Scoping Report for the Amendment to the Bafokeng Rasimone Platinum Mine (BRPM) Environmental Management Programme (EMPR) to include Proposed North Shaft Phase 3 Project Ventilation Shaft, North West Province

Report Prepared for

Royal Bafokeng Platinum

DMR Reference Number: RDNW (KL) 6/2/2/391

Report Number 420937/Scoping Report EMPR Amendment

Report Prepared by

srk consulting

September 2012

Scoping Report for the Amendment to the Bafokeng Rasimone Platinum Mine (BRPM) Environmental Management Programme (EMPR) to include Proposed North Shaft Phase 3 Project Ventilation Shaft, North West Province

Royal Bafokeng Platinum

SRK Consulting (South Africa) (Pty) Ltd.
Suite 47 Rynlal Building
320 The Hillside
Lynwood
Pretoria
0081

South Africa

e-mail: lcoetser@srk.co.za
website: www.srk.co.za

Tel: +27 (0) 12 361 9821
Fax:+27 (0) 12 361 9912

SRK Project Number 420937/Scoping Report EMPR Amendment

September 2012

Peer Reviewed by:

Compiled by:

A. Caddick, L. Coetser
Environmental Consultants

Email: lcoetser@srk.co.za

Dr. Andrew Wood
Partner

Authors:

A. Caddick, Dr. Laetitia Coetser

Executive Summary

The Bafokeng area is situated in the Northern Western Province approximately 120 km north west of Johannesburg. Immediately outside the Bafokeng boundaries are Sun City to the north and Rustenburg to the south. Royal Bafokeng Platinum Limited (RBPlat) Bafokeng Rasimone Platinum Mine (BRPM) is located approximately 37.5 km north of Rustenburg and 8 km east of the town Boshoek, in the Rustenburg local and Bojanala Platinum district Municipalities, North West Province. The villages of Rasimone and Robega are situated in the mine surface lease area. Chaneng, Boshoek and Mafenya are situated in the surrounding areas.

Mining at BRPM started in 1998. BRPM consists of two decline shafts namely North Shaft and South Shaft and BRPM forms part of the existing joint venture agreement between Royal Bafokeng Resources and Rustenburg Platinum Mines Limited. BRPM`s North Shaft mining operation was focused on the upper levels. These levels reserves are starting to be depleted. The crews from these top levels have gradually moved down on the Merensky reef. As a consequence of the progression of the mining activities from the upper levels to the lower Merensky levels, as well as changes to the Mines Health and Safety Regulations in respect of ventilation of underground working areas, BRPM is required to establish additional ventilation shaft capacity to service its underground mine operations. The proposed ventilation shaft system is known as the North Shaft Phase 3 Ventilation Shaft.

The establishment of the North Shaft Phase 3 Ventilation Shaft is specifically motivated to comply with the mines occupational health and safety requirements, which are required to continue the underground mining operations at BRPM.

In the absence of compliance with the mining ventilation regulations, BRPM could be required to cease operations, with direct impact on the current and potential future employees at BRPM. Approximately 6 600 people are currently dependent on BRPM for employment and income, which include sub-contractors, the wider community and service providers.

The proposed North Shaft Phase 3 Ventilation Shaft is a vertical passage that will be connecting the underground workings with surface atmosphere, functioning to move fresh air underground to ensure a safe working environment for the underground mine workers. Ventilation shafts are positioned at specified locations along the underground workings to optimise ventilation capacity, whilst considering energy demands and disturbance that may accrue to attempt to ventilate over prolonged distances. Therefore this exact position was recommended. Positioning of the raise-boring ventilation shaft is also limited by the current underground mining operations.

North Shaft Phase 3 Ventilation Shaft is located ± 9 km from the Pilanesberg National Park and 4 km from the Magaliesberg Protected Environment Park on portion 1 of the farm Boschkoppie 104 JQ. Other villages in the area are Chaneng and Rasimone to the South of the proposed ventilation shaft. The proximity of the proposed Ventilation Shaft to sensitive environments is illustrated in Figure 7-2 and Figure 7-4.

There are three alternative site locations for the proposed ventilation shaft, all located on the eastern edge of the Robega Village, on opposite sides, outside the floodlines of the Matlopyane stream. The shaft positions are between 20 and 100 m from existing Robega resident’s houses as illustrated in Figure 7-4.

Environmental authorisation is required in terms of the Mineral and Petroleum Resources Development Act (MPRDA, Act 28 of 2002) (MPRDA), before the proposed project may commence. An Environmental Impact Assessment (EIA) will be undertaken and an Environmental Management Programme (EMP) will be prepared for this project by independent environmental

consultants (SRK Consulting), and submitted to the DMR, the decision-making authorities, on behalf of the holder of the converted mining right, in this case Rustenburg Platinum Mines Limited.

Who is Conducting the EIA/EMP?

SRK Consulting has been appointed as an independent consultant to conduct the EMPR amendment process as well as undertaking the public involvement component.

Environmental Authorisation Process

The EIA process will be conducted in terms of Section 102 of the MPRDA and Regulation 48 – 52.

The process that will be followed to deliver an EMPR amendment will include:

- MPRDA Section 102 Application;
- EIA/EMP process; and
- A Public Participation Process.

Description of the Proposed Development

The North Shaft Phase 3 Ventilation Shaft project will include the following:

- A downcast raise-boring ventilation shaft which will be drilled to a depth of approximately 460 m. The shaft diameter will be 4.1 m, which will supply fresh air underground for the Phase 3 workings;
- The associated civil and structural installations on surface;
- A 4 m wide gravel access road, to the raise-boring ventilation shaft will be built from an existing gravel road with in the Robega Village.

