) (Heritage Park and Ecology Departments)
- Moses Kotane Local Municipality (MKLM)
- Bojanala Platinum District Municipality (BPDM)
- Ward councillors
- Non-governmental Organisation (NGO):
  - Federation for a Sustainable Environment (FSE) (formerly North West Ecoforum)
- Parastatals:
  - Eskom
  - Magalies Water
- Other:
  - Pilanesberg National Park (including Black Rhino Game Reserve).

### **1.11 NOTIFICATION OF LANDOWNERS, LAWFUL OCCUPIERS AND IAPS**

Proof that the landowners, lawful occupiers and IAPs were notified of the project is provided in Appendix C.

## **2 DESCRIPTION OF THE EXISTING STATUS OF THE ENVIRONMENT**

This section has been compiled using studies completed by various specialists for the original EIA (Metago, 2007) and subsequent amendments of the closure objectives EIA (Metago, 2009) as well as information from the recent site visits by SLR personnel. This baseline information is aimed at giving the reader perspective on the existing status of the cultural, socio-economic and biophysical environment. Detailed information will be provided in the EIA and EMP report.

### **2.1 AGREEMENT ON EXISTING STATUS OF ENVIRONMENT**

Information on the existing status of the environment was provided to IAPs during the scoping meetings, as per the minutes attached in Appendix C. No objections were raised about the information on the existing environment, however, additional information was provided regarding land users from the various communities making use of grazing and arable land and the groundwater use by animals in the Pilanesberg National Park. IAPs will also have the opportunity to review this scoping report which includes details of the existing status of the environment.

### **2.2 EXISTING STATUS OF THE CULTURAL ENVIRONMENT**

The existing status of the cultural environment that may be affected by the proposed project is described in the section below. The term 'cultural resource' is a broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practice, belief of social interaction. They can be, but are not necessarily identified with defined locations. Heritage resources are considered to be cultural resources, therefore these resources are dealt with together in the section below.

### **2.3 EXISTING STATUS OF THE HERITAGE ENVIRONMENT**

This section describes the existing status of the heritage, cultural and palaeontological environments that may be affected by the proposed project. The various natural and cultural assets collectively form the heritage. Heritage (and cultural) resources include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

A Phase I Heritage Impact Assessment (HIA) was conducted as part of the mine's approved EIA and EMP report (Pistorius, 2006) and further HIA's were carried out by Dr. Pistorius in 2010 and 2011. The Phase I HIA did not reveal any of the types and ranges of heritage resources as outlined in Section 3 of

the National Heritage Resources Act (No 25 of 1999) for the farms Wilgespruit 2JQ and Rooderand 46JQ.

The most important heritage resources were previously (i.e. 2006) discovered on the farm Tuschenkomst 135 JP include:

- scattered stone tools and potsherds from the Stone Age and Iron Age which were rated as having low heritage significance;
- historic late Iron Age stone walled settlements on the outer edge of the Mogare and Patswane townscapes rated as having medium-high heritage significance;
- graveyards; and
- an historic homestead and scattered mining heritage remains (Metago, 2007).

It is not considered likely that paleontological resources exist within the project area due to the geology of the area (Rubidge, 2011). The project area is underlain by igneous rocks of the Rustenburg Layered Suite of the Bushveld Complex (formerly known as Bushveld Igneous Complex) that is exposed only in places. This Complex is an intrusive igneous body comprising a series of ultramafic-mafic layers and a suite of associated granitoid rocks. As these rocks are Precambrian in age and are of igneous origin and is highly unlikely that fossils will be affected by the proposed subsurface mining development. Overlying the rocks of the Rustenburg Layered suite, the entire area is covered by unconsolidated Quaternary sand deposits. These are the only sedimentary deposits in the area to be affected by mining activities, and as the deposits are not consolidated it is very unlikely that any fossils will be present.

## **2.4 EXISTING STATUS OF THE SOCIO-ECONOMIC ENVIRONMENT**

This section describes the existing status of current land uses and the socio-economic environment that may be affected by the proposed project.

### **2.4.1 CURRENT LAND USES AND THE SOCIO-ECONOMIC ENVIRONMENT**

The relevant land uses and socio-economic factors that may be affected are listed below, and the socio-economic environment is detailed in Section 2.4.4:

- subsistence agriculture (livestock grazing and crops); and
- informal residential (livestock herders and farmers).

Persons on the relevant properties and surrounding properties may be impacted upon by the proposed project. The potential positive and negative impacts are described in sections 3.11 of the scoping report.



## 2.4.2 MINERAL/PROSPECTING RIGHTS

PPM initially held new order prospecting rights (details of those rights are given in Table 4):

**TABLE 4: MINERAL TITLE HOLDINGS OF PILANESBERG PLATINUM MINES (PTY) LTD (SRK, BFS REPORT 2007)**

Property	Portions	Hectares	Mining Right	Prospecting Right	Company Holding the Right	
Rooderand 46JQ (State)	3	534.5988	NW 30/5/1/2/2/320 MR (39/2008)	NW 30/5/1/1/2/23 PR [320/2002 (Converted)]	Pilanesberg Platinum Mines (Pty) Ltd, previously Taung Minerals (Pty) Ltd	
Ruighoek 169JP	1 (Originally comprising RE1, 10-14)	1685.74		NW 30/5/1/2/2/320 MR (39/2008)	NW 30/5/1/1/2/24 PR [228/2002 (Converted)]	Pilanesberg Platinum Mines (Pty) Ltd,
	2	391.3166				
	3	130.4399				
	4	130.4399				
	6	130.4384				
	9	120.1600				
Tuschenkomst 135JP	Farm	1372.13	NW 30/5/1/1/2/25 PR [321/2002 (Converted)]	Pilanesberg Platinum Mines (Pty) Ltd, previously Taung Minerals (Pty) Ltd		
Witkleifontein 136JP	1+ RE	1370.938			NW 30/5/1/1/2/26 PR [67/2002 (Converted)]	Pilanesberg Platinum Mines (Pty) Ltd, previously Taung Minerals (Pty) Ltd

PPM has subsequently converted its prospecting rights into a new order mining right through a mining right application process (NW30/5/1/2/2/320MR). The mining right covers “PGM’s” and “Balance of Minerals” (DMR reference number NW30/5/1/2/2/320MR.) for the Tuschenkomst 135JP and other deposits.

For the current project, PPM and the Itereleng Bakgatla Minerals Resources (Proprietary) Limited (IBMR) have reached an agreement. As part of the current process, PPM has applied to take over the mining rights on the project site (i.e. Mining Right Abandonment Area). This will position PPM strategically to mine the ore body within the abandonment area.

### 2.4.3 PRE-PROJECT LAND USE

The area around PPM is rural and densely settled in places with the main land uses including residential areas, subsistence dry land agriculture, small-scale commercial agriculture and communal livestock grazing. PPM is also surrounded by mining operations, conservation and eco-tourism activities (associated with private land and the Pilanesberg National Park).

The area for the proposed extended pit and associated surface infrastructure is currently incorporated within the Sedibelo Mine mining right area. However agricultural activities (grazing, subsistence cropping) are still conducted on the relevant farms.

### 2.4.4 SOCIO-ECONOMIC PROFILE

The regional setting is illustrated in Figure 1 and Figure 3. Information provided below is based on the 1996 and 2001 census data from Statistics South Africa (Stats SA) and 2009/2010 Quantec Data (Quantec Research (Pty) Ltd).

#### 2.4.4.1 Provincial Level – North West Province

- **Population** – The North West Province has a population of approximately 3.2 million residents (Stats SA, 2001), with an average household size of 3.6.
- **Economic Activity** – Provincially it was estimated that, in 2009, the most dominant sector contributing to the North West Province's economy was the Mining industry. This was demonstrated by 25% of the economically active population<sup>1</sup> being employed in this industry. The sectors with the smallest contributions to the province's Gross Geographic Product (GGP) were Electricity and Water, as well as the Transportation industry.
- **Unemployment** – It was estimated that the unemployment rate of the North West Province in 2009 was 26% (presenting a similar profile to South Africa as a whole – with an unemployment rate of 25% in the same year).
- **Education** – Ten percent of the working age population has had no formal education. Furthermore, only 18% of the total population in the province obtained a grade 12/matric education.
- **Basic Services** – The majority of the population's households have access to piped water, with only eight percent using alternate water sources (for example, boreholes, water vendors, wells, tankers, dams, rivers, streams). Approximately 46% of households with toilet facilities utilise pit or bucket latrines. Eight percent have no toilet facilities. In terms of households' dominant energy source, 86% use electricity as the primary means for lighting. Refuse removal services are provided to most

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<sup>1</sup> *Economically active population*: consists of both those who are employed and those who are unemployed (as defined by Statistics South Africa) within the *working age population* (includes all those aged between 15 and 65).

households, with a small percentage of the population (an estimated nine percent) not having any refuse disposal facilities.

- **Housing** – Within the North West Province, it is estimated that 22% of the population reside in informal dwellings (with 15% of the population living in informal settlements and seven percent in backyards).
- **HIV Status** – Those with a tested HIV positive status account for approximately 13% of the North West Province population. In 2010, one percent of the entire province's residents died of AIDS related illness.

#### 2.4.4.2 Municipal Level – Moses Kotane Local Municipality (MKLM)

- **Population:** Approximately 100 000 people reside in the MKLM area. Of this approximately 80% are of a working age between 19 and 65 years and 17% are below 19 years.
- **Education:** As is the case for the province, the local level of education in the people that comprise the workforce age (19 to 65 years) is poor. Of these people only 18% have completed secondary education and only 6% have received education higher than secondary level.
- **Economy/employment:** Excluding the informal sector, the unemployment/not economically active rate is high at an estimated 75% of the economically active age. Mining, construction and the wholesale retail trade are the major employment providers. Income statistics indicate that 52 % of the working population receive under R1 600 per month and 40% receive between R1 600 and R6 400 per month.
- **Housing and services:** 75% of residents reside in brick structures but only 9% of residents of the 75% utilise flush toilets and only 8% receive reticulated water in their dwellings.

#### 2.4.4.3 Local Level – Local Villages

This information is relevant to Motlhabe, Ntswana-Le-Metsing, Ngweding and Legkraal/Bofule. Information on the broader community network will be included in the EIA and EMP report.

- **Population:** Approximately 6000 people reside in the villages surrounding the proposed project. It is estimated that 58% of the population is of working age (between 19 and 65 years).
- **Education:** Compared to provincial and local municipality figures, the local level of education in the people that comprise the workforce age (19 to 65 years) is poor with only 4-5% of people with education levels higher than secondary level and only 18% of people having completed secondary education.
- **Economy/employment:** Excluding the informal sector, the unemployment and/or not economically active rate is high at an estimated 80% of the economically active age. Mining is considered to be the major formal employment provider. Income statistics indicate that 3% of households received no income, 69% of households received less than or equal to R1600 per month, and between 28% of households received between R1601 and R6400 per month.

- **Housing and services:** 89% of residents reside in brick structures, but only 1% of residents of the 89% utilise flush toilets and only 1% receive reticulated water in their dwellings.

#### 2.4.4.4 Local level (Tuschenkomst Pit Extension project site)

The Tuschenkomst Pit Extension project site population is characterised by farmers and farm workers located on the project area. No dwellings or inhabitants were observed on the project area. The majority of Tuschenkomst 135JP is still currently used for grazing and a smaller proportion has been taken for mining. Rooderand 46JQ Portion 1 is still used for grazing purposes and a portion of this will be used for mining. A survey will be conducted to determine the number of people allocated and utilising the relevant farms within the project area and what basic services they have access to. More information will be provided in the EIA in this regard.

## 2.5 EXISTING STATUS OF RELEVANT INFRASTRUCTURE

This section describes the existing status of any infrastructure that may be affected by the proposed project.

### 2.5.1 COMMUNITIES AND COMMUNITY STRUCTURES IN THE VICINITY

Various informal homesteads are located within and adjacent to the Tuschenkomst extended pit project area.

Formal villages surrounding the proposed project area include:

- livestock herders (located on and adjoining the project area);
- Ngweding (located 1.75 km from the project boundary on the farm Cyferkuil 1JQ);
- Legkraal (including Bofule) (located 2.3 km from the project boundary on the farm Legkraal 48JQ);
- Legkraal (including Ramasedi [previously known as Ga-Masilela]) (located 4.4 km from the project boundary on the farm Koedoesfontein 42JQ);
- Ntswana-le-Metsing (located 4.5 km from the project boundary on the farm Welgewaagd 133JP);
- Motlhabe (located 4.9 km from the project boundary on the farm Welgewaagd 133JP);
- Magalane ( $\pm 7$  km north of the project boundary on the farm Rhenosterkraal 132JP);
- Lekutung (located 7.6 km from the project boundary on the farm Kruidfontein 40JQ);
- Lesobeng (located 7.7 km from the project boundary on the farm Wilgespruit 7JQ);
- Magong ( $\pm 8$  km north east of the project boundary on the farm Rhenosterkraal 132JP);
- Lesetlheng (located 9 km from the project boundary on the farm Kruidfontein 40JQ);
- Kgamatha (located 11 km from the project boundary on the farm Wilgespruit 7JQ)
- Saulspoort/Moruleng ( $\pm 14.5$  km south east of the project boundary);
- Manamakgoteng ( $\pm 16$  km east of the project boundary on the farm Modderkuil 39JQ);
- Mononono ( $\pm 17$  km north east of the project boundary); and

- Sefikile ( $\pm$  18 km north east of the project boundary).

### 2.5.2 OTHER MINING OPERATIONS IN THE VICINITY

Various other mining operations are located in the immediate vicinity of the proposed project and include:

- Sedibelo is situated on the farms Wilgespruit 2JQ, portion 1 of Rooderand 46JQ, Legkraal 45JQ and Koedoesfontein 42JQ;
- PPM has the following interests on the following farms;
  - Portion 3 of Rooderand 46 JQ: platinum group metals, gold, nickel, copper, cobalt, chrome and other metals associated therewith;
  - Portions 1-4, 6, 9 and 15 of Ruighoek 169 JP: all minerals excluding chrome;
  - Tuschenkomst 135 JP: platinum group metals , gold, nickel, copper, cobalt and other metals associated therewith<sup>2</sup>; and
  - Portions 1 and RE of Witkleifontein 136 JP: all minerals.
- Chrometco chrome mine is situated on portion 2 and R/E of the farm Rooderand 46JQ.

Additional proposed mining interests in the immediate vicinity include:

- Platinum Australia (Atla Mining), situated on portion 2 of Rooderand 46JQ;
- Nkwe Platinum (portion RE of Rooderand 46JQ).

Other mining operations located further afield include:

- Rustenburg Minerals on the farm Groenfontein 138JP;
- Chrome Corporation on the farm Ruighoek 169JP;
- Merafe - Xstrata Horizon Mine on the farms Ruighoek 169JP and Vogelstruisnek 17JP.

### 2.5.3 RECREATIONAL FACILITIES WITHIN THE VICINITY

Recreational facilities within the vicinity include:

- Pilanesberg National Park located immediately south of the project area;
- Black Rhino Private Game Reserve has been incorporated into the Pilanesberg National Park and is situated on the farm Zandspruit 168JP;
- Ivory Tree Lodge in the Pilanesberg National Park;
- the Lebatlhane Nature Reserve located to the north of the project area;
- BBKTA cultural museum based in Saulspoort/Moruleng;
- Sports centre located in Saulspoort/Moruleng
- Sun City, which lies on the southern edge of the Pilanesberg National Park, approximately 25 km south of the proposed site;

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<sup>2</sup> The chrome minerals situated on Tuschenkomst property are the subject of a section 102 application that PPM has submitted to the DMR.

- Madikwe Game Reserve lies approximately 60 km to the north west of the proposed site;
- further afield there are a number of hotels, restaurants and sporting facilities located in and around the outskirts of Phokeng and Rustenburg some 60 km to the south of the proposed project site.

#### **2.5.4 PROPOSED HERITAGE PARK CORRIDOR**

The proposed heritage park corridor (HPC) is an initiative being put forward by the NWPTB where it is proposed that over 167 000 ha will be incorporated into the corridor over a 20 year period to allow the joining of the Madikwe Game Reserve and the Pilanesberg National Park. This is a piece of land that stretches north of the Pilanesberg towards Dwaalboom and then follows the Dwarsberg Mountain range west before joining the Madikwe Reserve at Molatedi. This initiative forms part of a larger initiative to establish a significant conservation area in the province approaching 1 000 000 ha. The proposed concept will be to establish a core corridor that would have the potential to be expanded over time to increase the nature based tourism to the area and thus increase the socio-economic benefits to the area (NWPTB, 2002).

As part of the HPC, two different corridors are planned. The phase 1 corridor is the wider corridor which will be fenced off to contain non-dangerous game on the farms that form part of the southern part of the proposed Heritage Park. It is planned that non-dangerous game, community activities and mining activities would co-exist within this corridor. The phase 2 corridor is likely to be a narrower “Big Five” corridor that will be used exclusively for animal movement between Pilanesberg National Park and Lebatlhane Game Reserve (and ultimately the Madikwe Game Reserve), and it will exclude community and mining activities.

#### **2.5.5 TRANSPORT INFRASTRUCTURE**

A network of roads exists in the project area (refer to Figure 3). These include:

- the regional tarred R510 (along the eastern boundary of the Pilanesberg National Park);
- the provincial tarred P54-1 (along the western boundary of the Pilanesberg National Park);
- the provincial P50-1 (east / west alignment and connects the R510 to the P54-1);
- the D511 gravel road (north-west / south-east alignment that connects the P50-1 to Magong);
- the D531 gravel road (between Motlhabe and Ntswana-le-Metsing); and
- the Z536 gravel road running south from Ngweding (a section of this road has been closed due to PPM's open pit mining operation. There is a temporary fire break road that follows the eastern boundary of PPM's pit. PPM has applied for and been granted permission to close the Z536 gravel road and construct a new road along the northern boundary of the farm Wilgespruit 2JQ [Metago, 2009]).

## 2.5.6 POWER LINES AND TELECOMMUNICATIONS

A significant power line (and the associated ESKOM servitude) crosses through the project area in a north-south direction and to the west of the Tuschenkomst open pit (refer to Figure 2). There is a network of low voltage power lines and telephone lines which service the area. These lines usually follow roads before branching off to individual properties. In the vicinity of the project site, there is a low voltage line which follows the route of the P54-1. In the vicinity of the Magazynskraal project site, there is a low voltage line that follows the internal road network on the farm Magazynskraal 3JQ.

## 2.5.7 WATER PIPELINES

There is a Magalies Water pipeline that crosses the proposed project area in an east/west direction. The pipeline originates from the Vaalkop Dam and follows the alignment of the Rustenburg – Northam tarred road (R510).

At the turn-off to Sefikile (west) the pipeline is directed west at the “padda” junction. The water pipeline is aligned along the tarred road initially. Once the road ends, the pipe then follows the northern boundaries of the farms; Cyferkuil 6JQ, Wildebeestkuil 7JQ, Magazynskraal 3JQ, Wilgespruit 2JQ and finally the eastern boundary of the farm Tuschenkomst 135JP in a northerly direction to the Tuschenkomst Reservoir.

From the reservoir water is piped to the PPM plant and back to Wilgespruit and Magazynskraal reservoir in two separate outward water pipelines.

## 2.6 EXISTING STATUS OF THE BIOPHYSICAL ENVIRONMENT

This section describes the existing status of the biophysical environment that may be affected by the proposed project.

### 2.6.1 GEOLOGY

The project site is situated in the Bushveld Complex. The Bushveld Complex is an intrusive igneous body, extending about 400 km from east to west and about 350 km from north to south. It comprises a series of ultramafic-mafic layers and a suite of associated granitoid rocks. There are four main limbs to the complex, namely the Northern Limb, the Eastern Limb, the Southern Limb and the Western Limb. Sedibelo is located in the Western Limb. The target ore body for the proposed project is the Merensky and UG2 reefs.

The ultramafic-mafic rocks of the Bushveld Complex are known as the Rustenburg Layered Suite. The stratigraphy of the Rustenburg suite is summarised as follows:

- Upper zone consisting of norites, gabbros and diorites, magnetite seams.
- Main zone consisting of norites and gabbros.
- Critical zone consisting of pyroxenites, norities and anorthosites. It is within this layer that the platinum group metals are found.
- Lower Zone consisting of pyroxenities and harzburgities, chromitite seams.
- Marginal zone consisting of pyroxenites and norites.

## 2.6.2 TOPOGRAPHY

The topographic relief of the project area can be described as relatively gently sloping towards the north-east of the study area. Topographic elevation varies between 1060 to 1100 metres above mean sea level (mamsl). The study area is relatively flat, at an average elevation of 1080 mamsl and there are various non-perennial drainage lines crossing the site (see Figure 2). The Pilanesberg Mountains are located south of the proposed project site and together with the associated hills vary in height between 1 330 and 1 534 mamsl. Isolated koppies are located approximately 1-2 km to the west of the project site and vary between 1 211 and 1 266 mamsl.

## 2.6.3 CLIMATE

### 2.6.3.1 Regional climate

The project area falls within the Highveld Climatic Zone, as defined by Schulze (1974). The average annual precipitation ranges from 500mm to 700mm (WRC, 1994). Rainfall is generally in the form of thunderstorms. These can be of high intensity with lightening and strong gusty south-westerly winds. Hail frequency is high, tending to occur 4-7 times per season. Temperatures in this climatic zone are generally mild, but low minima can be experienced in winter due to clear night skies. Frost characteristically occurs in the winter months. Generally winds are light, but south-westerly winds associated with thunderstorms are typically strong and gusty.

### 2.6.3.2 Weather stations

The nearest weather stations are in the Pilanesberg area, situated approximately 20km south east of the project area. Details of the weather stations are included in Table 5 below.

**TABLE 5: SOUTH AFRICAN WEATHER SERVICE STATIONS IN THE VICINITY OF THE PROJECT**

	South Africa Weather Stations			
	Pilanesberg A*	Pilanesberg B*	Pilanesberg - Pol	Saulspoort
Station number	0548290 7	0548375 A4	0548165 W	0548280 W
Latitude (South)	25° 20'	25° 15'	25° 14'	25° 09'
Longitude (East)	27° 10'	25° 13'	27° 06'	27° 10'
Elevation (mamsl)	1 043	1 085	1 280	1 095
Length of data record	1961 to 1990	1993 to 2007	79 years	38 years



available	(Rainfall, temperature and humidity data available)	(Rainfall data available)	(24 hr rainfall and evaporation data available)	(Evaporation data available)
Elevation difference based on the mean 1 060 mamsl for the site	-17m	-25m	+220m	-35m
Distance and direction from the site	±25km south east	±20km south east	±15km south	±9km south east

\* For this report, the two Pilanesberg stations have been labelled A and B for easy reference.

### 2.6.3.3 Rainfall and evaporation

Average rainfall data was sourced from three South African Weather Service stations mentioned above, namely Pilanesberg A (Station No. 0548290 7), Pilanesberg B (Station No. 0548375 A4) and Pilanesberg–Pol (Station No. 0548165 W).

Over the last seven year period, 1989 recorded the highest rainfall in a year with 630mm while the lowest of 429mm was recorded in 1985. The majority of the rainfall is during the summer months of October to March at which time approximately 90% of the annual rainfall occurs.

Evaporation figures recorded for the area are high and indicate that the area is a water deficit area. The average annual evaporation is 1990 mm. Potential evaporation figures, therefore, exceed the mean annual precipitation (630 mm) by 1 360 mm.

### 2.6.3.4 Temperature

Temperatures in the region tend to be warm to mild, with average maximum temperature of 27.9<sup>0</sup>C and an average minimum temperature of 11.8<sup>0</sup>C. Records from the Pilanesberg A Weather Station (Station No. 0548290 7) show that the area has experienced a maximum of 39.5<sup>0</sup>C in summer and a minimum of -5.0<sup>0</sup>C in winter over the last seven years the station was operational (1984 – 1990).

### 2.6.3.5 Wind

The predominant wind direction in the project area is from the south-south east. The general prevailing wind field is from the eastern sector, with less frequent winds from the south western and north western sectors. Calm conditions (wind speeds below 1 m/s) are predicted to occur for approximately 15% of the time (Airshed Planning Professionals [Pty] Ltd as cited in Metago, 2009).

During the day-time, winds from the north eastern sector are more frequent, while at night-time, winds from the south eastern sector increase with winds from the south-south east occurring for more than 15 % of the time. The day and night-time wind fields reflect the topographical induced flow patterns. The differential heating of slopes gives rise to anabatic (up-valley) flow during the day (increase in frequency of winds from the north-eastern sector) and katabatic (down-valley) flow during the night (increase in frequency of winds from the south-eastern sector).

Airflow varies significantly as the seasons change. The wind flow during the summer months is dominated by winds from the north- northeast with the flow associated with a high frequency of low to moderate wind speeds (1-5 m/s). During autumn, a distinct shift in the prevailing airflow from summer is noted with winds being mainly from the south eastern sector. The predominant winds during winter are from the south-south east, and during spring the predominant winds are from the easterly sector.

#### 2.6.4 SOIL AND LAND CAPABILITY

Information in this section was sourced from the soil and land capability study conducted by Earth Science Solutions (ESS) for the original EIA in 2007 (ESS, 2007).

A variety of soil forms have been identified on the project site. The distribution of soils on the site is predominantly associated with the surrounding parent host material (geology) from which they are derived and less by the surface topography.

The soils mapped, range from shallow sub-outcrop and outcrop to deep sandy clay loams together with moderately shallow to shallow gleycutanic or vertisols. As with any natural system, the transition from one system to another is often complex with multiple facets and variations that vary and grade over large distances. Four broad soil groupings were identified on the project site:

- **Structured soils**

These soils are generally deep to moderately shallow, (apedel to strong blocky/ pedocutanic to prismaeutanic) fine to medium grained sandy to silty clay loams that are associated with the development of the in-situ materials.

Associated with these structured soils is a calcareous evaporite layer that is occasionally found occurring as sub outcrop or at surface associated with the undulating disconformities that form the base to the soil profile where the geology is close to surface.

These zones comprise some of the better land capability units in the area, with the soil water holding capability and associated clay content rendering the soils capable of sustained moderate vegetative growth through the dry spells that characterise this semi-arid environment. This grouping includes neocutanic soils, red to red brown in colour with moderately strong structured (weak blocky to strong blocky) and small but significant areas of neocarbonate and soft carbonate soils with varying depths of weakly structured to apedel sandy loams along with the prismaeutanic and pedocutanic forms and less structured sandy loams. The main soil forms include; (Hutton [Hu]. Valsrivier [Va], Swartland [Sw] and Sterkspruit [Ss] forms).

- **Shallower soils**

These shallower soils are associated almost exclusively with the outcropping of the mineralised zone and host lithologies at surface. These areas form a relatively small percentage of the overall area of study. This group of soils occupy the upper and upper midslopes and for the most part have been eroded of any utilisable soil materials typically, Mayo [My], Glenrosa (Gs) and outcrop).

- **Highly structured clay soils**

The gleycutanic and vertic forms soils are prominent in the area of study, often referred to as “cotton soils or black tuffs” these materials are very clay rich, poorly drained, highly structured (vertic), and generally associated with the colluvial derived environment that occupies the midslopes (sometimes) and lower midslopes just upslope of the wet based soils (Arcadia [Ar], Kroonstad [Kd], and Rensburg [Rg]).

- **Wet soils**

These are often associated with the wetland environment, and only classify as wetlands if associated with classic wetland ecology. These soils are found almost exclusively within the depositional environment, and vary in both texture and structure from loss and friable sandy loams to highly structured clay and gleycutanic forms. These soils include the classic Avalon [Av], Bonheim [Bo], Bloemdal [Bd], Inhoek [Ik], Sepane [Se] and Kroonstad [Kd] forms.

With regard to land capability, ESS (ESS, 2011) found the following:

- 0.3% of the project site is considered to be of an arable land capability however the low rainfall in this region limits the utilisation potential to low intensity grazing and wildlife conservation. Although these areas have deep soils, irrigation would be needed to realise the arable potential of these soils.
- 52.2% is considered to be of a conservation/wilderness land potential.
- 24% is considered to be of a low intensity grazing land potential (based on the shallower depth of materials alone). When considered with the discussion above, the conservation/wilderness/low intensity grazing land potential covers the majority of the study area.
- Wet soils make up approximately 21.5% of the study area. Although these soils fall under the definition of wetland land capability (when using the Chamber of Mines classification - 1991), they are only classified as this based on the soils present and their ability to hold water for short periods of time.
- Collectively, the dams and rivers in the area cover approximately 2% of the land area surveyed.

Of the area within the Tuschenkomst WRD area, approximately:

- 30% low arable potential due to the current natural conditions i.e. fertile clays in un watered state;

- 50% low arable potential however the soils contain less clays and are easier to cultivate but do get waterlogged in summer;
- 20% grazing potential due to the shallow nature of the soils around the koppies

### 2.6.5 FAUNA (NATURAL ANIMAL LIFE)

Information in this section was sourced from an ecological assessment conducted by Natural Scientific Services (as cited in Metago, 2007) and the biodiversity specialist studies (Natural Scientific Services cc 2006, 2007 and 2011).

Over 110 faunal species were determined to potentially occur on and adjacent to the site. While the presence of only a few of these could be confirmed, the close proximity of the site to Pilanesberg Nature Reserve suggested that many more species actually occur here. Furthermore, the site's position within the proposed Heritage Park Corridor between the Pilanesberg and Madikwe Nature Reserves suggested an even greater diversity of faunal species to potentially occur in the area.

The following Red Data species were identified as occurring or likely to occur on site:

**TABLE 6: RED DATA SPECIES**

Endangered	Vulnerable	Near Threatened	Critically endangered
<b>Mammals</b>			
Tsessebe	Cheetah	Honey Badger	Short-eared trident bat
White-tailed Mouse	Ground Pangolin	Serval	
African Wild Dog	Blasius's horseshoe bat	Brown Hyena	
		Spotted Hyaena	
		South African Hedgehog	
<b>Birds</b>			
Saddle-billed Stork	Lappet-faced Vulture	Lanner Falcon	
	Kori Bustard	Black-winged Pratincole	
	Bateleur	Yellow-throated Sandgrouse	
	African Grass Owl		
<b>Snakes and Amphibians</b>			
		Giant Bullfrog	
		Striped Harlequin Snake	

## 2.6.6 FLORA (NATURAL PLANT LIFE)

Information in this section was sourced from an ecological assessment conducted by Natural Scientific Services (as cited in Metago, 2007) and the biodiversity specialist studies (Natural Scientific Services cc 2006, 2007 and 2011).

The vegetation within the study area is relatively homogenous and disturbed with more diverse mountain vegetation located on the western (Mabeskraal Ridge Habitat) and southern (Pilanesberg Mountain Bushveld) boundaries. The study area is divided into three main habitat or vegetation types – the Acacia Savanna, Acacia-Grewia mixed Savanna and the Riparian zones (Wits Enterprise, 2007).