Motivation for the Proposed Project

The proposed North Shaft Phase 3 Ventilation Shaft is absolutely vital as it ensures a safe working environment for the underground mine workers. If the proposed North Shaft Phase 3 Ventilation Shaft does not proceed, it will lead to a health risk for the BRPM Phase 3 underground mine workers. As a result, the Phase 3 development cannot proceed which will ultimately lead to job losses and a contribution to the Gross Domestic Product of South Africa. The North Shaft's Merensky operation will extend the profitability and life of the BRPM by 14 years to 2032, and in return create additional employment.

The construction of a Ventilation Shaft has become a priority. Without the Ventilation Shaft project, BRPM will not be able to continue current production rates and social demands, resulting in unemployment of a large sum of residents in the Rustenburg area and surrounding communities. Employment at BRPM will be prolonged in parallel to the prolongation of BRPM Phase 3 expansion.

Environmental Assessment Process

Approach to the Environmental Impact Assessment

An EIA seeks to identify the environmental consequences of a proposed project from the beginning and helps to ensure that the project, over its life cycle, will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

Two parallel processes are being followed during the Scoping Phase being an Environmental Technical process and the Public Participation process.

Public Participation Process

Public Involvement Activities Undertaken to Date

Activities that have been undertaken for the public involvement process during the Scoping Phase are:

- Development of stakeholder database;
- Preparation of documentation for notification of stakeholders (background information document, invitation letters, media advertisement and site notices) and distribution of these;
- Public notification;
- Public comment period of Background Information Document;
- Public meeting; and
- Collation of comments received into a Comments and Response Report; and

Anticipated Impacts

A Ventilation Shaft photograph is provided on the cover of the Scoping Report to illustrate what is proposed to be developed for North Shaft Phase 3 Ventilation Shaft.

Element of Environment	Potential Impact Descriptions
Socio-Economic	As a consequence of changes to the Regulations in respect of ventilation of underground working areas, BRPM has been required to establish an additional ventilation shaft to service its existing BRPM underground mine development operations. North Shaft Phase 3 Ventilation shaft is motivated to comply with the mines occupational health and safety requirements, which are required to continue the underground mining operations at BRPM. In the absence of compliance with the mining ventilation regulations, BRPM mine could be required to cease operations, with direct impact on the current and potential future employees at the BRPM Mine. Approximately 6 600 people are currently dependent on BRPM for employment and income, which include sub-contractors, the wider community and service providers.
Topography	During construction there will be boring equipment on site, as this equipment will not be a permanent feature the impact on topography during construction is not significant. During operational phase there will be an exhaust canopy on the surface, in relation to the existing surrounding environment, the impact is expected to be insignificant.
Climate	No impact is anticipated on climate as a result of the ventilation shaft during the construction or the operational phase of the project.
Groundwater	The footprint area of the North Shaft Phase 3 Ventilation Shaft development is 49 m^2. The surface concrete works to locate the drilling rig, and subsequently house the canopy of the ventilation shaft will be appropriately engineered and sealed to prevent the ingress of rainwater into the shaft as it is developed and subsequently operated, according to established construction activity management controls applied by BRPM for their existing ventilation shafts. The shaft itself will be will also be appropriately engineered and sealed to prevent the ingress of groundwater into the shaft as it is developed and subsequently operated. Construction activity management will ensure that any materials handling does not pose a material risk to soil, surface water and groundwater pollution.
Surface water	The footprint area of the North Shaft Phase 3 Ventilation Shaft development is 49 m^2. The surface concrete works to locate the drilling rig, and subsequently house the canopy of the ventilation shaft will be engineered and sealed to prevent the ingress of rainwater into the shaft as it is developed and subsequently operated, according to established construction activity management controls applied by BRPM for their existing ventilation shafts. The construction activity area itself will also be appropriately engineered and sealed to provide diversion of run-off from up-gradient areas and minimise and contain dirty stormwater arising during construction activities. Once construction has been completed the construction activity area will be rehabilitated and the operational shaft area reduced in size. The Matlopyane non perennial stream is located approximately 37 m from the shaft construction footprint and 76 m from the Ventilation Shaft. The North Shaft Phase 3 Ventilation Shaft falls outside the ambient of a Water Use License. It is however not envisaged that the proposed activities will impact the stream. Mitigation and Management measures will however be provided during the

	EIA/EMP phase. Construction activity management will ensure that any materials handling does not pose a material risk of surface water pollution.
Geology	No impacts anticipated on geology as a result of the establishment of the Ventilation Shaft. Appropriate geological and rock mechanics will be applied to the design of the North Shaft Phase 3 Ventilation Shaft to ensure safe construction and subsequent operation, according to established construction activity management controls applied by BRPM for their existing ventilation shafts.
Air Quality	There is a potential for minimal dust generation during the construction phase of the ventilation shaft, which will be managed according to established construction activity dust suppression controls applied by BRPM. The North Shaft Phase 3 Ventilation Shaft should have no material air quality impact during operation.
Noise and Vibration	Construction activity at the project site will result in some localised noise which will be managed according to established construction activity management controls applied by BRPM for their existing ventilation shafts. Construction activities at the site would be short-term and no significant adverse impacts related to noise or vibration during construction is expected.
Visual	The North Shaft Phase 3 Ventilation Shaft is within the operational area of numerous significant mining and processing plant activities. The footprint area of the North Shaft Phase 3 Ventilation Shaft will be 49 m^2 and the height above ground level of the top of the ventilation canopy at approximately 3-5 m. The construction and subsequent operation of North Shaft Phase 3 Ventilation Shaft should have no direct material impact on the visual environment.