These communities are discussed in detail below:

- **Vegetation community 1: Acacia Savannah on Black Turf Soils**

This habitat type is in the majority and dominates the northern section of the site and this habitat type typically occurs along the western bank of the main Wilgespruit channel. The vegetation structure is a mixed bushveld where *Acacia karroo* (Sweet-thorn) and *Acacia nilotica* (Scented – pod thorn) *Acacia tortilis* (Umbrella Thorn) and *Acacia caffra* (Common hookthorn) are the dominant species in the tree layer and *Ischaemum afrum* (Turf Grass); *Digitaria eriantha* (Finger Grass); *Aristida congesta subsp congesta* (Tassel Three – lawn); *Eragrostis curvula* (Weeping Love Grass); *Eragrostis superba* (Saw - tooth Love Grass); *Aerva leucura* (Amber bush) and *Polygala hottentotta* (Small Purple Broom) species dominated the herbaceous layer (NSS, 2007).

- **Vegetation community 1: Acacia Savannah's in Recovery from Past Farming**

Within the study area crop farming has been extensive (over 30% of the study area) and scattered within all the different habitats, including the Acacia Savanna. However, almost 70% of these cropping areas are within a phase of recovery. There were two main recovery groupings that were identified:

1. Initial Recovery Phase (Recent farming activities) – limited tree cover and herbaceous layer dominated by pioneer species such as *Aristida congesta* (Tassle grass); *Aristida scabrivalvis* and *Aristida bipartite*.
2. Late Recovery Phase (Past farming activities) – Dense tree layer dominated by Acacia species as well as a more diverse (although still limited in comparison to the 'intact' natural areas) herbaceous layer.

Species within these areas included mainly *Acacia karroo* (Sweet – thorn); *Acacia nilotica* (Scented - pod Thorn) and *Acacia tortilis* (Umbrella Thorn) in the tree layer and *Aristida* species (mentioned above); *Eragrostis curvula* (Weeping Love Grass), *Cynodon dactylon* (Couch Grass) and *Digitaria eriantha* (Finger Grass) in the herbaceous layer.

Current farming activities are limited and include cropping and livestock grazing.

- **Vegetation community 2: *Acacia-Grewia* Mixed Savannah on red soils - Pilanesberg Wash**

This, the second most dominant habitat, is restricted to the soils typical of that emanating from Pilanesberg National Park (known locally as Pilanesberg Wash) and is located along the eastern stretch of the Wilgespruit and the south and central areas of the study area.

The tree layer is dominated by species such as *Acacia caffra* (Common hookthorn); *Acacia mellifera* (Black Thorn); *Acacia erubescens*; *Acacia tortilis* (Umbrella Thorn); *Boscia albitrunca* (Shepherd's Tree); *Grewia flava* (Raisin Bush); *Grewia bicolor*; *Carrisa bispinosa* (Num – Num); *Dichrostachys cinerea* (Sickle Bush); *Diospyros lycioides* (Transvaal Bluebush) and *Rhus leptodictya* (Mountain Karee); *Ehretia rigida* (Puzzle – bush).

The under storey further adds to this diversity in the form of shrubs and smaller trees such as *Grewia flava* (Raisin Bush); *Carrisa bispinosa* (Num–Num) and *Dichrostachys cinerea* (Sickle Bush). While the herbaceous layer close to the main channel contains the dominant species *Borithrochloa insculpta* (Pinhole Grass) as well as *Bothriochloa radicans* (Stinking Grass), other species adding to a more diverse habitat include *Digitaria eriantha* (Finger Grass); *Eragrostis superba* (Saw-tooth Love Grass); *Melinis repens* (Natal Red Top) and *Themeda triandra* (Red Grass).

The alien species found bordering the dams in the area have also colonised the drainage line crossings.

In terms of Conservation Important Species (CIS), the Declining *Crinum bulbispermum* (Orange River Lily) was located at a number of points along the western section of the Wilgespruit.

- **Vegetation community 3: *Combretum erythrophyllum* riparian woodland**

The main area along the Wilgespruit, containing a riparian type habitat, is within the southern section of the project site and also within the foot print of the proposed pit extension. The main river system and associated drainage lines exists within the southern portion of the site and divide the two Acacia habitats. The systems are largely impacted on by the presence of cattle and crop farming. In some areas crops have been planted and harvested within these systems. Cattle's grazing has impacted on the vegetation, specifically around the dams and crossings causing erosion gullies.

Species are diverse and the tree layer resembles a 'closed woodland' with a higher canopy than the surrounding Acacia Savannah. This layer is mainly dominated by *Searsia lancea*, (Karee), *Combretum erythrophyllum* (River Bushwillow) and *Ziziphus mucronata* (Buffalo Thorn) with an under storey mainly consisting of grass species such as *Setaria sphacelata* (Golden Setaria), *Panicum maximum* (Guinea Grass), *Bothriochloa radicans* (Stinking Grass), *Themeda triandra* (Red

Grass) and *Digitaria eriantha* (Pangola Grass). Shrub species include *Hibiscus calyphyllus* (Sun Hibiscus), *Sida pseudocordifolia* (Flannelweed), *Asparagus laricinus* (Katdoring) and *Grewia flava* (Velvet Raisin).

- **Vegetation community 4: Ephemeral river wetland and open acacia savannah**

On Tuschenkomst 135JP adjacent to the western toe of the Tuschenkomst WRD the habitat types represented include flat savanna (to the west), large rocky outcrops/hills (to the north and south), low lying areas disturbed by excessive cattle grazing (to the west) and a non-perennial water course that flows in a south north direction to the west of the WRD.

#### Red Data species

According to the South African Threatened Species Programme (January 2007), two Red Data Least Concern (LC) species were recorded on site, namely *Aloe zebrina* and *Hypoxis hemerocallidea*.

#### Protected species

A number of Protected Species in accordance with the Transvaal Nature Conservation Ordinance (Ordinance 12, 1983) (TNCO) were located within the study area. In terms of Proclamation 22 of 31 March 1995, this legislation is still applicable in the northern provinces including the North West Province. A Protected Tree (PT) species, as published in the Government Gazette No. 29062, Notice 897, 8 September 2006, was also identified within the vicinity of the study area. Permits are required to remove or translocate any protected species.

Protected species found on site include:

- *Crinum bulbispermum* (Orange River Lily);
- *Crinum* (possibly) *paludosum* (Bushveld Vlei Lily);
- *Gladiolus spp*;
- *Gladiolus antholyzoides*; and
- *Orbea lutea*.

## **2.6.7 HYDROLOGY (SURFACE WATER)**

The information in this section was sourced mainly from the approved EIA and EMP (Metago, 2007), the approved EMP (Knight Piesold, 2007), the specialist hydrological study (Metago, 2011) and (DHI, 2011 in AGES, 2011).

### **2.6.7.1 Drainage and water resources**

The site falls into the upper reaches of quaternary catchment A24D of the Crocodile River. The non-perennial stream that drains the majority of the site is the Motlhabe which is a tributary of the perennial stream Kolobeng. The non-perennial Manyedime and Wilgespruit drains the Tuschenkomst area towards

the north and northeast respectively. The Manyedime is a tributary of the Kolobeng and the Wilgespruit is a tributary of the Bofule. All the water courses are non-perennial, flowing for a few days only after heavy rainfall periods.

The current mining operation and areas considered in this project fall at the headwaters of Quaternary Catchment A24D. There is a non-perennial stream, the Motlhabe which flows through the current mining area and flows into the Kolobeng just downstream of the current operation. Majority of the site drains to this Motlhabe stream. The Wilgespruit flows through the eastern corner of the current mining operation where it is currently diverted around the open pit to ensure the safe continuation of mining. The Wilgespruit joins the Bofule stream approximately 5km downstream of the current operation. As for the Motlhabe, the Bofule also flows into the Kolobeng.

### **2.6.7.2 Surface water quality**

The Wilgespruit and Moswa Rivers are dry for most of the year; therefore water quality was sampled in the Bofule Dam during October 2006 and March 2007 EIA (Knight Piesold, 2007).

The water quality generally reflects fluoride, manganese, aluminium and iron concentrations elevated above the recommended DWAF domestic use guidelines (DWAF Water Quality Guidelines, 1996). A tributary of the Motlhabe River (on the farm Witkleifontein) reflects poorer water quality in that iron, aluminium and fluoride concentrations are above the recommended domestic and agriculture (livestock watering) guidelines (Metago, 2007).

The water quality of the Kolobeng and the Wilgespruit Rivers is generally good, however as discussed above, this surface run-off does contain dissolved elements from the underlying geology within the Pilanesberg mountain range (Metago, 2007 and Metago 2011) (AGES, 2011).

### **2.6.7.3 Surface water users**

Upstream, on site and downstream water use is mainly for game and for livestock watering. There is no significant reliance for community consumption because of the fact that the watercourses are dry for most of the year.

Surface water run-off and the Wilgespruit are currently diverted around the current Tuschenkomst open pit. The water which is diverted to the east of the pit joins the run-off from the Pilanesberg Mountains, this flows into the non-perennial streams and eventually joins either the Wilgespruit or the Bofule Rivers. In this area the local farmers and cattle herders have built dams to retain some of this run-off. As this is a semi-arid area, there are few other reliable surface water features that occur on the site or in the surrounding area.



Surface water use downstream of the study area is expected to be limited due to the ephemeral nature of drainage lines.

#### **2.6.7.4 Wetlands**

The river systems on both sites are non-perennial and ephemeral, however the potential for wetlands still exist according to the Metago Report 2007. These wetlands exist particularly after heavy rains. Therefore potential wetlands are predicted to occur along the length of the entire river systems within the project site, including:

- The main channel and a tributary of the Wilgespruit on Rooderand 46JQ;
- a tributary of the Motlhabe River on Tuschenkomst 135JP; and
- the Wilgespruit River and some of its tributaries in the south-east of the project site.

It is however noted that there are soils with wetland capability as described in section 2.6.4.

#### **2.6.8 GROUNDWATER**

The information in this section was sourced from the AGES groundwater study compiled in 2006 as well as the groundwater studies carried out by AGES in 2011.

##### **2.6.8.1 Presence of groundwater**

With reference to the approved EIA and EMP (Metago, 2007) groundwater in the project site is on average 22.5m below ground level (mbgl). The 2007 hydro-census confirmed ground water levels of between 10.73-38.33 mbgl and there is a good correlation between the ground water levels and the contours of the land.

The local groundwater flow is influenced by the presence of non-perennial drainage streams, high ground located to the east and south east of the study area in the form of the Pilanesberg and local instances of abstraction from boreholes. Overall, the groundwater flow in the study area is from the south to the north. Current abstraction practices do not appear to have a significant impact on the natural ground water gradients (AGES, 2011).

Based on the specialist findings, the review of groundwater data shows that, based on reports reviewed, there does not appear to have been a serious decline in either water quality or water levels in the area of the mine following the start of mining operations. According to AGES (2011a) borehole water levels showed an average 0.96 m decline in water levels over the 2010 calendar year, but an overall increase compared with the previous calendar year.

A visit to the mine in June 2011 confirmed that no groundwater inflows have yet been recorded in the pit (personal communication with the Mine Environmental Manager and Mine Pit Operations Manager). The

pit is currently (June 2011) 50 m deep at its deepest point of development, whilst the planned maximum pit depth is 180 – 210 m. No dewatering is currently taking place from boreholes surrounding the pit.

### **2.6.8.2 Groundwater quality**

The historic AGES data, for a wider study area, indicated that the general water quality around the project site varied between good (Class I) (acceptable) and poor (Class III) (poor) when compared to drinking water standards (South African National Standard (SANS 241:2006)).

The current groundwater samples are taken on a monthly basis as part of an on-going ground water monitoring programme that is carried out by AGES. The results indicate that the groundwater quality is generally close to or slightly above domestic use quality (DWA Water Quality Guidelines, 1996) and is dominated by bicarbonate ions. Indications are that magnesium and fluoride concentrations are elevated above the domestic use guidelines and that the water has an overall carbonate-magnesium character. The groundwater water type of the area with its distinctive calcium/magnesium and carbonate/bicarbonate character that is characteristic of recently recharged water.

Groundwater quality surrounding the proposed project site is expected to follow a similar trend however; boreholes could potentially be influenced by naturally occurring fluorides.

More specifically, the current general water quality results around the existing Tuschenkomst open pit can be summarised as follows:

- The groundwater is slightly alkaline with an average pH value of 8.
- All the recent AGES samples have an electrical conductivity (EC) value of class 1 (recommended operational limit according to SANS, 2006). The average EC of groundwater samples was 88 mS/m with a maximum of 184 mS/m.
- Most of the groundwater samples have a distinct sulphate and chloride character and this is accompanied by magnesium.
- The water quality in the monitoring boreholes at the PPM mine generally comply with a class 1 water quality (recommended operational limit) according to the SANS (2006) guideline.
- The two nitrate concentrations of groundwater samples that exceed the Class II limit (SANS, 2006). were present in groundwater samples from the mine and upstream of the pit.

### **2.6.8.3 Groundwater use**

The existing boreholes are distributed along the perennial and non-perennial streams, local dykes and local faults. Of the historic boreholes identified in the area 25% are used for domestic purposes, 5% for industrial uses and 15% for livestock watering. Majority of the communities in the area rely on ground water for domestic use purposes.

### 2.6.9 AIR QUALITY

Information in this section was sourced from the air specialist study included in the original EMP (Airshed 2007, cited in Metago, 2007).

As a result of the extension of the open pit mining, the waste and soil dumps, vehicle entrainment of dust on unpaved roads; materials handling through bulldozing, scraping, tipping, drilling and blasting; there is a contribution by the current operation to the elevated PM10 concentration in the atmosphere.

This dust is likely to have an additive effect to the current air pollution within the region including:

- industrial operations such as platinum and chrome smelter operations;
- quarrying and mining operations;
- tailings dams;
- vehicle tailpipe emissions;
- household fuel combustion;
- biomass burning; and
- various miscellaneous dust sources including agricultural activities, wind erosion of open areas, vehicle entrainment of dust along unsurfaced roads.

### 2.6.10 NOISE

Information in this section was sourced from the noise specialist study (Francois Malherbe [FMAC] 2007 cited in Metago, 2007).

The noise sensitive receptors around the PPM operations are the communities within approximately a 2km radius of the mine (Motlhabe, Ntswana-le-Metsing, Ngweding, Legkraal/Bofule, Rustenburg Minerals village, Tlhathaganyane, Mabeleleng (Malawi), and Tlhorosane), Lesetlheng and the Wilgespruit farmers and farm workers. In addition, the existing and proposed (i.e. hotel) hospitality activities on the farm Zandspruit and in the northern wilderness trail areas of the Pilanesberg National Park are considered as noise sensitive receptors.

#### Pre-mining

The noise measurements were taken at three sampling points in the project site, namely at the Black Rhino Reserve (i.e. Zandspruit Development) and at the southern boundary of Motlhabe. Based on measured results, the ambient noise levels varied from 45dBA during the day to 35 dBA during the night. The assessment of the operations determined that a village such as Ngweding would experience noise increase of up to 5dBA and the northern section of the Black Rhino Reserve would experience an increase of up to 3dBA in noise.

The ambient noise levels adopted for this project, based on the specialist assessment, are summarised in Table 7 below:

**TABLE 7: EXPECTED AMBIENT NOISE LEVELS**

Area	Ambient noise (Average level dBA)	
	Day level (Ld)	Night level (Ln)
Ngweding	50	40
Northern portion of the Black Rhino reserve (i.e. Zandspruit development) and Mabeleleng	48	38

### 2.6.11 VISUAL ASPECTS

Information was sourced from the visual specialist study (NLA 2011).