Proposed Process for the Remainder of the Studies

Public Involvement

The following is recommended with regard to the public consultation to be conducted during the EIA/EMP phase of the study:

- A progress feedback letter will be sent to all identified or registered stakeholders following the completion of the Scoping Phase to thank those that participated to date and keeping them informed of the next steps in the project;
- Department of Mineral Resources (DMR) will then make comment with regard to the way forward for the assessment phase of the study and this work will then proceed accordingly;
- A EIA/EMP Report will then be generated for the Proposed Development and this will, once again, be made available for public comment for a 30 day period;
- In addition a public meeting will be held with stakeholders and summary reports and an updated Issues Report will be distributed to all registered stakeholders;
- Thereafter the report will be finalised and submitted to DMR for a decision regarding the project;
- The environmental authorisation decision will be communicated to all key stakeholders as well as those that have participated in the study to date; and
- The project decision-making process will ensure that affected parties' inputs are being considered. This does not mean that the development should be stopped by public involvement, but rather that decisions be guided by peoples' input.

Conclusion

As a consequence of the progression of the mining activities from the upper levels to the lower Merensky levels, as well as changes to the Mines Health and Safety Regulations in respect of ventilation of underground working areas, BRPM is required to establish additional ventilation shaft capacity to service its underground mine operations. The ventilation shaft system for this EMPR Amendment is known as the North Shaft Phase 3 Ventilation Shaft.

The establishment of the North Shaft Phase 3 Ventilation Shaft is specifically motivated to comply with the mines occupational health and safety requirements, which are required to continue the underground mining operations at BRPM.

In the absence of compliance with the mining ventilation regulations, BRPM could be required to cease operations, with direct impact on the current and potential future employees at BRPM. Approximately 6 600 people are currently dependent on BRPM for employment and income, which include sub-contractors, the wider community and service providers.

The footprint area of the proposed North Shaft Phase 3 Ventilation Shaft is very small, nominally <50 m^2. It is not anticipated that the construction and subsequent operation of the North Shaft Phase 3 Ventilation Shaft will have any material detrimental environmental impacts, and that construction and operational activities can be mitigated and managed to provide appropriate environmental protection and pollution control. Similar Ventilation Shafts for the same ventilation purpose have been constructed within the surrounding villages with no detrimental consequences. The same basic principles will be employed with the construction and operation of the North Shaft Phase 3 Ventilation Shaft.

No fatal flaws have been identified during the Scoping Phase of this project; however, in accordance with the MPRDA Regulations, the proposed authorisation process will provide for appropriate consideration of potential positive and negative socio-economic and environmental impacts, and consideration of appropriate mitigation and management measurements required. These impacts will be quantified and the proposed mitigation and management assessed in the EIA/EMP phase of the project to determine whether the severities of the impacts are reduced to an acceptable level.

YOUR COMMENT ON THE SCOPING REPORT

This Scoping Report will be available for comment for a period of 30 days from **Thursday 13th September 2012 to Monday 14th October 2012**. Copies of the Scoping Report, and the Comments and Response Report, are available at the following public places and upon request from the public participation office:

PUBLIC PLACE	LOCALITY	TELEPHONE
Rustenburg Public Library	Rustenburg	(014) 590 3060/3295
Bojanala Platinum District Municipality	Rustenburg	Bojanala Platinum District Municipality
Robega Village Community Office	Robega	N/A
Chaneng Village Post Office	Chaneng	(014) 558 2117
BRPM Main Office Reception	BRPM	(014) 573 1300
Royal Bafokeng Administration Offices	Phokeng	(014) 566 1200
SRK Website	Pretoria	(012) 361 9821

The following methods of public review of the Scoping Report are available:

- Completing the comment sheets enclosed with the report;
- Additional written submissions; and
- Comment by email, fax or telephone.

DUE DATE FOR COMMENT

Monday 14th October 2012

Please submit comments to the public participation officers:

Donne Chetty / Ilke Nel
SRK Consulting
P.O. BOX 35290, MENLO PARK, 0102
Phone : (012) 361 9821
Fax : 086 514 9768
Email: ddutoit@srk.co.za / acaddick@srk.co.za

Table of Contents

List of Tables

List of Figures

Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd (SRK) by RBPlat. The opinions in this Report are provided in response to a specific request from RBPlat to do so. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

List of Abbreviations

Term / Abbreviation	Description
BIC	Bushveld Igneous Complex
BID	Background Information Document
BMU	Biodiversity Management Units
BRPM	Bafokeng Rasimone Platinum Mine
CARA	Conservation of Agricultural Resources Act (no. 43. Of 1983)
CrVI	Hexavalent Chromium
dBA	Decibels
DEA	Department of Environmental Affairs
DEAT	National Department of Environmental Affairs and Tourism
DEIAR	Draft Environmental Impact Assessment Report
DMR	Department of Mineral Resources
DWA	Department of Water Affairs
DWEA	Department Water and Environmental Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Programme
EMPR	Environmental Management Programme Report
GA	General Authorisation
GAN	Global Africa Network
GDP	Gross Domestic Product
GG	Government Gazette
GN	General Notice
GNR	General Notice Regulation
Ha	Hectares (measure of area, 10 000 square metres)
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IWULA	Integrated Water Use License Application
km	Kilometre (measure of distance)
kV	kilo-volts
masl	Meters Above Sea Level
MHSA	Mine, Health and Safety Act No 29 of 1996
MPRDA	Mineral and Petroleum Resources Development Act, Act 28 of 2002
mtpa	Million tons per annum
MVA	Mega-Volt Ampere
NEM:AQA	National Environmental Management: Air Quality Act, Act 39 of 2004
NEMA	National Environmental Management Act, Act 107 of 1998
NEMWA	National Environmental Management: Waste Act, Act 59 of 2008
NGO	Non-Governmental Organisation
NHRA	National Heritage Resources Act No 25 of 1999
Ni	Nickel
NWA	National Water Act No 36 of 1998

Term / Abbreviation	Description
NW-DEDECT	North West Department: Economic Development, Environment, Conservation and Tourism
NWPG	North West Provincial Government
OEL	Occupational Exposure Limits
OEL-STEL	Occupational Exposure Limit - Short term Exposure Limit
PAIA	Promotion of Access to Information Act (No. 2 of 2000)
PGM	Platinum Group Metals
POS	Plan of Study
RBPlat	Royal Bafokeng Platinum
REM	Remainder
ROM	Run of mine
RLS	Rustenburg Layered Suite
SAHRA	South African National Heritage Resources Agency
SMS	Short Message Service
SO_2	Sulphide
TSP	Total suspended particulate matter
TWA	Time Weighted Averages
UG2	Upper Group 2
WUL	Water Use Licence

1 Introduction and Scope of Report

The Bafokeng Rasimone Platinum Mine's (BRPM) underground operation needs a Ventilation Shaft for the North Shaft Phase 3 project, to ensure a safe working environment for the underground workers. The operating depths for the phase 3 workings are between 50 and 500 m below surface. The proposed Ventilation Shaft is a vertical passage that will be connecting the North Shaft Phase 3 underground workings with surface atmosphere, functioning to transfer fresh air underground and eradicate stale air.

BRPM has an existing Environmental Management programme (EMPR), dated 11 February 1998, for its Mining Operation (Reference Number: (RDNW (KL) 6/2/2/391), in terms of Section 39 of the Minerals Act, 1991 (Act No. 50 of 1991) and an approved Water Use Licence (WUL) (License No: 26032490). An amendment to the current EMPR is required to incorporate the specific details of the proposed Ventilation Shaft.

BRPM must comply with Section 102, read with the environmental requirements covered by Section 37 – 39 and regulations 50 & 51 of the MPRDA, which stipulates the environmental process to be followed when requiring an amendment of the existing EMPR. The amendment to the mine's existing EMPR must be compiled and approved by the Department of Mineral Resources (DMR). This Scoping Report forms part of the EMPR amendment process.

SRK Consulting (SA) (Pty) Ltd has been appointed as the independent environmental consultant, by Royal Bafokeng Platinum (RBPlat), to conduct the environmental authorisation for the proposed project.

This report serves the objectives of the Scoping Phase and will be finalized after the required 30 day review period for Interested and Affected Parties (I&AP's) and key Organs of State.

This report is the Scoping Report which includes a background description of the proposed project including an overview of the Environmental Impact Assessment (EIA) process, together with public participation followed to date. A baseline description of the current environmental status quo as well as the identification of potential environmental issues and impacts which have been identified is summarized in this report.

This Scoping Report serves to document the results of work undertaken during the first phase, the Scoping Phase, of this project. It will be submitted to the lead regulatory authority, DMR, for approval. The EMPR amendment process will include the following:

- A Scoping Phase;
- EIA/EMP phase;
- MPRDA Section 102 Application; and
- A Public Participation Process.

The North Shaft Phase 3 Ventilation Shaft project will include the following:

- A downcast raise-boring ventilation shaft which will be drilled to a depth of approximately 460 m. The shaft diameter will be 4.1 m, which will supply fresh air underground for the Phase 3 workings;
- The associated civil and structural installations on surface;
- A 4 m wide gravel access road, to the raise-boring ventilation shaft will be built from an existing gravel road with in the Robega Village.

1.1 Report Structure

This Scoping Report has been prepared to meet the requirements of the MPRDA, and includes information on the following:

- The approach adopted for the Scoping Phase of the study;
- The proposed developments at BRPM;
- Listed activities that require authorization;
- The baseline environment within which these developments are proposed;
- Anticipated environmental, social and cultural impacts;
- Alternatives that have been considered as part of the scoping phase of the study;
- The proposed scope for the assessment phase of the EIA/EMP;
- Conclusions of the scoping phase.

1.2 Study Objective

The objectives of the scoping phase are to:

- Contextually understand the overall project and project area;
- Identify stakeholders and future engagements;
- Identify key issues and anticipated impacts that require investigation through the undertaking of specialist studies; and
- Set the terms of reference for the specialist studies for the next phase (Undertaking of the EIA and development of the EMP).

Based on the need to meet the above mentioned objectives, an approach for the Scoping Phase has been developed which:

- Takes cognizance of the regulatory requirements in terms of NEMA, Act 107 of 1998, MPRDA, and the National Water Act, Act 36 of 1998 (Act 36 of 1998) (NWA) and any other acts where applicable;
- Allows for a flexible and appropriate public involvement programme;
- Meets the requirements of DMR;
- Makes use of existing information wherever possible (i.e. existing EMPs, EIAs and specialist studies);
- Allow for public comment on the Scoping Report;
- The involvement of key specialists early in the project (during the Scoping Phase) so as to facilitate the identification of fatal flaws and inform project alternative decisions.

2 Details of Applicant

The BRPM was originally launched through a joint venture between RBPlat Limited and Anglo American Platinum Limited. In January 2010, the operational management was ceded from Anglo Platinum to RBPlat in fulfilment of this joint venture agreement.

RBPlat consists of two operations, namely BRPM and Styldrift Mine, which exploit the platinum group metals mineralisation on the Boschkoppie, Frischgewaagd and Styldrift farms. The BRPM operation includes two twin decline shaft complexes, namely the North and South shafts.

As mentioned in Section 2.2, the affected farm is owned by the Royal Bafokeng Nation (RBN) (portion 1 of the farm Boschkoppie 104 JQ). BRPM has an existing EMPR, dated 11 February 1998, for its Mining Operation, in terms of the Minerals Act (Ref No: RDNW (KL) 6/2/2/391).

2.1 Name and Address of Operation's Owner and Operation's Mine Manager/Responsible Person

2.1.1 Name and Address of owners of the mine and mining authorisation

RBPlat Management Services Pty (Ltd) acting as agent for BRPM JV, an unincorporated Joint Venture between Royal Bafokeng Resources (Pty) Limited (RBR) and Rustenburg Platinum Mines Limited (RPM).