The area can be described as bushveld plains interrupted by the Pilanesberg, hills to the north and the south as well as mines and infrastructure that form part of the man-made features.

Project-related activities have the potential to further alter the landscape character of the site and surrounding area through the continued establishment of permanent infrastructure (such as the deepening of the open pit, and shaping the waste rock dump). This section provides an understanding of the visual aspects (such as aesthetic value, landscape character, sense of place, scenic quality, and sensitive views) of the project site against which to measure potential change as a result of project infrastructure and activities.

## 2.7 RELEVANT ADDITIONAL INFORMATION

None.

### 3 IDENTIFICATION OF THE ANTICIPATED IMPACTS

The chapter has been structured as follows:

- Sections 3.1 - 3.5 provide the reader with a description of the proposed project; as it is the activities that stem from these phases that will potentially impact the environment.
- Section 3.7 links the project activities to the activities that are regulated under the National Environmental Management Act, 107 of 1998.
- Finally, sections 3.9-3.14 conceptually identify and describe the potential impacts caused by the mining activities.

The project description provides an outline of the anticipated activities that could occur on the site as a result of the PPM Tuschenkomst pit extension project. This is done for each phase of the project from construction through operation to decommissioning and closure.

Potential environmental, social or cultural impacts, including the cumulative impacts, where applicable, that were identified during the scoping process are discussed under environmental component headings in this section. These discussions should be read with the corresponding descriptions of the baseline environment in Section 2 of the scoping report.

The potential impacts associated with all the project phases (construction, operations, decommissioning and closure) have been conceptually identified and described (see sections 3.9-3.14) and reference has been made to the studies/investigations (see section 6) that are required to provide the necessary additional information.

#### 3.1 PROJECT DESCRIPTION

A description of the proposed project follows in the sections below. These sections should be read together with Figure 3 (a map illustrating the extent of the Sedibelo West Project area, the spatial locality of the existing and proposed infrastructure, the mining area extension and associated activities).

PPM is currently open pit mining on the farm Tuschenkomst 135JP. Ore from the open pit operations is transported to the concentrator plant for processing, waste rock is stockpiled on existing approved waste rock dumps. For the proposed pit extension project, PPM is planning to:

- Extend the existing Tuschenkomst open pit onto the farms Wilgespruit 2JQ (to the east) and Portion 1 of Rooderand 46JQ (to the south); including topsoil and overburden stockpiles.
- Extend 30m wide, gravel haul roads from the farm Tuschenkomst 135JP onto the other farms within the project area.
- Establish storm water management facilities (i.e. berms, channels and dams).

- Establish bridge/s over the Wilgespruit River and its tributaries to access operations.
- Establish new telecommunications tower/s.
- Close a section of the provincial P50-1 (east / west alignment and connects the R510 to the P54-1) and the opening of one of three road diversion alternatives.
- Extension of the existing waste rock dumps on the Tuschenkomst farm.
- Establishing waste rock dumps on the Wilgespruit farm.

Certain components of the approved infrastructure at the Sedibelo Mine will be located within the Sedibelo West Project area as a result of the Mining Right Abandonment Agreement signed between PPM and the IBMR (see the introduction of this report ). These structures will be the western portion of the tailings storage facility (TSF) and the western portion of the waste rock dump (WRD). PPM may supply the waste rock to be used to construct the walls of these facilities that will be assessed in the Sedibelo EIA and EMP amendment. With regards the financial provision (see section 6.4) PPM will finance the liability of all the structures except those structures that form part of the IBMR mining right area.

## **3.2 CONSTRUCTION PHASE**

Given that the project mainly concerns the extension of the Tuschenkomst open pit, limited construction will take place for the project. Further detail is provided below.

### **3.2.1 FACILITIES**

Where possible existing, infrastructure already available at the current PPM operation will be used for the project.

Some construction facilities will however be required closer to the project sites. The following new facilities maybe required:

- mobile site offices;
- portable ablution facilities;
- clean water tank;
- temporary power generating infrastructure (i.e. generator); and
- security and access control.

These facilities could potentially be removed at the end of the construction phase or incorporated into the PPM operational mine layout.

### 3.2.2 ACTIVITIES AND SUPPORT SERVICES

The following general construction activities are expected to take place in establishing this project:

- selective clearing of vegetation in areas designated for surface infrastructure in line with the biodiversity and soil management plans that are being implemented;
- stripping and stockpiling topsoil and sub-soil (see Figure 3);
- limited digging of foundations and trenches;
- delivery of materials; and
- general building activities.

Although the following information is not specifically requested in the DMR guideline, it has been provided to provide project context.

#### 3.2.2.1 Construction phase water supply

Water for construction purposes will be brought in by tankers. Approximately 300 m<sup>3</sup> will be required per day during the construction phase. This water will be used for drinking and construction purposes.

#### 3.2.2.2 Construction phase power supply

Electricity for construction purposes will be provided by portable generators.

#### 3.2.2.3 Construction phase transport systems

##### Deliveries

Materials required for the construction phase will be brought to site via the existing road network that surrounds the proposed project (refer to Section 2.5.5 for details).

The deliveries to this project site will take place along the existing provincial P50-1 (east / west alignment and connects the R510 to the P54-1). Deliveries will be made to the mine and contractor sites before being delivered to the project site via internal roads. The traffic associated with these deliveries will be assessed in the EIA and EMP as described in section 6.1.14

##### Construction workforce

No additional jobs are predicted during the proposed project and as a result the existing workforce will be utilised for the construction work at the project site. No additional traffic is associated with the construction workforce.

##### Existing roads

As part of the construction phase of the project PPM propose to prepare one of three road diversions as an alternative to the proposed closure of a section of the provincial P50-1 (east / west alignment and connects the R510 to the P54-1) (See Figure 3). The traffic impacts associated with these diversion alternatives will be assessed in the EIA and EMP report as described in section 6.1.14

### **3.2.2.4 Construction phase waste management**

#### Sewage

The construction workforce will be provided with the applicable number of fully serviced chemical toilets for the duration of the construction phase of the project.

The sewage generated at these toilets will be collected by a honey sucker truck and transported to the existing PPM sewage plant (see Figure 3). Here the sewage will be processed, treated and the solids separated to the adjacent drying beds.

PPM propose that in future the dried material from the drying beds is removed from the site and transported by truck along the existing internal roads to the side walls of the TSF. Here PPM will use this material as a fertiliser material for vegetation to create the 'rising green wall' effect. An application in terms of the National Environmental Management Waste Act, 59 of 2008 (NEMWA) has been submitted to DWEA.

#### Non-mineralised waste

The types of waste that could be generated during construction include: limited hazardous industrial waste (such as packaging for hazardous materials, used oil, lubricants), small quantities of general industrial waste (such as scrap metal and building rubble), and limited domestic waste (such as packaging, canteen waste and office waste). These wastes will be temporarily handled and stored at the existing, operational PPM site before being removed for recycling by suppliers, reuse by scrap dealers or final disposal at permitted waste disposal facilities.

### **3.2.2.5 Construction workforce and housing**

The construction workforce will comprise the current MCC contractor work force. As a result there will be no additional work opportunities generated by this project; the current contracts will be extended by a further eight years in line with the extended life of mine. No workers are currently housed on the mine and no workers will be housed on site during the proposed project according to the existing PPM Housing policy.

### **3.2.3 CONSTRUCTION PHASE TIMING**

This phase is scheduled to last approximately two years if this project is authorised by the relevant departments



### 3.3 OPERATIONAL PHASE

#### 3.3.1 SURFACE INFRASTRUCTURE

The following existing PPM facilities will be used for the operational phase of the project:

- contractor's camp;
- workshop/maintenance area for servicing and maintaining equipment and vehicles;
- lay-down area;
- temporary waste collection and storage area;
- wash bay for washing equipment and vehicles;
- store for storing and handling fuel, lubricants, solvents, paints and construction substances;
- parking area for cars and equipment;
- canteen;
- portable ablution facilities;
- change houses;
- temporary power generating infrastructure;
- explosive magazines;
- security and access control;
- haul roads;
- access roads; and
- first aid clinic.

**FIGURE 3: EXISTING INFRASTRUCTURE LAYOUT AT PILANESBERG PLATINUM MINES**

**FIGURE 4: LOCAL SETTING WITH PROPOSED INFRASTRUCTURE LAYOUT**

### 3.3.2 MINING METHOD

PPM will mine the minerals using the conventional open pit mining method by extending sections of the current high wall of the current Tuschenkomst open pit into the farms Wilgespruit 2JQ (to the east of the pit) and portion 2 of Rooderand 46JQ (to the south).

The extended pit will be mined over a strike length of 3.72km down to a maximum depth of 210m at an average waste to ore strip ratio of 8.97:1 (Cube Consulting, 2009). The Merensky and associated silicate reefs will be bulk mined at a rate of 315 000 tonnes per month inclusive of UG2 selectively mined at a rate of 65 000tpm according to the current mine works programme (MWP, July 2010). This will be revised and optimised continuously.

The final pit wall slopes will be mined at a high wall angle as determined in the Mining Code of Practice (a mandatory code of practice to combat rock falls and slope instability relating to accidents in surface mines).

The operational bench height may vary between 5m and 15m for drilling and blasting, however, the mining benches may vary from 2.5m -5m for the loading of ore and waste. PPM has begun concurrent backfilling of material that is mined from the eastern side of the open pit and deposited on the western side of the open pit using the existing exit ramps and by end tipping material along the western pit slope.

The waste rock removed from the open pit during the operational phase will be used to partially backfill the pit until it has an estimated void 50-60 million cubic metres. During concurrent rehabilitation the waste rock will be used to contour the western edge of the extension pit and slope this towards the deeper eastern section. During the concurrent rehabilitation the side slopes will be contoured to allow the final remaining void to be used as a water storage facility.

The construction of the Tuschenkomst pit started in 2008 when the original box cut was excavated on the farm Tuschenkomst 135JP. The authorised dimensions of the Tuschenkomst open pit are provided in Table 8 below together with the proposed expansion dimensions.

**TABLE 8: COMPARISON OF THE PROPOSED DIMENSIONS OF THE EXTENDED TUSCHENKOMST OPEN PIT WITH THOSE PROVIDED IN THE ORIGINAL EMP 2007**

<b>Dimensions</b>	<b>Pit extension (current amendment)</b>	<b>Original pit (EIA/EMP, Metago 2007)</b>
Length	~3720m (total length)	3500m
Width	~1560m (total width)	1500m
Depth	~210m (average depth)	150m
Volume	324Mm <sup>3</sup> (total volume)	112.5Mm <sup>3</sup>

<b>Dimensions</b>	<b>Pit extension (current amendment)</b>	<b>Original pit (EIA/EMP, Metago 2007)</b>
Partial backfill volume	211Mm <sup>3</sup> starting in 2014	No partial backfill, complete backfill
Ore production rate	315 000 tonnes per month	315 000 tonnes per month
Waste rock production rate	Up to 1.5 million m <sup>3</sup> per month (revised rate) (approx. 4.4 million tonnes per month)	2.4 million tonnes per month
Mining start date	2 <sup>nd</sup> quarter 2012	2008
Life of the pit	An additional 6 years from start of extension	12-13 years
Soil removal rate	240 000 tonnes per month or as required	240 000 tonnes per month
Soil volume	1.3Mm <sup>3</sup> (In addition to the volume quoted in the original EMP)	2.55Mm <sup>3</sup>

The following activities below will take place on site in support of the proposed mining operation:

### **3.3.2.1 Drilling and blasting**

Once the topsoil has been removed, the area will be drilled as per a predetermined design (Metago EIA and EMP, 2007). Charges will be designed to prevent excessive ground vibration and fly rock. The overburden and the ore will be drilled and blasted separately. The blast design may be modified from time to time in order to optimise grade and minimise dilution.

### **3.3.2.2 Removal of overburden from the pit void**

The removal of overburden above the ore body will be carried out as a bulk mining operation by load and haul with large equipment. Some of the waste rock material will be disposed of at the Sedibelo waste Rock dump facility (WRD), a portion at the Sedibelo tailings storage facility (TSF), the proposed DMS disposal site and the remaining waste rock will be deposited on the existing Tuschenkomst WRD. As a result the footprint of the Tuschenkomst WRD will expand in all directions.

### **3.3.2.3 Removal of ore**

Prior to the ore removal, the top of the reef horizon will be cleaned. The area will then be inspected and approved by the responsible Mine Geologist prior to mining. The reef packages will be removed down to the footwall contact. The final footwall will then be swept to ensure that all the fines are recovered. The ore will continue to be hauled to the plant for crushing and processing.

### 3.3.2.4 Waste rock dumps

PPM has an approved WRD on the Tuschenkomst farm with a planned 115ha footprint to accommodate the 30% bulking of the 80million m<sup>3</sup> of waste rock material that has been removed from the current Tuschenkomst pit. As indicated in section 3.3.2.2, this additional waste rock will be deposited on a number of proposed sites as well as on the approved Tuschenkomst WRD (i.e. will need to be expanded to accommodate the additional waste rock from the extended pit).

During the operations, waste rock will in addition be deposited on sites on Wilgespruit 2JQ and this will be assessed by the Sedibelo EIA and EMP amendment.

The historical and proposed operational expansion dimensions of the Tuschenkomst WRD are provided in Table 9 below.

**TABLE 9: COMPARISON OF THE PROPOSED DIMENSIONS OF THE TUSCHENKOMST WRD WITH THOSE PROVIDED IN THE ORIGINAL EMP 2007 AND 2009 AMENDMENT**

	WRD dimension after expansion (current amendment)	WRD dimension	
		EIA and EMP, Metago 2009	EIA and EMP, Metago 2007
<b>Height</b>	75m (final height)	60m (final height)	60m
<b>Area</b>	226ha (final area)	213ha (final area)	138ha
<b>Volume</b>	76.965Mm <sup>3</sup> (final volume)	75Mm <sup>3</sup> (final volume)	75Mm <sup>3</sup>
<b>Bench height/ slope/ overall slope</b>	15m/ 1V:3H/ 1V:4H	15m/ 1V:3H	15m/ Angle of repose
<b>Life of the waste rock dump</b>	An additional 6 years	10-11 years from the approval date	12-13 years from the approval date
<b>Topsoil volume</b>	~0.628M m <sup>3</sup> final volume)	~0.375Mm <sup>3</sup> final volume)	~0.580Mm <sup>3</sup>
<b>Rehabilitation method</b>	Concurrent shaping and sloping of side slopes. Landscape to blend in with surrounding hills.	70% of material backfilled into the pit void and remaining 30% to be topsoiled and re-vegetated back to wilderness and grazing capabilities	70% of material backfilled into the pit void and remaining 30% to be topsoiled and re-vegetated back to wilderness and grazing capabilities

In terms of the proposed amendments to the closure objectives (SLR, 2011) approximately 65% of the waste rock material will be used to concurrently rehabilitate and partially backfill the pit as per the mining and backfill schedule (MWP, July 2010) while the remainder will remain on surface in the form of contoured waste rock dumps. The waste rock dumps in question for this study are the Tuschenkomst WRD, a portion of the Sedibelo WRD, the DMS area WRD. It is likely that the final footprint of the contoured Tuschenkomst waste rock dump will extend beyond the current planned footprint because of requirements to flatten the side slopes to a gradient in the range of 1V:4H (overall gradient). This will be quantified and assessed as part of detailed mine closure planning. In addition the technical team will investigate a means to create berms on each lift that does not hinder the future passage of animals within the dangerous game corridor of the proposed heritage park. The revised footprint at the western toe of the WRD will extend into the 100m buffer of the tributary of the Motlhabe River. The WRD extension will not cross the watercourse and all waste rock related infrastructure will be re-enforced to prevent erosion and prevent the potential contamination of clean water.