Royal Bafokeng Platinum Management Services Pty (Ltd)	
PO Box 2283	Tel: (011) 530 8040
Fourways	Fax: (011) 530 8049
2055	
Republic of South Africa	

2.1.2 Name and Address of Mine Manager/Responsible Person

Mr Glenn Harris (General Manager: BRPM)	
Private Bag X82025	Tel: 014 573 1479
Rustenburg	
0300	
Republic of South Africa	

2.1.3 Project Proponent

For the purpose of this EMPR amendment the following people in Table 2-1 may be contacted at BRPM.

Table 2-1: Details of the proponent

Details	**Name**	
	Glenn Harris	Tshego Tyira
Designation	General Manager: BRPM	Environmental Coordinator
Telephone	+27 (0) 14 573 1479	+27 (0) 14 573 1528
Cell		+27 (0) 83 259 1053
E Mail	glennh@Bafokengplatinum.co.za	ttyira@bafokengplatinum.co.za

2.2 Name and Address of the Owner of the Land and the Title Deed Description

The surface area that might be affected by the proposed projects and Title Deed description are given in Table 2-2.

Table 2-2: Details of the properties affected by the proposed project

Farm name	Extent	Farm number	Portion	Owner	Address
Boschkoppie	1929.2242 H	104	Portion 1	Royal Bafokeng Nation	PO Box 1 Phokeng 0335

3 Details of the Environmental Assessment Practitioner

The study has been undertaken by SRK Consulting SA (Pty) Ltd. SRK commenced its practises in 1974 as has since been involved in a large variety of environmental studies. SRK Consulting is a South African founded international organisation of professionals providing a comprehensive range of consulting services to natural resource industries and organisations. SRK's Johannesburg and Pretoria offices are staffed with over 300 professional consultants operating in a range of disciplines, mainly related to the environment, water, social and mining sectors. Back-up and peripheral expertise is available within these offices for all environmental projects.

The project team consists of the following members in Table 3-1 and can be contacted at SRK Consulting:

Table 3-1: Details of the EIA / EMP project team

Details	Name				
	Andrew Wood	Laetitia Coetser	Andrew Caddick	Ilke Nel	Donne Chetty
Designation	Project Partner and Reviewer	Project Manager	Project coordinator, public participation and report preparation.	Project coordinator, public participation and report preparation.	Public participation Coordinator
Address	PO Box 55291, Northlands 2116	PO Box 35290 Menlo Park 0081	PO Box 35290 Menlo Park 0081	PO Box 35290 Menlo Park 0081	PO Box 35290 Menlo Park 0081
Telephone	(011) 441-1237	(012) 361 9821	(012) 361 9821	(012) 361 9821	(012) 361 9821
Fax	(011) 880 8086	(012) 361 9912	(012) 361 9912	(012) 361 9912	(012) 361 9912
Cell	082 600 6071	083 655 8362	072 981 0182	072 697 6266	071 671 9753
E Mail	awood@srk.co.za	lcoetser@srk.co.za	acaddick@srk.co.za	inel@srk.co.za	ddutoit@srk.co.za

3.1 Independence of the Environmental Assessment Practitioners

SRK consulting hereby declares independence of the proposed RBPlat.

The independence of the Environmental Assessment team is aimed at reducing the potential for bias in the process of the EIA as associated authorizations. SRK Consulting, nor any Sub consultants and specialists, have any correlation or interest in the proposed project or future/present developments influenced by this project in any way.

The project partner and reviewer (Dr Andrew Wood) and the Project Manager (Dr. Laetitia Coetser) are appropriately qualified and registered with the relevant professional bodies. Dr. Coetser is registered as Professional Natural Scientists with the South African Council of Natural Scientific Professions. Dr. Wood is also registered as a Chartered Biologist. The CV's of the key SRK Consulting staff members for this project can be found in Appendix A.

Project experience is summarised in Appendix B.

4 Legal and Policy Framework

The following Act and Regulations are applicable during the construction of the proposed project and associated infrastructure. Environmental legislation applicable to the BRPM operations includes, but is not limited to, the following:

- The Constitution of the Republic of South Africa (No. 108 of 1996);
- Mineral and Petroleum Resources Development Act (No. 28 of 2002);
- Mine Health and Safety Act (Act No. 29 of 1996);
- Mine Health and Safety Act (Act No. 29 of 1996) Regulations in terms of Section 98 of the Act;
- Mine Health and Safety Amendment Act (Act No. 74 of 2008);
- National Environmental Management Act (No. 107 of 1998);
- National Environmental Management Air Quality Act (No. 39 of 2004);
- National Environmental Management Waste Act (No. 59 of 2008);
- The National Water Act (No. 36 of 1998);
- The National Heritage Resources Act (25 of 1999);
- Hazardous Substance Act (No. 15 of 1973); and
- Promotion of Access to Information Act (No. 2 of 2000).

The proposed project will not trigger requirements of any other environmental legislation, thus only an EMPR amendment in terms of Section 102 of the MPRDA, and regulations 47 – 74 printed in terms of the MPRDA will be applied for.

4.1 The Constitution of the Republic of South Africa

In terms of Section 24 of the Constitution of the Republic of South Africa (Act No. 108 of 1996) (Constitution), everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for benefit of present and future generations, through reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while prompting justifiable economic and social development. The needs of the environment, as well as affected parties, should thus be integrated into overall project management in order to fulfil the requirements of Section 24 of the Constitution.

4.2 The National Environmental Management Act (107 of 1998)

The NEMA as amended in 2010 contains a set of principles in Chapter 2 that govern environmental management. These principles must be adhered to and taken into consideration during the impact assessment phase, construction and operation phases of a project. Regardless of the listed activities GNR 543 - 547 printed in terms of the NEMA, which will not be triggered for the project, the principles of NEMA should still be taken into consideration.

The Environment is defined in the NEMA as the following;

"environment " means the surroundings within which humans exist and that are made up of –

1. *the land, water and atmosphere of the earth;*
2. *micro – organisms, plants and animal life;*
3. *any part or combination of (i) or (ii) and the interrelationship among and between them; and;*
4. *the physical, chemical, aesthetic and cultural, properties and conditions of the foregoing that influence human health and wellbeing;*

Section 28 of the NEMA should be adhered to during all times of construction, operation and decommissioning of the proposed project. Section 28 applies to all activities taking place, and not solely focused on the listed activities being applied for.