### **3.3.1 OTHER SUPPORT SERVICES**

Although the following information is not specifically requested in the DMR guideline, it has been provided to provide project context.

Because this is an expansion project use will be made of existing infrastructure and facilities at PPM where possible. The description below relates only to the new infrastructure and technical detail that is required for this expansion project.

#### **3.3.1.1 Operational phase workforce and housing**

The operational workforce will comprise the current MCC contractor work force. As a result there will be no additional work opportunities generated by this project, the current contracts will be extended by a further eight years in line with the extended life of mine. No workers are currently housed on the mine and no workers will be housed on site during the proposed project according to the existing PPM Housing policy.

#### **3.3.1.2 Operational phase water supply**

The mine will continue to use potable water sourced from Magalies Water (MW). This water will be transported to the project area in an underground UPVC pipeline of diameter <500mm. Approximately 9Mm<sup>3</sup> will be required per day during the operational phase.

#### **3.3.1.3 Operational phase power supply**

The telecommunications tower/s will require electrical power for operations. The power supply will be supplied from the mines existing power supply. The emergency supply for the telecommunications tower will continue to be the solar panel and limited battery backup supply.

#### **3.3.1.4 Operational phase transport systems**

There will be no additional employment nor will production at the mine increase as a result of this project, therefore no increase in traffic volumes are expected (i.e. work force or deliveries). All traffic relating to the project site will use the internal road and haul road system

##### Internal haul road network

The proposed haul roads will be operated on the farms Wilgespruit 2JQ and portion 2 of Rooderand 46JQ as an internal road system that does not link with the external provincial roads.

The haul roads will be extended as the pit advances and the road will be constructed outside the expansion limits of the extended Tuschenkomst pit, albeit that the roads will fall within the 500m blast radius of the pit extension. The proposed network of haul roads will be approximately 5-10km long and 30m wide on average to accommodate mine vehicles. These haul road servitudes will also serve as servitudes for power and water supply lines to the project site as required.

##### Proposed road diversions

See section 4.2.1.

##### Wilgespruit River crossings

There are two crossings required. One crossing will be required to allow access over a seasonal drainage line where a low drift-like structure will need to be constructed to allow tipper trucks and vehicles to cross during the wet season.

The second crossing is further south within the project site and will need to be constructed over the main Wilgespruit channel/s.

#### **3.3.1.5 Operational phase communications network**

One or a number of 30m tall very high frequency (VHF) radio masts will be operated on this project site for radio-communication into the mining pit for safe operation and management of the open pit and haul roads. One of the technical requirements of the tower/s is that they should be placed in line of sight of the extended Tuschenkomst open pit, so as to avoid any signal 'dead-spots'.

#### **3.3.1.6 Operational water management**

##### Storm water

In accordance with Regulation 704, a storm water management system will be established to separate the clean and dirty storm water that occurs on this project site. The clean water diversion berms will divert clean water back into the Wilgespruit channel in a controlled manner. A series of smaller dams will be built (approximately 2 500-5 000 m<sup>3</sup>) to capture dirty water run-off from the topsoil stockpiles. The dams



will be designed, and operated so as not to spill more than once in 50 years. The run-off from the Sedibelo WRD, while the storm water from the extended Tuschenkomst WRD will be managed by toe paddocks on the western side and an existing storm water toe paddock and dam system on the eastern side of the WRD. This dirty water from the dams will be collected and either used as process water at the plant or for dust suppression purposes.

#### Water balance

A conceptual average monthly water balance currently exists for the PPM operation as per the approved EIA and EMP. This has been updated and submitted along with the mine's water use licence application. As the proposed project will not significantly change the mine's use of water apart from the addition of the storm water facilities, no significant changes to the mine's water balance are expected. An updated water balance will be provided in the EIA and EMP report.

#### De-watering

In order for mining to occur in the open pit there will be the need for de-watering to occur. This water will be pumped to existing settling dams and used in the plant as makeup water. This will be assessed in the EIA and EMP report.

### **3.3.1.7 Operational waste management**

#### Sewage

During operations existing sewerage infrastructure will be used. The sewage will be treated at the existing sewage treatment works where liquids and solids will be separated. The dried sewage sludge, from the existing drying beds, will be transported from the drying beds by road and deposited on the side walls of the existing TSF. These solids will make up the fertilising medium for re-vegetation of the side walls of the tailings dam.

#### Non-mineralised wastes

All non-mineralised wastes (domestic, building rubble and scrap) generated by these operations will be collected and managed within the current waste management system at the PPM operations.

#### Mineralised waste disposal – tailings disposal

Not applicable for this project.

#### Mineralised waste disposal – Waste rock disposal

These facilities will be operated as per Section 3.2.3 and Table 9.

### **3.3.2 LIFE OF MINE**

This phase is scheduled to extend the LoM of the pit by six to seven years if this project is authorised by the relevant departments.

### 3.4 DECOMMISSIONING

As part of the decommissioning stage of this project, the weathered material on the high wall side of the pit extension will be cut back to an angle as determined by the Mandatory Code of Practice to combat rock falls and slope instability related accidents in surface mines. Accordingly PPM has allowed for between 300-600m safety zone (depending on the requirements of the Mining Code of Practice at the time) between the edge of the pit and the storm water / safety berm.

Consolidation of overburden used as partial backfill in the open pit could result in surface subsidence and erosion. Any subsidence will be corrected by placement of more overburden in the partially backfilled areas of the pit. If required, the correction will be implemented in the safety zone and partially backfilled areas during the life of mine. The pit will also be prepared for flooding.

At the same time the infrastructure located on the project site, not required by PPM, will be decommissioned. A decision on what will remain and what will be decommissioned will be discussed with the BBKTA and surrounding communities during closure planning.

Additional open pit preparations will include:

- profiling and shaping of the high wall once all men and machinery vacate the bottom of the pit;
- continue to establish the benches in the high wall at 15m in height and the eventual angle of the profiled high wall will be defined by the Mandatory Code of Practice;
- on the final bench at the top of the high wall (i.e. where the first layer of softs is encountered the soft material will be cut back to a 1:3 slope or as determined in the Code of Practice and a berm will be constructed at the extremity of the safety zone and at the top of this slope.
- the earth berm will be re-vegetated and a fence erected to prevent egress and access to the high wall area.

After the Tuschenkomst pit has reached its full extension and the PGM ore body has been mined out, the Wilgespruit will be redirected back to its normal flow path, into the pit. The extended pit will be allowed to fill from the combination of groundwater recharge and surface water from the catchment. AGES conducted surface and groundwater studies; these and the modelling showed that there is sufficient water and that the pit will fill gradually over time and the water level will stabilise at approximately 1 010 mamsl after approximately 10 years with concurrent abstraction of 1.7MI/day to the community (i.e. 100m below the high wall and cover approximately 61.82ha) and have a storage capacity of 50-60Mm<sup>3</sup> (AGES, 2011). The water can be sustainably abstracted from the time that the extended pit is no longer being mined and the pit is allowed to flood (i.e. a sustainable yield of between 1.7MI/ day, could potentially be used to supply communities with water).

### 3.5 REHABILITATION

Rehabilitation will be concurrent with the mining operation from 2014. Waste rock will be used as partial backfill material for the open pit and concurrent rehabilitation will begin on the lower benches of the Tuschenkomst WRD, where topsoil will be placed over the waste rock and vegetation will be re-established.

### 3.6 CLOSURE

The side walls of the open pit and the slopes of the waste rock dumps would have been contoured, landscaped and vegetated during the operational phase of the mine to allow any problematic areas to be rectified during the life of the mine. This element of the closure and rehabilitation of the mine would be done in consultation with key stakeholders (i.e. BBKTA, NWPTB, Black Rhino and the communities) thereby ensuring that the rehabilitated areas are fit for communal grazing or wilderness use (i.e. incorporated into the heritage park corridor). The final rehabilitated pit void will be flooded and used as a water storage facility.

### 3.7 RELEVANT NEMA LISTED ACTIVITIES

The potential listed activities were discussed with the Department of Economic Development, Environment, Conservation and Tourism (DEDECT) in terms of the National Environmental Management Act, 107 of 1998 (NEMA) in February 2011.

As part of the planning process and as the NEMA activities have been triggered, the necessary applications have been made to DEDECT for the listed activities in terms of Regulations 544, 545 and 546 in Table 10 below. For the NEMWA listed activities see Table 11 below.

**TABLE 10: LISTED ACTIVITIES RELEVANT TO THIS PROPOSED AMENDMENT**

<b>Number and date of the relevant notice</b>	<b>Activity No (s) (in terms of the relevant notice) :</b>	<b>Description of each listed activity as per project description</b>
544, 02 August 2010	11	<i>PPM will construct relevant infrastructure within 32m of the Wilgespruit River.</i>
	12	<i>PPM proposes to construct an off-stream storm water control dam with the capacity to hold more than 50 000 cubic metres of storm water at any one time.</i>
	18	<i>PPM proposes to construct a bridge to cross the Wilgespruit River and the footing of this bridge will require that at least 5 cubic metres of soils/ pebbles/ rocks are moved/ removed.</i>
	22	<i>PPM has proposed three possible alternatives to divert the P50-</i>

		<i>1 Provincial Road. The proposed diversion will have a width in excess of 9m. Furthermore, PPM will extend the haul road either side of the proposed bridge over the Wilgespruit River.</i>
	28	<i>The changes to the waste rock dump, the open pit and the storm water management system at the existing mine will require an amendment to the current water use license application for the control of pollution.</i>
	47	<i>In some instances PPM may widen existing 8m wide roads that have no road reserve by 6m or more and may in instances extend these roads by more than 1km.</i>
545, 02 August 2011	15	<i>Some of the infrastructure developments that PPM is proposing will physically alter more than 20ha of previously undeveloped land.</i>
	5	<i>The changes to the waste rock dump, the open pit and the storm water management system at the existing mine will require an amendment to the current water use license application for the control of pollution.</i>
	19	<i>PPM proposes to construct a storm water dam on the site. The highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, will be greater than 5 metres and the high-water mark of the dam will cover an area of approximately 10 hectares.</i>
546, 02 August 2011	3	<i>PPM proposes to construct a 30m high communications mast within the North West Province. This communications tower will be located outside any urban areas and this mast will be within a distance of 5km from the Pilanesberg National Park.</i>
	4	<i>PPM proposes to construct roads that will be wider than 4m and have a road reserve less than 13.5 metres. These roads will be located within a distance of 5km from the Pilanesberg National Park.</i>
	14	<i>PPM proposes to clear more than 5ha of indigenous vegetation (i.e. 75% and more of this vegetation cover constitutes indigenous vegetation) within the North West Province outside of an urban area.</i>
	19	<i>PPM proposes to widen roads by more than 4m or extend them by more than 1 kilometre. These roads will be located within a distance of 5km from the Pilanesberg National Park.</i>

**TABLE 11: RELEVANT NEMWA LISTED ACTIVITIES**

<b>DATE OF THE RELEVANT NOTICE:</b>	<b>ACTIVITY NUMBERS</b>	<b>LISTED ACTIVITY DESCRIPTION</b>
GN32368, July 2009	Category B4 (9)	<i>PPM Proposes to dispose of its treated sewage sludge on the walls of the tailings storage facility as part of the re-vegetation and concurrent rehabilitation of the tailings storage facility (i.e. this is regarded as the disposal of any quantity of hazardous waste to land -treated sewage sludge)</i>
GN32368, 3 July 2009	Category A3 (2)	<i>The storage including temporary storage of hazardous waste at a facility that has the capacity to store in excess of 35m<sup>3</sup> of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons.</i>

### 3.8 CONFIRMATION OF IAP CONSULTATION AND AGREEMENT ON POTENTIAL IMPACTS

IAPs were provided information on the potential impacts during the public scoping meeting. All of the IAP issues, concerns and objections raised during the scoping meetings have been provided in Appendix D. IAPs will also have the opportunity to review this scoping report.

### 3.9 POTENTIAL CULTURAL ENVIRONMENT IMPACTS

A list and description of potential impacts identified with the cultural environment is provided below as part of archaeological and heritage impacts.

### 3.10 POTENTIAL HERITAGE ENVIRONMENT IMPACTS

A list and description of potential impacts identified on the archaeological, heritage and cultural environment is provided below.

#### 3.10.1 ARCHAEOLOGICAL, HERITAGE, CULTURAL AND PALAEOLOGICAL RESOURCES

##### 3.10.1.1 Issue: Loss of or damage to heritage and/or paleontological resources

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The loss or damage to heritage or palaeontological resources is most likely to occur where the disturbance of new areas with new infrastructure occurs. There are a number of activities/infrastructure in all phases of the proposed project that have the potential to damage heritage resources (i.e. heritage landscape and individual heritage resources) and result in the significant loss of the heritage for future generations particularly to the east of the Tuschenkomst WRD; where known heritage resources exist. There is also the potential for chance finds as excavations occur on the project site and this will be assessed in the EIA and EMP report. The additional specialist work required to investigate and assess this issue is discussed in section 6.1.12 of this report.

### 3.10.2 PALAEOLOGICAL RESOURCES

#### 3.10.2.1 Issue: Loss of or damage to palaeontological resources

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

#### Discussion

The project area is underlain by igneous rocks of the Rustenburg Layered Suite of the Bushveld Complex. This Complex is an intrusive igneous body and the geology is of a Precambrian age and as a result it is unlikely that fossils will be affected by the proposed open pit mining development. The additional specialist work required in assessing this issue is described in Section 6.1.13 of this scoping report.

### 3.11 POTENTIAL SOCIO-ECONOMIC ENVIRONMENT IMPACTS

A list and description of potential impacts identified on the socio-economic conditions of any person on the property, and on any adjacent or non-adjacent property that may be affected by the proposed mining operation, is provided below.

#### 3.11.1 LAND USE

##### 3.11.1.1 Issue: impact on existing surrounding agricultural, tourism and residential uses

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

#### Discussion

The project site is located in a region that is impacted by mining, ecotourism, communal grazing and human habitations. The area in question is currently occupied by an open pit mine adjacent to mining related infrastructure.

The proposed end land uses will be significantly impacted by the project in that future communal grazing land will potentially be lost and a permanent water resource and a number of landforms left in its place.

The potential communal grazing land in the area is currently being reduced by the development of mines in the area and will be further impacted by the development and fencing in of the proposed heritage park corridor. This corridor could exclude livestock from significant areas with grazing potential.

Discussions were held between PPM and BBKTA on 1 August 2011 to discuss the alternative areas that could potentially be utilised for communal grazing. According to the BBKTA there is alternative grazing on Wachteenbeetjeslaagte (i.e. under the auspices of DRDLR). The extent of this alternative and the acceptability thereof to the farmers in question has not been independently verified.

In the case of the heritage park corridor the collective mine developments and the proposed flooded pit project should not act as an obstacle within the proposed corridor. In this regard, the NWPTB has evaluated a number of alternative corridors between the Pilanesberg National Park and the Madikwe Game Reserves.

In the case of the heritage park land use PPM has committed to working with NWPTB to ensure that this corridor is maintained at its maximum width while passing through PPM and BBKTA land. The additional specialist work required in assessing this issue is described in Section 6.1.4.1 of this scoping report.