Section 28 (1) states that:

"Every person who causes or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or reoccurring. If pollution cannot be prevented then appropriate measures must be taken to minimize or rectify such pollution."

4.3 EIA Regulations (GNR 543)

The EIA Regulations (GNR 543) were promulgated in terms of Sections 24 of the NEMA, to manage the process, methodologies and requirements for the undertaking of an EIA. The EIA Regulations were published on 18 June 2010 and came into effect on the 2nd August 2010. The EIA regulations (GNR 543) stipulate that the applicant for a development listed under GNR 544, 545 or 546 must appoint an Independent Environmental Assessment Practitioner (EAP) to manage the EIA process. It defines two broad categories of EIA, namely a Basic Assessment and a Full EIA. A Basic Assessment is generally intended for smaller scale projects, or activities whose impacts are well understood and can be easily managed. The process for a Basic Assessment is described in regulations 21 to 25 of GNR 544 and the environmental consultant must conduct a public participation process as set out in regulation 54 to 56.

A full EIA as stipulated in GNR 544 consists of a Scoping and impact assessment phase. This form of an EIA is generally intended for larger scale projects, whereby the environmental impacts are more diverse and extensive thereby a more comprehensive means of impact identification is required. The impacts of such a project may lead to extensive environmental degradation, or solely require a scoping phase in order to assess and identify impacts not easily predicted or identified.

The process for a full EIA is described in regulations 26 to 35 of GNR 543 and the environmental consultant must conduct a scoping process, followed by an impact assessment process, with public participation as set out in regulations 54 to 56.

4.3.1 Listed Activities

No listed activities are envisaged that could potentially be triggered in terms of Government notices No GNR 544, 545 or 546.

4.4 The National Environmental Management: Waste Act, Act 59 of 2008

The National Environmental Management: Waste Act, Act 59 of 2008 (NEMWA, Act 59 of 2008) was implemented on 1 July 2009 and Section 20 of the Environment Conservation Act 73 of 1989, under which waste management was previously governed, was repealed. The main objectives of the NEMWA, Act 59 of 2008 are to:

Reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; and to provide for:

1. National norms and standards for regulating the management of waste by all spheres of government;
2. Specific waste management measures;
3. The licensing and control of waste management activities;
4. The remediation of contaminated land; to provide for the national waste information system; and
5. Compliance and enforcement;

The objectives of NEMWA, Act 59 of 2008 involve the protection of health, wellbeing and the environment by providing reasonable measures for the minimization of natural resource consumption, avoiding and minimizing the generation of waste, reducing, recycling and recovering waste, and treating and safely disposal of waste as a last resort.

In general, the act seeks to ensure that people are aware of the impact of waste on their health wellbeing and the environment, and in the process giving effect to Section 24 of the Constitution, in ensuring an environment that is not harmful to health and wellbeing.

Waste is defined in the NEMWA, Act 59 of 2008 as follows:

"waste" means any substance, whether or not that substance can be reduced, re-used, recycled and recovered

a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
b) which the generator has no further use of for the purposes of production;
c) that must be treated or disposed of; or
d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but -
i) a by-product is not considered waste; and
ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.

In terms of the NEMWA, all waste management activities must be licensed. According to Section 44 of the Act, the licensing procedure must be integrated with an environmental impact assessment process in accordance with the EIA Regulations in GNR 543 printed in terms of the NEMA. Government Notice 719, which was implemented on 3rd July 2009, removed all waste management activities from the EIA Regulations GNR 386 and GNR 387, resulting in new NEMA, listed activities namely GNR 544 and GNR 545. Government Notice 718 lists the waste management activities that require licensing. A distinction is made between Category A waste management activities, which require a Basic Assessment, and Category B activities, which require a full EIA (Scoping followed by Impact Assessment). EIA Regulation GNR 543 defines the process requirements that must be followed for Basic Assessment and full EIA.

No listed activities are envisaged that could potentially be triggered by Government Notice R 718 Category A and Government Notice 718 Category B, printed in terms of the NEMWA.

4.5 The Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)

The main objective of the MPRDA is to recognise the sovereignty of the State over all the mineral and petroleum resources in South Africa and to promote equitable access to the country's resources. The MPRDA allows for previously disadvantaged persons to enter the minerals and

petroleum industry and benefit from the exploitation of the country's minerals. This is done through the focus on job creation in the mining industry for previously disadvantaged people. This Act ensures that holders of existing and new mining and production rights contribute towards the social - economic development in the areas in which they operate, promoting economic growth, employment and advance the social and economic welfare of all South Africans.

BRPM has a mining right approved by the DMR for the mining of the Merensky and UG2 reef. The additional Ventilation Shaft required for the continual safe mining of both reefs was however not included within the existing approved EMPR.

In accordance with Section 102 (amendment of rights, permits, programmes and plans) of the MPRDA, an EMPR amendment is required. This process includes assessing the baseline project area, identifying anticipated environmental and socio-economic impacts and developing mitigation measures to alleviate any potential negative impacts associated with the project. Sections 49 – 74 of the MPRDA further define the reporting requirements when undertaking an EMPR amendment process.

To ensure a diligent environmental authorisation process is completed, the said statutory requirements will be met and incorporated into the environmental process and reports. The North West DMR will be the competent authority responsible for authorisation of this EMPR amendment process.