### 3.11.2 TRANSPORT SYSTEMS

#### 3.11.2.1 Issue: Disturbance of roads by project-related traffic and infrastructure

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

#### Discussion

The proposed project is not expected to increase the number of work opportunities at the mine, there may potentially be an increase in deliveries during the construction phase and this will need to be investigated in the EIA and EMP report. It will instead increase the LoM by a further six years and therefore there will be little potential impact on mine related traffic. In comparison the extension of the pit onto the farms Wilgespruit 2JQ and Rooderand 46JQ Portion 1 will necessitate the re-alignment of the P50-1 as well as the road to the east of the current pit that connects the P50-1 to the community of Ngweding. The proposed diversions illustrated in Figure 3 will impact on the current routes used by public and private transport (see alternatives discussion in section 4.2.1) The additional specialist work required in assessing this issue is described in Section 6.1.14 of this scoping report.

### 3.12 POTENTIAL IMPACTS ON EMPLOYMENT OPPORTUNITIES, COMMUNITY HEALTH, COMMUNITY PROXIMITY AND LINKS TO THE SOCIAL AND LABOUR PLAN

A list of potential impacts (positive and negative) on: employment opportunities, community health, community proximity and links to the Social and Labour Plan, is provided below.

#### 3.12.1 POSITIVE AND NEGATIVE SOCIO-ECONOMIC IMPACTS

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

#### Discussion

In the broadest sense, activities associated with the project will have social and economic impacts in all project phases. Some of these are considered to be positive impacts and others are considered to be negative impacts. The separate social and economic impacts are discussed below.

In the case of the extension of the open pit the WRD and the construction and operation of infrastructure on the project site, no new jobs will be created. The life of mine will be extended by a further six years and as a result the current jobs will continue for that period of time. Additional social benefits could include positive impacts of increased local spending in the area, generation of tax revenue, the provision of a safe potable water resource and the secondary impacts associated with this.

The development of the project site on the Wilgespruit 2JQ and portion 1 of Rooderand 46JQ, if approved by DEDECT, could result in the displacement of an unknown number of communal cattle farmers who employ resident herders with associated housing and kraal structures. At this point it is unknown how many people (i.e. cattle and arable farmers) will be affected and displaced and if BBKTA has a contingency plan of where to relocate these people to. PPM has already started consulting with the BBKTA with regards to the compensation and potential relocation of resident farmers and this process will be driven by PPM to ensure that all affected parties are compensated fairly. The additional specialist work required in assessing this issue is described in Section 6.1.15 of this scoping report.

### 3.13 POTENTIAL BIOPHYSICAL ENVIRONMENT IMPACTS

A list and description of potential impacts identified with the biophysical environment including but not limited to impacts on: flora, fauna, water resources, air and noise etc; is provided below.

#### 3.13.1 GEOLOGY

##### 3.13.1.1 Issue: Loss and sterilisation of mineral resources

Project phase/s in which impact could occur



Construction	Operational	Decommissioning	Closure

### Discussion

It is important that no potential future resources be sterilised by the project as it may become feasible to mine them in the future.

Significantly, there has been and will be no sterilisation of minerals by the placement of surface infrastructure (the site layout took into consideration potential future mineable reserves). Technical input will be required to assess the potential impact of the impact of rapid draw down of water in the pit on the rock mechanics and safety aspects of the pit walls. The additional specialist work required in assessing this issue is described in Section 6.1.4.2 of this scoping report.

## **3.13.2 TOPOGRAPHY**

### **3.13.2.1 Issue: hazardous excavations and infrastructure**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

### Discussion

The construction of the required storm water infrastructure, dam/s, telecommunications tower and bridge foundation and possible potable water pipeline will require the excavation of trenches and these will be shallow yet potentially hazardous structures. The construction and contouring/shaping of the waste rock dump and the edge of the pit will change the topography on the site. The existence of the expanded waste rock dump and the partially backfilled, extended and flooded pit could pose a safety risk to third parties and migrating animals.

These hazardous structures include all excavations, infrastructure or land forms into or off which third parties (non-mine personnel) and animals can fall into or off of and be harmed. The hazardous excavations and infrastructure occur in all project phases from construction through operation to decommissioning and closure phases. . The additional specialist work required in assessing this issue is described in Section 6.1.2 of this scoping report.

## **3.13.3 SOIL AND LAND CAPABILITY**

### **3.13.3.1 Issue: Loss of soil and change in land capability through sterilisation, erosion and contamination**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure



Through diverting the Wilgespruit River back into the extended pit the total loss of surface run-off to the Crocodile River catchment is approximately 0.1% (AGES, 2011) and therefore no impact on the greater catchment is anticipated. The drainage patterns of the main channel of the Motlhabe tributary are not likely to be impacted by the Tuschenkomst WRD.

The drainage patterns of the section of the Wilgespruit River, immediately downstream of the extended pit up to the confluence point with the Bofule River will be impacted once the Wilgespruit is re-diverted back into the pit. This in turn may affect the users in this downstream section (i.e. cattle herders and their livestock). The additional specialist work required in assessing this issue is described in Section 6.1.6 of this scoping report.

### 3.13.5.2 Issue: Contamination of surface water

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
///	///	///	///

#### Discussion

The original EIA and EMP (Metago, 2007) indicated that the background surface water quality was of a good quality with some samples indicating an elevated source of fluoride; most probably derived from the alkaline Pilaesberg intrusive. This background mineral concentration is not expected to cause impacts to livestock drinking water in the area (AGES, 2011).

The proposed project could contaminate the surface water through the following: hydrocarbon spills from vehicles and machinery, discharges or run-off from the WRD and overflows from the dirty water systems. The contaminated water can be harmful to people and livestock at elevated concentrations. The additional specialist work required in assessing this issue is described in Section 6.1.6 of this scoping report.

### 3.13.6 GROUNDWATER

#### 3.13.6.1 Issue: Reducing groundwater levels and availability

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
///	///	///	///

#### Discussion

AGES determined that the natural ground water depth in the area is approximately 1060mamsl in the vicinity of the pit. The pit is currently excavated deeper than 50m in places within the Tuschenkomst open pit (i.e. 1055mamsl) near to where the water table is expected. To date, some ground water has been encountered during the mine operations and as a result minimal de-watering has taken place.



With projects of this nature, the main emissions include: inhalable particulate matter less than 10 microns in size (PM10), larger total suspended particulates (TSP), and limited gas emissions. Gaseous pollutants (such as sulphur dioxide, oxides of nitrogen, carbon monoxide, etc.) will derive from vehicle exhausts but are regarded as negligible in comparison to particulate emissions. The inhalable components of particulates can cause human health impacts at high concentrations over extended periods, while the larger particulate component can cause animal and plant health impacts. In the case of animals, the soiled vegetation matter becomes unpalatable and thereby reduces the grazing areas and furthermore, grazing on soiled vegetation over extended periods reduces teeth life which can reduce animal life expectancy. In the case of plants, soiling of vegetation can reduce growth and productivity.

Sensitive receptor points include the villages to the north (i.e. Ngweding – 500m) and south (Legkraal – 1000m) that are in close proximity to the pit. The additional specialist work required in assessing this issue is described in Section 6.1.9 of this scoping report.

### 3.13.8 NOISE

#### 3.13.8.1 Issue: Increase in disturbing noise levels

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

#### Discussion

General noise disturbance can be defined as an increase in ambient noise levels. Although the legal limit for an increase in ambient noise is 7 dB (national noise regulations), this should not be construed as the upper limit of acceptability. SANS 10103 identified that an increase of 5 dB is considered a significant impact. Noise nuisance on the other hand is defined by SANS 10103 as any sound which disturbs, or impairs the convenience or peace of any person. These noises are either difficult to capture, or are noises for which the readings registered on sound level metres do not correlate satisfactorily with the annoyance it causes when assessed against standard criteria.

If one considers the current situation on site, all of the proposed noise sources already exist in similar geographical positions to what is proposed. The additional specialist work required in assessing this issue is described in Section 6.1.10 of this scoping report.

### 3.13.9 VISUAL ASPECTS

#### 3.13.9.1 Issue: Negative visual impacts

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

### Discussion

Visual impacts will be caused by activities and infrastructure in all project phases. The activities associated with the mine, the process plant, the current WRD and the Tuschenkomst open pit are visible, to varying degrees from varying distances around the project site. During construction of infrastructure within the Project site this visibility will be influenced by the increase in activities, removal of vegetation on site and the construction of the telecommunications tower. During operation/decommissioning/closure phases the visual qualities of the project site will be influenced by the presence of infrastructure and development of the Tuschenkomst waste dump and the effectiveness of rehabilitation measures. Furthermore the deeper pit will also be visible during operations. The more significant activities and structures are considered to be construction and operational aspects that include the waste rock dump, the telecommunications tower and night lighting needed for safety purposes. The additional specialist work required in assessing this issue is described in Section 6.1.11 of this scoping report.

### **3.14 POTENTIAL CUMULATIVE IMPACTS**

This section provides a description of potential cumulative impacts that the proposed operation may contribute to considering other identified land uses which may have potential environmental linkages to the land concerned.

All identified impacts in the preceding sections will be considered in a cumulative manner such that the impacts of the current PPM mining activities and those potentially associated with the redesign/repositioning of surface infrastructure will be assessed cumulatively.

## 4 PROJECT ALTERNATIVES

This section describes land use or development alternatives, alternative means of carrying out the operation, and the consequences of not proceeding with the proposed operation.

The main project alternatives to be considered include:

- alternative land use;
- project infrastructure alternatives; and
- the “no-go” alternative.

### 4.1 LAND USE ALTERNATIVES

In accordance with the current land use in the vicinity of the proposed project area (see section 2.4.3) the area proposed for the pit extension, associated facilities and repositioning of surface infrastructure could, as an alternative to the project, be used for cultivation, grazing, wilderness or mining activities.

During the consultation process the following concerns were raised:

- loss and deterioration of communal arable and grazing land;
- deterioration of water quality and reduction in quantity as a result of the proposed additional mining areas which could impact on surrounding and downstream agricultural land uses;
- the direct and indirect losses to the proposed heritage park (dangerous game corridor and non-dangerous game area) neighbouring agricultural land

When considering the post rehabilitation the land use alternative considered to date includes the flooding of the partially backfilled and rehabilitated open pit for use by the surrounding communities and incorporation into the heritage park areas.

The method to be used for assessing land use alternatives is outlined in section 6.3 of the scoping report.

### 4.2 PROJECT ALTERNATIVES

#### 4.2.1 ALTERNATIVE DEVELOPMENT SITES

The location of the increased footprint of the open pit is fixed due to geological constraints and as such no alternative sites have been considered.

#### 4.2.2 ALTERNATIVE MINING METHODS

PPM is proposing an extension to the current open pit to access the PGM ore body. This proposed method suits the relatively accessible nature of the ore body (approximately 210m at its deepest part). Underground mining of the ore body is not feasible from a geotechnical and financial consideration.

These reasons prevent the IBMR from mining the Sedibelo West mining area (referred to as the mining right abandonment area).

#### 4.2.3 INFRASTRUCTURE LAYOUT ALTERNATIVES

As a result of the larger footprint of the extended Tuschenkomst pit and the location of the upper and lower sections of the Wilgespruit, bridge and haul road infrastructure locations have been positioned to avoid or minimise impacts on these sensitive areas. The repositioned surface infrastructure will be located within the mine boundary and as a result no alternative sites have been considered.

#### **Alternative road diversions, haul road routes, bridge crossings of the Wilgespruit**

PPM is also considering three road diversion alternatives (See Figure 3) that will link into the abovementioned network, to accommodate the proposed expansion of the pit. These roads fall outside of the mining areas. The proposed road diversion alternatives being considered are as follows:

- Alternative 1: P50-1 Route A
  - a. Connecting P50-1 at entrance to Sedibelo to intersection with previous Z536 dirt road
  - b. 3.3km long and 20m wide
  - c. Gravel surface
- Alternative 2: P50-1 Route B
  - a. Connecting P50-1 west of Legkraal to P50-1 near PPM mine entrance
  - b. 7.5km long and 20m wide
  - c. Gravel surface
- Alternative 3: P50-1 Route C
  - a. Connecting D531 intersection to Magalane to P54-1 north west of Mothlabe
  - b. +- 7km long and 20m wide
  - c. Gravel surface

SLR was provided with a conceptual alignment for the haul road network over the project site. This road network will be constructed away from the open mining operation on the eastern side of the extended Tuschenkomst pit and will be used to transport ore and waste rock to the appropriate stockpiles (i.e. WRD or the PPM Plant). The haul roads will be extended as the pit advances and the road will be constructed outside the expansion limits of the extended Tuschenkomst pit. The haul roads will be constructed of suitably sized and compacted waste rock. The proposed network of haul roads on the project site will be approximately 5-10km long and 30m wide on average to accommodate traffic and tipper trucks.

The proposed haul roads on the farm Wilgespruit 2JQ are an internal road system and do not link with these outside roads.

#### **Location of surface infrastructure within the project site**

The infrastructure being referred to is:



- the storm water dam/s; and
- the telecommunications tower/s.

The changes to surface infrastructure will be positioned to optimise activities at the mine. The infrastructure layout in the consolidated BID document and in the listed activity application to DEDECT is a conceptual layout. One of the purposes of this document is to locate the position of the infrastructure where the mining operations are still able to function efficiently and continually improve while considering and having the least impact on the environment.

#### **Alternative water supply**

As the proposed project will not result in an increase in production capacity at the mine, no additional water is required during the operational phase. This water will be obtained from existing sources and as a result no alternative water supply options have been identified.

#### **Alternative power supply**

As part of the proposed project it is planned to establish an overhead electricity supply to the proposed telecommunications tower. No alternatives were considered as the overhead lines would follow the favoured haul road alternative and branch off to the telecommunications tower site foreseeable future.

#### **Alternative energy usage**

PPM has allowed for a solar panel and batteries to supply the back-up power to the telecommunications tower in the event of a power outage. This panel and battery backup system will supply power to only the critical operational elements at the tower.

### **4.3 LAND DEVELOPMENTS WHICH MAY BE AFFECTED BY THE PROPOSED PROJECT**

This section provides a description of land developments identified by the community or IAPs that are in progress and which may be affected by the proposed mining operation.

All objections, issues and concerns raised throughout the Scoping Phase have been captured into the issues and concerns report provided in Appendix D.

### **4.4 IAP PROPOSALS TO ADJUST PROJECT PLAN**

This section provides a list and description of proposals made in the consultation process to adjust the operational plans of the mine to accommodate the needs of the community, landowners and IAPs.

During the consultation process, concerns were raised regarding the destruction of the arable and grazing areas as a result of the open pit mining. In addition concerns were raised about the impact the mines (temporally and spatially) are and would impact future conservation initiatives (i.e. Pilanesberg national Park and proposed Heritage Park Corridor).

**ALL OBJECTIONS, ISSUES AND CONCERNS RAISED THROUGHOUT THE SCOPING PHASE HAVE BEEN CAPTURED INTO THE ISSUES AND CONCERNS REPORT PROVIDED IN APPENDIX B: STAKEHOLDER DATABASE**

Appendix C.

#### **4.5 THE “NO-GO” OPTION**

This section provides information in relation to the consequence of not proceeding with the proposed mining operation.

The assessment of this option requires a comparison between the options of proceeding with the project with that of not proceeding with the project. The assessment of this option requires input from the investigations described in Section 6 so that the full extent of environmental, social and economic considerations can be taken into account.

The method to be used for assessing this option is outlined in Section 6.3 of the scoping report.

#### **4.6 PROJECT PLAN**

A description of the most appropriate procedure to plan and develop the proposed project is provided in Section 3.1.

##### **4.6.1 AVOIDANCE OF POTENTIAL IMPACTS**

This section provides information on the applicant’s response to the findings of the application process and the possible options to adjust the mine project proposal to avoid potential impacts identified in the consultation process.

The overall project team, which consists of PPM, various environmental specialists and SLR, aims to develop the project plan in a manner which will prevent impacts to the socio-economic, cultural and biophysical environment. Should any impacts related to the amended project scope be unavoidable, the emphasis will be on impact minimisation and mitigation. The input provided by the relevant EIA specialists will be used to inform any required changes to the project plan during the EIA phase of the project.

##### **4.6.2 PROJECT PLAN TO AVOID POTENTIAL IMPACTS**

This section describes the most appropriate procedure to plan and develop the proposed mining operation with due consideration of the issues raised in the consultation process.

The PPM project team, together with SLR and the environmental specialists aim to develop the project plan that will prevent negative impacts and enhance the positive impacts to the socio-economic, cultural and biophysical environment.

Should impacts relating to the project scope be unavoidable, the emphasis will be on impact minimisation and mitigation. The input provided by the relevant EIA specialists will be used to inform any required changes to the project plan during the EIA phase of the project.

## **5 DESCRIPTION OF THE PROCESS OF ENGAGEMENT OF IAPS, INCLUDING THEIR VIEWS AND CONCERNS**

### **5.1 INFORMATION SHARING**

This section describes the information provided to the community, landowners and IAPs to inform them in sufficient detail of what the mining operation will entail on the land, in order for them to assess what impact the operation will have on them or the use of the land.

#### **5.1.1 BACKGROUND INFORMATION DOCUMENT (BID)**

A BID was compiled and distributed by hand (during the consultative meetings) and in some cases e-mailed to IAPs and authorities on the project's public involvement database. This database was developed using the database from previous and ongoing projects in the Tuschenkomst project area and supplemented with information on IAPs provided in the scoping meetings. The purpose of the BID is to inform IAPs and authorities about the proposed project, the environmental assessment process, possible environmental impacts, and means of providing input into the environmental assessment process. Attached to the BID is a registration and response form, which provides IAPs with an opportunity to submit their names, contact details and comments on the project. A copy of the BID is provided in Appendix C.

#### **5.1.2 NOTIFICATION**

The landowner of the farm Rooderand 42JQ is the Republic of South Africa (care of the DRDLR). The DRDLR was notified telephonically and in writing, by hand delivered letters, of the proposed project. In addition, the neighboring landowners were informed of the proposed project via telephone and in writing, by hand delivered letters. Proof of these notifications is provided in Appendix C.

Attempts were made by SLR to inform the land users of Rooderand 42 JQ and Wilgespruit 2 JQ of the proposed project through a social scan process. This involved site visits where SLR personnel tried to meet with these land users directly and attempted meetings with the 'Dibeso' (community elders). These attempts were however unsuccessful with the land users not being willing to discuss the project with SLR personnel due to disputes between these communities and the BBKTA. SLR will continue to engage with the BBKTA structures during the EIA in order to consult with these land users.

Proof of these notifications is provided in Appendix C. To date, SLR has not been able to contact the landowner of the farm Koedoesfontein 42 JQ, Mr Palane Tchinangoe. We have been informed by the Bakgatla-Ba-Kgafela Tribal Council that Mr Tchinangoe is deceased, however this is yet to be confirmed and the inheritor is still to be identified.

Site notices in English and Setswana were placed at key conspicuous positions in and around the project site and surrounding villages. Block advertisements were placed in The Sowetan and The Rustenburg Herald newspapers on 27 January 2012. Photographs of the site notices and copies of the newspaper advertisements are provided in Appendix C.

IAPs were notified of the proposed project and the public meetings via meetings with the BBKTA, sms, BIDs and loud hailing in the affected communities.

### 5.1.3 SCOPING MEETINGS

The following scoping meetings were held for the proposed project:

- fourteen general scoping meeting were held from 5 to 13 March 2012 at various locations surrounding the proposed project site, namely;
  - Saulspoort / Moruleng
  - Lesetlheng
  - Manamakgoteng
  - Lekutung
  - Sefikile / Spitskop
  - Mononono
  - Kgamatha / Lesobeng
  - Lekgraal / Bofule
  - Ramasedi
  - Ntswana-le-Metsing
  - Motlhabe
  - Ngweding
  - Magalane
  - Magong
- one authorities meeting was held on 6 March 2012; and
- three focused meetings were held on 29 February 2012, 6 March 2012 and 7 March 2012, respectively;
  - FES,
  - Pilanesberg National Park and surrounding industry; and
  - Black Rhino Game Reserve.

It should be noted that the Lesetlheng community meeting was arranged at the Lesetlheng Primary School on 5 March 2012 at 13:00. Upon arrival the Lesetlheng community requested that this meeting be postponed until the 17 March 2012 and requested that the directors of PPM, IBMR, Richtrau as well as the leaders of the BBKTA be invited to this meeting. The meeting (17 March 2012) did not take place as it was not possible for the directors and leaders of the various entities to attend and another meeting was

subsequently arranged for 19 May 2012. The community requested that the meeting be moved to 27 May 2012. Due to civil unrest in the area the May meeting was cancelled by Platmin South Africa. A meeting between representatives from the Lesetlheng community and SLR was arranged for 28 June 2012; however SLR was instructed to cancel the meeting. The meeting between SLR and Lesetlheng representatives took place on 26 July 2012. One of the outcomes of the meeting was a formal request, in writing, from SLR to meet with the Lesetlheng community as part of the EIA consultation process. It is understood that the Lesetlheng representatives communicated the request to the community, who responded by stating that they do not want to participate in the consultation process until various conditions have been met. Copies of this correspondence are included in Appendix C.

As the potential exists for the three mining projects described in the Introduction of this report to operate as one mining operation, a presentation was given at each meeting that provided basic information for the three projects and the environmental process being followed. The same presentation was given at all of the meetings. At this early stage in the project, limited information is available regarding the project description as the project is still in the design phase. The meeting was therefore focussed on:

- informing IAPs about the proposed project;
- informing IAPs about the stakeholder engagement process and how IAPs can have input into the process;
- providing information about the baseline environment and obtaining agreement thereon;
- providing information about the potential impacts of the project and obtaining agreement thereon; and
- providing an opportunity for IAPs to raise issues and concerns. These issues and concerns have been clearly documented and used to inform the Plan of Study for the EIA Phase.

Meeting attendance registers, minutes, the meeting presentation and the issues and concerns report are provided in Appendix C and Appendix D respectively.

#### **5.1.4 REVIEW OF SCOPING REPORT**

The scoping report will be subjected to public review in September and October 2012. Full copies of the scoping report will be available for public review at the following venues:

- Villages immediately surrounding the project area, including Lesetlheng; Manamakgoteng; Lekutung;
- Sefikile/Spitskop; Mononono; Kgamatha/Lesobeng; Lekgraal/Bofule; Ramasedi; Ntswana-le-Metsing;
- Motlhabe; Ngweding; Magalane; Magong;
- Bakgatla-Ba-Kgafela traditional offices in Saulspoort;
- Moses Kotane Local Municipality in Saulspoort;
- Rustenburg public library;
- Black Rhino Game Reserve;
- Pilanesberg Platinum Mine;
- SLR's offices in Johannesburg; and

- electronically on a CD, on request.

Summaries of the report will be sent by post or e-mail to all IAPs and authorities on the project's public involvement database. These summaries will be made available at all the public venues and with the relevant community representatives.

## **5.2 IAPs CONSULTED DURING SCOPING PHASE**

This section discusses which of the identified communities, landowners or lawful occupiers and other IAPs were in fact consulted during the Scoping Phase.

All IAPs registered on the project database have been consulted and have received:

- an invitation to the scoping meeting and/or a focussed meeting (via email, post or sms);
- the BID;
- the opportunity to provide input and raise issues and concerns via written comments directed to SLR, or at the scoping meeting.

All full list of IAPs consulted is provided in Appendix B.

## **5.3 IAP VIEWS ON EXISTING ENVIRONMENT**

All views, issues and concerns raised throughout the Scoping Phase with regard to the existing cultural, socio-economic or biophysical environment have been captured into the issues and concerns report provided in Appendix D.

## **5.4 IAP VIEWS ON POTENTIAL IMPACTS**

All views, issues and concerns raised throughout the Scoping Phase on how the existing cultural, socio-economic or biophysical environment could potentially be impacted upon by the proposed mining operation have been captured into the issues and concerns report provided in Appendix D.

## **5.5 OTHER IAP CONCERNS**

All views, issues and concerns raised throughout the Scoping Phase have been captured into the issues and concerns report provided in Appendix D. Issues pertained to:

- procedural issues related to the public consultation process;
- technical issues related to the mine design and planned infrastructure ;



- socio-economic issues specifically what benefits could be expected and employment of local people as well as the influx of people into the area. Another significant issue raised was internal tribal issues between several communities and the traditional authority;
- surface water pollution and loss of water used for domestic and agricultural use;
- groundwater pollution;
- land use changes;
- air quality, specifically dust generation;
- traffic and related safety hazards as well as requests for road upgrading;
- blasting safety hazards and cracking of houses;
- safety hazards related to open excavations;
- heritage resources, specifically potential impacts on graves;
- potential health impacts on people and livestock;
- noise pollution;
- sensitive biodiversity;
- soil and land capability; and
- impacts of the existing mining operations.

## **5.6 MEETING MINUTES AND RECORDS OF CONSULTATIONS**

Copies of the scoping meeting attendance register, minutes, the scoping meeting presentation and the issues and concerns report is provided in Appendix D.

## **5.7 IAP OBJECTIONS**

Objections to the proposed project were received and have been recorded in the issues and concerns report included in Appendix D.

## **6 FURTHER INVESTIGATIONS AND EIA PLAN OF STUDY**

This section describes the nature and extent of further investigations required in the Environmental Impact Assessment Report, including any specialist reports that may be required, and sets out the proposed approach to the EIA/EMP phase.

### **6.1 FURTHER INVESTIGATIONS**

The proposed terms of reference for further investigations required for the completion of the EIA study are discussed below. The results of these studies will be collated into a combined EIA and EMP report.

#### **6.1.1 GEOLOGY**

It is proposed that no further specialist investigations are required. Meetings will be held with the PPM mining and rock mechanics team to discuss the potential impacts of fluctuating water levels as well as rapid draw-down of water on the stability of all the side walls of the partially backfilled pit. The assessment and detailed management measures will be provided in the EIA and EMP report by SLR.

#### **6.1.2 TOPOGRAPHY**

It is proposed that no further specialist investigations are required. The assessment and detailed management measures will be provided in the EIA and EMP report by SLR.

#### **6.1.3 SOIL AND LAND CAPABILITY**

It is proposed that the separate investigation will be conducted by Earth Science Solutions (Pty) Ltd. The investigation will have the following objectives:

- to identify and map the soils occurring in the proposed Tuschenkomst pit extension project area;
- to analyse, classify and characterise soil samples that are collected in the field;
- to detail land capability and use within the project area; and
- to have input, together with SLR and PPM, into the project alternatives, the soil management measures and rehabilitation going forward.

#### **6.1.4 LAND USE**

##### **6.1.4.1 Impact on existing surrounding agricultural, tourism and residential uses**

It is proposed that no specialist investigations are required. Meetings will be held with the BBK, PPM, DRDLR and NWPTB to discuss the detail of this issue, prior to the assessment and detailed management measures will be provided in the EIA and EMP report by SLR.

#### **6.1.4.2 Sterilisation of mineral reserves**

It is proposed that no further investigations are required. Meetings will be held with the PPM mining, technical and geotechnical teams to confirm that the mining method or proposed pit flooding does not sterilise remaining ore reserves from future mining. The assessment and detailed management measures will be provided in the EIA and EMP report by SLR.

#### **6.1.5 NATURAL VEGETATION AND ANIMAL LIFE (FLORA AND FAUNA)**

It is proposed that a separate, detailed biodiversity (terrestrial flora and fauna study together with riparian delineation) investigation will be conducted by Natural Scientific Services CC. The biodiversity investigation will have the following objectives:

- to identify, map and describe each different habitat in the proposed Tuschenkomst pit extension project area through desktop and field studies (faunal trapping and motion cameras together with visual confirmation);
- to record species linked to each habitat (i.e. through sampling methods referred to above);
- record red data and conservation important species within the project site;
- to rank each habitat type based on conservation importance (in terms of provincial biodiversity priorities) and ecological sensitivity;
- to identify potential impacts on the biodiversity; and
- to have input, together with SLR and PPM, into project alternatives, biodiversity management measures and rehabilitation going forward.

#### **6.1.6 HYDROLOGY (SURFACE WATER)**

It is proposed that SLR will conduct the surface water study. This study will make use of the information gathered by AGES Consulting. The study will cover the Tuschenkomst, Rooderand and Wilgespruit farms and its objective will be to perform a hydrological assessment taking into consideration the impact of such a project will have on the environment as well as affected downstream users. This will be achieved by undertaking the following in accordance with the relevant legislation/guidance including GN 704 and BPG1:

- site visit and field work;
- review of the baseline information (i.e. rainfall and evaporation data and the appropriateness thereof);
- establishing the extent of the catchment hydrology (i.e. affected catchments based on their physical characteristics including the mean annual runoff [MAR]);
- determine the rainfall intensities per month (1hr, 24hr, 24hr 1:50, 24hr 1:100);
- determine flood peaks for recurrence intervals of 1:20, 1:50 and 1:100 years and the regional maximum flood (RMF);
- delineate the 1:50 and 1:100 year flood lines on relevant watercourses;

- identification and assessment of potential impacts of the development on surface water (quantity and quality);
- development of relevant management and mitigation measures including a detailed storm water management plan; and
- provide input, together with SLR and the technical project team into project alternatives and surface water management measures going forward.

#### **6.1.7 GROUNDWATER**

It is proposed that a detailed investigation be conducted by AGES for the study area. The investigation has the following objectives:

- to review and evaluate existing data and perform a site description (desk study) on the geology and geohydrology of the project site;
- to conduct a hydrocensus survey to determine the groundwater and borehole locations, status, depth, distribution, use and owners in the area;
- to sample groundwater features to determine the groundwater quality distribution and baseline water quality data;
- to compile geological, geohydrological and hydro-chemical GIS maps of the aquifer system that indicates the groundwater (and water quality) in relation to the geology;
- to conduct geophysics for positioning boreholes;
- to drill boreholes to verify aquifer classification;
- to assist with the identification of water supply options;
- to model the dewatering and pollution impacts of the proposed project; and
- to have input, together with SLR and the PPM project team, into project alternatives and groundwater management measures going forward.

#### **6.1.8 ENGINEERING DESIGN**

Epoch Resources (Pty) Ltd will compile the detailed design for the Tuschenkomst Waste rock Dump (WRD). The investigation will include the following tasks:

- confirmation of the design criteria for the residue deposit;
- the development of a detailed and conceptual site layout to serve various timeframes of the project;
- development of stage capacity relationships and development strategies for the facility;
- design of works required for the development, operation, and closure of the residue deposit; and
- provide input, together with SLR and the PPM technical project team into project alternatives, groundwater management measures and rehabilitation going forward.

AGES and PPM are currently carrying out a detailed geohydrological study for the area and this will be used to inform the EIA and EMP phase of this study. The following information will be used during the

impact assessment phase of this project to better understand the engineering, pit flooding and engineering design of the mining and backfilling schedules around the proposed project:

- AGES (October 2011): Pilanesberg Platinum Mines – Amendment Extended Tuschenkomst open Pit post Operational Study; Report Number AS-R-2010-10-19.
- AGES (October 2011): Pilanesberg Platinum Mines - Tuschenkomst Pit Flooding Option Analysis; Report Number AS-R-2010-12-10.
- AGES (October 2011): Pilanesberg Platinum Mine - Tuschenkomst Pit Flooding Option Analysis, Engineering and Closure Scenario Analysis; Report Number AS-R-2010-12-10.
- AGES (October 2011): Pilanesberg Platinum Mine - Tuschenkomst Pit Flooding Option Analysis, Tuschenkomst Open Pit Post Operational Study; Report Number AS-R-2010-12-10.