4.6 The National Heritage Resources Act (25 of 1999)

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act 25 of 1999. The enforcing authority for this act is the South African National Heritage Resources Agency (SAHRA). In terms of the Act, historically important features such as graves, trees, archaeology and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. In terms of Section 38 of the National Heritage Resources Act, SAHRA can call for a Heritage Impact Assessment (HIA) where certain categories of development are proposed. The Act also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is deemed adequate, a separate HIA is not required. Should a permit be required for the damage or removal of specific heritage resources, BRPM will submit a separate application for these activities to the SAHRA for approval, should these resources be potentially damaged or removed. The activities identified in the Act as requiring a notification of SAHRA include:

Section 38

(1) (a): "The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;

(c): Any development or other activity which will change the character of a site

- *i. exceeding 5 000 m² in extent ; or*
- *ii. involving three or more existing erven or subdivisions thereof ; or*
- *iii. involving three or more erven or divisions thereof which have been consolidated within the past 5 years; or*
- *iv. the costs of which will exceed a sum in terms of regulations by SAHRA or a provincial heritage resource authority*

The proposed project is located ± 12 Km from the Pilanesberg National Park, 4 km from the Magaliesberg Protected Environment Park; therefore the location is in an area known for its cultural artefacts. The proposed project footprint area has already been fundamentally transformed by the establishment of farming and residential activities over the area, and there is no known formal heritage or sites of cultural interest in the direct footprint area.

4.7 Mine Health and Safety Act (Act No. 29 of 1996)

The Mine Health and Safety Act (No. 29 of 1996) as amended in 2008 aims to provide for protection of the health and safety of all employees and other personnel at the mines of South Africa. The main objectives of the act and subsequent amendments are:

- Protection of the health and safety of all persons at the mines;
- Require employers and employees to identify hazards and eliminate, control and minimise the risks relating to health and safety at the mines;
- Give effect to the public international law obligations of the Republic that concern health and safety at all mines;
- Provide for employee participation in matters of health and safety through health and safety representatives and the health and safety committees at the mines;
- Provide for effective monitoring of health and safety conditions at the mines;
- Provide for enforcement of health and safety measures at the mines;
- Provide for investigations and inquiries to improve health and safety at mines; and
- To promote:
    - A culture of health and safety in the mining industry;
    - Training in health and safety in the mining industry; and
    - Co-operation and consultation on health and safety between the State, employers, employees and their representatives.

The proposed project will be located within the BRPM mining lease area and BRPM will therefore need to ensure that this Act and subsequent amendment regulations are adhered to on site by employees, contractors, sub-contractors and visiting personnel. This is especially pertinent during the construction phase of the North Shaft Phase 3 Ventilation Shaft, as well as the practical requirement for the provision of adequate ventilation to the underground mine workings to enable mining to be undertaken.

The MHSA requires a System of Occupational Hygiene Measurements. The action levels for the implementation of a monitoring program are depicted below:

Section 9.2(2) The employer must establish and maintain a system of occupational hygiene measurements, as contemplated in section 12, of all working places where the following hazard limits prevail:

Airborne pollutants:

- *Particulates > 1/10 of the occupational exposure limit;*
- *Gases and vapours > ½ of the occupational exposure limit;*

Thermal Stress

- *Heat >25,0GC wet bulb and/or >32,0GC dry bulb and/or >32,0GC mean radiant temperature;*
- *Cold <10GC equivalent chill temperature;*

Noise

- *82dBLAeq,8h.*

The Mine Health and Safety act no longer prescribes a minimum air requirement (formerly it was $0.15m^3/s/m^2$ of face area). The regulations now refer to exposure limits. Schedule 22.9(2)(a) provides a comprehensive list of airborne pollutants with its Occupational Exposure Limits (OEL) and Occupational exposure limit - Short term exposure limit (OEL-STEL) as illustrated in Table 4-1.

Table 4-1: Pollutant exposure limits in term of the Mine Health and Safety Act

Substance	OEL		OEL – STEL	
	ppm	mg/m^3	ppm	mg/m3
Carbon Monoxide (CO)	30	35	100	115
Carbon Dioxide (CO	5 000	9 000	30 000	54 000
Nitric Oxide	25	30	35	45
Nitrous Oxide	50	90	-	-
Nitrogen Monoxide	25	30	35	45
Nitrogen Dioxide	3	5	5	9
Silica dust (respirable)	-	0.1	-	-
Coal dust (respirable)	-	2	-	-
Particles not otherwise classified	-	-	-	-
Inhalable particles	-	10	-	-
Respirable particles	-	3	-	-

In light of the above, as the BRPM mine operations expansion, additional ventilation mechanisms (in the form of ventilation shafts) will become necessary in order to adhere to the MHSA.

4.8 National Water Act (Act No. 36 of 1998)

The National Water Act (NWA) is the primary regulatory legislation, controlling and managing the use of water resources as well as the pollution thereof. This act provides for fundamental reformation of legislation relating to water resource use. The preamble to the NWA recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The purpose of the Act is stated, in Section 2 and enforced by the DWA. Section 2 of the Act related to the following:

- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources; and
- Meeting international obligations.

The Act presents strategies to facilitate sound management of water resources, provides for the protection of water resources, and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management.

As this Act is founded on the principle the government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, an industry (including mines) can only be entitled to use water if the use is permissible under the NWA.

In terms of Section 21 of the NWA, no water uses are anticipated as no activities will be done within the 1:100 year flood line or within 100 m from river courses.

4.8.1 GNR.704

This Regulation deals with the control and use of water for mining and related activities aimed at the protection of water resources. It specifically deals with clean and dirty water in a mining environment. BRPM must ensure that all existing infrastructure relating to the GNR.704 complies with this regulation.

4.9 Promotion of Access to Information Act (No. 2 of 2000)

The Promotion of Access to Information Act (No. 2 of 2000) (PAIA) recognises that everyone has a right of access to any information held by the state and by another person when that information is required to exercise or protect any right. The purpose of the Act is to promote transparency and accountability in public and private bodies and to promote a society in which people have access to information that enables them to exercise and protect their right. The EIA / EMP process to be undertaken in terms of MPRDA, with the associated stakeholder consultation process, will be aligned with the PAIA in the sense that all I&AP's will be given an opportunity to register as an I&AP prior to the initiation of the project and all registered stakeholders will in turn be provided a fair opportunity to review and comment on any reports submitted to the competent authority for decision making, in this case the DMR.