#### **6.1.9 AIR QUALITY**

Airshed Planning Professionals (Pty) Ltd will conduct a study to update the existing air dispersion model. The investigation will include the following tasks:

- baseline assessment of the existing conditions (i.e. determining the day-night and seasonal wind patterns in the project area);
- identification of the potential receptors;
- quantify the emissions from the proposed project in an emissions inventory;
- to assess the potential impacts of the emissions on receptors (i.e. to predict the potential additional health and nuisance impact of emissions on sensitive receptors in the area); and
- to recommend management measures where required, in consultation with SLR, PPM and relevant IAPs.

#### **6.1.10 NOISE**

It is proposed that no further specialist investigations are required. The assessment and detailed management measures will be provided in the assessment provided in the EIA and EMP report by SLR.

#### **6.1.11 VISUAL ASPECTS**

Newtown Landscape Architects, in collaboration with PPM will be carrying out a visual investigation in order to compile a set of conceptual closure diagrams for this project. The assessment and detailed management measures will be provided in the assessment provided in the EIA and EMP report by SLR.

#### **6.1.12 ARCHAEOLOGICAL, CULTURAL AND HERITAGE RESOURCES**

A Phase I heritage impact assessment was conducted by Dr Julius Pistorius (October, 2011). The study met the following objectives:

- identification and mapping (through literature review and field work) all heritage resources in the proposed Tuschenkomst pit extension project area;

- assessment of the significance of the identified resources;
- assessment of the impact of the proposed Tuschenkomst pit extension project on the heritage resources.

This study will provide input, together with SLR, PPM and relevant IAPs into project alternatives and heritage resources management measures going forward.

#### **6.1.13 PALEONTOLOGICAL RESOURCES**

Professor Bruce Rubidge, of BPI for Palaeontological Research, undertook a desktop assessment of paleontological resources in November 2011. The study had the following objectives:

- to identify (through literature review) the likelihood of paleontological resources occurring in the proposed Tuschenkomst pit extension project area (i.e. through according to the regional and local geological formations);
- to through literature review, identify, all paleontological resources in the proposed Tuschenkomst pit extension project area;
- to assess the impact of the proposed Tuschenkomst pit extension project area on the paleontological resources; and

This study will provide input, together with SLR, PPM and relevant IAPs into project alternatives and paleontological resources management measures going forward.

#### **6.1.14 TRANSPORT SYSTEMS**

It is proposed that the detailed investigation be conducted by Siyazi Gauteng (Pty) Ltd. The investigation has the following objectives:

- gather all necessary baseline information (literature review and telephonic discussions);
- confirm current status of road network and intersections under investigation (site visit and manual traffic counts);
- conduct trip assignments (i.e. generation and distribution calculations);
- conduct detail traffic analyses (i.e. modelling);
- establish the impact of the three proposed road diversions on the existing traffic and trip durations; and
- have input, together with SLR and PPM into appropriate mitigation measures for project alternatives and traffic related management measures where required.

#### **6.1.15 SOCIO-ECONOMIC ISSUES**

It is proposed that Managing Transformation Solutions (Pty) Ltd (MTS) and Strategy4Good will conduct a social and economic impact assessment for the proposed project. The objectives of the study are as follows:

- obtain and process all the necessary baseline data through a desktop study;

- obtain the necessary background information including the Moses Kotane local Municipality local Economic Development Plan [LED] and the PPM Social and Labour Plan [SLP] to provide context;
- establish the authenticity of the baseline data through interviews with the relevant role-players;
- analyse and assess the socio-economic and socio-political impacts of the proposed project on the surrounding environment (including the potential benefits of the flooded pit on the surrounding area);
- assess the impacts on future land use alternatives and at the same time carry out a cost benefit analysis of the proposed mining operation; and
- have input, together with SLR and PPM into appropriate mitigation measures for project alternatives and socio-economic related management measures where required.

Strategy4 Good as part of the broader economic assessment will carry out the following elements of the assessment:

- carry out a comparative, alternative, economic land use analysis as per the requirements of Regulation 50 of the MPRDA;
- analyse the costs and benefits of the alternative economic land use alternatives; and
- discuss the sustainability of the alternative economic land use alternatives.

## 6.2 METHODOLOGY FOR THE ASSESSMENT OF ENVIRONMENTAL ISSUES

The proposed method for the assessment of environmental issues is set out in Table 12 below. This assessment methodology enables the assessment of environmental issues including: cumulative impacts, the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

**TABLE 12: CRITERIA FOR ASSESSING IMPACTS**

*Note: Part A provides the definition for determining impact consequence (combining severity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D.*

<b>PART A: DEFINITION AND CRITERIA*</b>		
<b>Definition of SIGNIFICANCE</b>	<b>Significance = consequence x probability</b>	
<b>Definition of CONSEQUENCE</b>	<b>Consequence is a function of severity, spatial extent and duration</b>	
<b>Criteria for ranking of the SEVERITY of environmental impacts</b>	<b>H</b>	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	<b>M</b>	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.
	<b>L</b>	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	<b>L+</b>	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	<b>M+</b>	Moderate improvement. Will be within or better than the recommended level. No observed reaction.

	<b>H+</b>	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
<b>Criteria for ranking the DURATION of impacts</b>	<b>L</b>	Quickly reversible. Less than the project life. Short term
	<b>M</b>	Reversible over time. Life of the project. Medium term
	<b>H</b>	Permanent. Beyond closure. Long term.
<b>Criteria for ranking the SPATIAL SCALE of impacts</b>	<b>L</b>	Localised - Within the site boundary.
	<b>M</b>	Fairly widespread – Beyond the site boundary. Local
	<b>H</b>	Widespread – Far beyond site boundary. Regional/ national
<b>PART B: DETERMINING CONSEQUENCE</b>		

**SEVERITY = L**

<b>DURATION</b>	Long term	<b>H</b>	Medium	Medium	Medium
	Medium term	<b>M</b>	Low	Low	Medium
	Short term	<b>L</b>	Low	Low	Medium

**SEVERITY = M**

<b>DURATION</b>	Long term	<b>H</b>	Medium	High	High
	Medium term	<b>M</b>	Medium	Medium	High
	Short term	<b>L</b>	Low	Medium	Medium

**SEVERITY = H**

<b>DURATION</b>	Long term	<b>H</b>	High	High	High
	Medium term	<b>M</b>	Medium	Medium	High
	Short term	<b>L</b>	Medium	Medium	High
			<b>L</b>	<b>M</b>	<b>H</b>

Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
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**SPATIAL SCALE****PART C: DETERMINING SIGNIFICANCE**

<b>PROBABILITY (of exposure to impacts)</b>	Definite/ Continuous	<b>H</b>	Medium	Medium	High
	Possible/ frequent	<b>M</b>	Medium	Medium	High
	Unlikely/ seldom	<b>L</b>	Low	Low	Medium
			<b>L</b>	<b>M</b>	<b>H</b>
<b>CONSEQUENCE</b>					

**PART D: INTERPRETATION OF SIGNIFICANCE**

<b>Significance</b>	<b>Decision guideline</b>
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

\*H = high, M= medium and L= low and + denotes a positive impact.

## 6.3 METHODOLOGY FOR THE ASSESSMENT OF PROJECT ALTERNATIVES

### 6.3.1 ASSESSMENT OF THE “NO-GO OPTION”

The assessment of the implications of the “No-Go option” will require a high level comparison between the existing situation without the project and the possible future situation with the project, as assessed in



the EIA and EMP report. This comparison will take existing and future impacts into account, including both positive and negative impacts. Additional discussion is included in Section 4.5 of the scoping report.

### **6.3.2 ASSESSMENT OF PROJECT ALTERNATIVES**

The realistic alternatives and associated assessment criteria for choosing between these alternatives have been discussed in Section 4 of the scoping report. The proposed methodology for the assessment of these alternatives is a relative comparison that also applies the assessment method described above to each of the listed assessment criteria, where possible.

## **6.4 CLOSURE COST ESTIMATE**

SLR will review and update PPM's closure cost estimate using the DMR model and guideline document.

## **6.5 WAY FORWARD FOR SCOPING**

The way forward for the remainder of the scoping phase is as follows:

- distribute the scoping report and a summary thereof for review by the IAPs, the DMR and other regulatory authorities;
- receive comments from IAPs and other regulatory authorities;
- forward comments received to the DMR;
- update the scoping report with IAP comments and forward to DEDECT and DEA; and
- receive comments from the DMR, DEA and DEDECT.

## **6.6 PLAN OF STUDY FOR THE EIA PHASE**

### **6.6.1 EIA PHASE OBJECTIVES**

The main objectives of the EIA phase are to:

- assess project alternatives;
- assess the potential environmental and social impacts of the project;
- identify and describe procedures and measures that will mitigate potential negative impacts and enhance potential positive impacts;
- liaise with IAPs including relevant government departments on issues relating to the proposed development to ensure compliance with existing guidelines and regulations;
- undertake consultations with IAPs and provide them with an opportunity to review and comment on the outcomes of the environmental assessment process and acceptability of mitigation measures;
- develop an environmental management plan and a conceptual closure/decommissioning plan; and
- provide measures for on-going monitoring (including environmental audits) to ensure that the project plan and proposed mitigation measures are implemented as outlined in the detailed EIA.

### 6.6.2 EIA PROJECT TEAM

The proposed EIA project team is outlined in Table 13 and is similar to the team used for the scoping phase with the inclusion of additional specialists.

**TABLE 13: EIA PROJECT TEAM**

Team	Name	Designation	Tasks and roles	Company
Project management	Hylton Allison	Project manager	Management of the assessment process, stakeholder engagement and report compilation.	SLR
	Victoria Tucker	Project administrator		
	Ntsako Baloyi	Stakeholder engagement assistant	Assistance with public participation process	
	Brandon Stobart	Project reviewer	Report and process review	
Specialist investigations	Susan Abell	Ecologist	Ecological survey	Natural Scientific Services
	Ian Jones	Soil specialist	Soil and land capability assessment	Earth Science Solutions
	Julius Pistorius	Archaeologist	Heritage assessment	Private
	Bruce Rubidge	Palaeontologist	Palaeontological assessment	BPI for Palaeontological Research
	Hanlie Liebenberg-Enslin	Air quality specialist	Air emissions model	Airshed Planning Professionals
	Paul van der Westhuizen	Traffic specialist	Traffic impact assessment	Siyazi
	Stephan Meyer	Groundwater specialist	Hydrocensus, groundwater model and water balance	AGES
	Mark Bollaert and Stephen van Niekerk	Hydrologist and engineer	Surface water management plan and flood lines	SLR
	Adel Mabelane/Bheki Mdakane	Social scientist	Socio-economic assessment	MTS
	Gerrie Muller	Economist	Economic assessment	Strategy4Good
	Stephen van Niekerk	Engineer	Closure cost estimate	SLR
Guy Wiid	Engineer	Tailings and waste rock design	Epoch Resources	

### 6.6.3 EIA/EMP PHASE ACTIVITIES

An overview of the EIA/EMP phase and corresponding activities are outlined in Table 14.

**TABLE 14: EIA/EMP ACTIVITIES**

Objectives	Corresponding activities and estimated dates
<i>Further investigations (July to October 2012)</i>	
<ul style="list-style-type: none"> <li>Describe the affected environment</li> <li>Define potential impacts</li> <li>Give management and monitoring recommendations</li> </ul>	<ul style="list-style-type: none"> <li>Investigations by technical project team and SLR of issues identified during the scoping stage including investigations into alternatives.</li> </ul>
<i>EIA and EMP phase (November 2012 to August 2013)</i>	
<ul style="list-style-type: none"> <li>Assessment of potential environmental impacts</li> <li>Design requirements and management and mitigation measures</li> <li>Receive feedback on application</li> </ul>	<ul style="list-style-type: none"> <li>Compilation of EIA and EMP report.</li> <li>Distribute EIA and EMP report to IAPs and other regulatory authorities for review (January 2013).</li> <li>Public feedback meetings with IAPs (if required)(February 2013).</li> <li>Record comments (March 2013).</li> <li>Forward IAP comments to DMR (March 2013).</li> <li>Forward final EIA and EMP report to DEDECT and DEA (March 2013)</li> <li>Circulate record of decision to all registered IAPs (second half of 2013).</li> </ul>

### 6.6.4 STAGES OF CONSULTATION WITH THE COMPETENT AUTHORITY IN EIA PHASE

Proposed consultation meetings for the EIA phase include:

- a site visit and meeting with the DMR, DEDECT, DEA and DWA (if requested); and
- a general authorities meeting at the end of the EIA phase to present the main findings of the EIA prior to submission of the EIA and EMP report (if requested).

### 6.6.5 PUBLIC INVOLVEMENT PROCESS IN EIA PHASE

The proposed public involvement process can be separated into focussed and general involvement. Each of these is described below:

#### **Focussed involvement**

As part of the various investigations that form part of the EIA tasks focussed meetings with certain IAPs will be held, as required. These meetings will be arranged and facilitated by SLR.

### **General involvement**

As with the scoping report, full copies of the EIA and EMP report will be distributed to the agreed venues and summaries will be distributed to registered IAPs. Full copies of the report will also be provided electronically (on a CD) on request.

At the end of the review period, public feedback meetings will be arranged (if requested). The purpose of these meetings would be as follows:

- to provide IAPs with a final chance to submit comments on the EIA and EMP report; and
- to provide IAPs with an opportunity to discuss the outcomes of the EIA and EMP report.

All comments received from IAPs in the review period will be forwarded to the DMR.

Once the DMR, DEDECT and DEA have issued their respective decisions, the IAPs will be notified by fax, e-mail, and post in accordance with the instructions from the departments.

## **7 SUMMARY AND CONCLUSIONS**

The scoping phase of the EIA catering for the proposed extension of the Tuschenkomst open pit and associated surface infrastructure at the PPM open pit platinum mine has been completed. The potential impacts identified in this scoping report will be investigated by various studies to be conducted in the next phase of the EIA.

**Hylton Allison**  
Project Manager

**Alex Pheiffer (PR.SCI.NAT)**  
Reviewer

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**B: IDENTIFICATION OF THE REPORT**

<b>Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises the results of consultation as contemplated in Section 16 (4) (b) or 27 (5) (b) of the Act as the case may be</b>	
<b>Full names and surname</b>	<b>Dean Riley</b>
<b>Identity number</b>	<b>(Included in submission to the DMR)</b>
<b>Signature</b>	

**APPENDIX A: PROOF OF NEMA AND NEM:WA APPLICATIONS**

**APPENDIX B: STAKEHOLDER DATABASE**

**APPENDIX C: INFORMATION SHARING WITH STAKEHOLDERS**

- Correspondence with relevant authorities
- Proof of landowner notification
- Site notice in English and Setswana, and photographs showing the placement of site notices
- Advertisements
- Notification letter sent to IAPs and ward councillors
- Background Information Document (in English and Setswana)
- Initial meetings with BBKTA, Kgomas, and Moses Kotane Local Municipality
- Scoping meeting minutes and attendance registers
- Completed registration forms / comments received
- Correspondence with representatives from the Lesetlheng community

**APPENDIX D: ISSUES AND CONCERNS REPORT**



## RECORD OF REPORT DISTRIBUTION

<b>Project Number:</b>	B007-19
<b>Title:</b>	Pilanesberg Platinum Mines Proposed Tuschenkomst Pit Extension
<b>Report Number:</b>	1
<b>Proponent:</b>	Pilanesberg Platinum Mines Pty Ltd

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