4.10 Conservation of Agricultural Resources Act (No 43 of 1983)

The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) aims to provide for control over the utilisation of natural agricultural resources in order to promote the conservation of soil, water resources and vegetation and to combat weeds and invader plants. The Act makes provision for control measures to be applied in order to achieve the objectives of the Act, these measures relate to inter alia:

- Cultivation of virgin soil;
- Utilisation / protection of wetlands, marshes, water sponges, water courses / sources;
- The regulating of the flow pattern of run-off water;
- The utilisation and protection of vegetation;
- The grazing capacity of veld and the number and type of animals;
- The control of weeds and invader plants; and
- The restoration or reclamation of eroded land or land which is disturbed or denuded.

BRPM is an operational mine with both underground and surface mining rights. However, the surface of the mining area is also utilised by the local communities for grazing of their livestock. The proposed project should not be situated in an area which is utilised for grazing by the community's livestock. Nonetheless, BRPM should pay cognisance to the requirements of this Act where applicable.

4.11 Provincial and Municipal Bylaws

The Rustenburg Local and Bojanala Platinum District municipalities as well as the North West Province has developed local bylaws and various policies relating to waste disposal, water, economic development, etc. BRPM must ensure that such policies and bylaws, as far as possible, during the installation and operation of the water treatment plant are adhered to.

4.12 Guidelines

In addition to the above mentioned Acts, the following guidelines will be taken cognisance of during the EIA / EMP phase of the proposed project:

- DEAT. 2002.Integrated Environmental Management, Information series 2: Scoping (Department of Environmental Affairs and Tourism (DEAT. 2002));
- DEAT. 2002.Integrated Environmental Management, Information series 3: Stakeholder Engagement (Department of Environmental Affairs and Tourism(DEAT. 2002));
- DEAT. 2002.Integrated Environmental Management, Information series 12: Environmental Management Plans (Department of Environmental Affairs and Tourism (DEAT. 2002));
- DEA (2010), Companion to the EIA Regulations 2010, Integrated Environmental Management Guideline Series 5, Department of Environmental Affairs;
- DEA (2010), Companion to the EIA Regulations 2010, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs;
- DEA&DP (2010), Guideline on Public Participation 2010, EIA Guideline and Information Document Series;
- DMR, 2002. Guideline for Consultation with Communities and Interested and Affected Parties. As required in terms of Sections 10(1)(B), 22(4)(B), and 39, read together with Regulation 49 (2) of the Mineral and Petroleum Resources Development Act (Act 28 of 2002); and
- DMR, 2002. Guideline for the Compilation of a Scoping Report. As required in terms of Sections 10(1) (B), 22(4) (B), and 39, read together with Regulation 49 (2) of the Mineral and Petroleum Resources Development Act (Act 28 of 2002).

4.13 BRPM Safety Health and Environmental Policy

BRPM's Safety Health and Environmental Policy can be found in Appendix E.

At BRPM our vision is to achieve injury free sustainable production to the benefit of all stakeholders. It is our honest intention to ensure that no person in our care or in the surrounding community suffer any form of harm emanating from our activities. We will minimize the impact to the environment and strive for continuous improvement.

In order to manage these risks, we are committed to:

Abide by the three BRPM Safety Principles namely; Zero Harm mind-set, No repeats and Simple non-negotiable standards.

Implement and maintain the BRPM SHE Management System.

Policy, Leadership and Commitment

BRPM Management will demonstrate leadership and pro-active commitment to issues related to Safety, Health and the Environment.

The owner will make adequate financial and human resources available to implement this policy. Management will continually improve the Safety, Health and Environmental Management System and maintain ISO 14001 and OHSAS 18001 status.

In our rules we will ensure that accountability for Safety, Health and Environment is placed on the senior management level.

At BRPM we will not compromise our Safety, Health or Environmental standards in the quest for other business priorities.

Risk and Change Management

We will identify the significant hazards at BRPM, assess the associated risks, prioritize these risks and then effectively manage it.

Change will be managed by identifying changes to operations, processes, personnel and activities and then to actively address it to minimize the risk.

Legal and other requirements

We will apply Safety, Health and Environmental Standards as required by law and in some cases even go beyond legal requirements to best practice.

All applicable legal, regulatory and other Safety, Health and Environmental requirements will be identified, documented and maintained in a database that is easy accessible to BRPM employees.

Targets, Objectives and Performance Management

We will set appropriate and measureable targets, objectives and goals with performance indicators to measure our compliance regularly.

The Safety, Health and Environmental targets and objectives is part of our overall business planning process and we apply it throughout our operation to ensure continuous improvement.

Training, Awareness and Competence

We will ensure that all employees, including contractor employees are trained and assessed for competence before they are instructed to perform their tasks.

We will promote and create awareness of the significant Safety and Health effects to people and equipment as well as the Environmental impacts of our activities if not managed properly.

We will develop dynamic training material that is improved all the time as new training practices and updated information become available. This will ensure continuous enhancement of the competence of all employees including contractors.

Communication, Consultation and Involvement

The proactive communication, consultation and involvement of all appropriate employees and contractors in matters of safety are imperative.

We will actively develop and maintain channels of communication with relevant stakeholders, including local communities and recognized unions, to enhance mutual understanding in matters of common concern.

Document and Data Control

Maintain an electronic database with all relevant safety information that can be easily identified and that is readily available when access is required.

Operational Control

We will implement effective control measures to manage the identified hazards and associated risks to safety, health and the environment as a result of our activities.

No unsafe act is allowed, this is non-negotiable.

No entry is allowed into an unsafe working place, this is non-negotiable.

Emergency Preparedness and Response

Effective and efficient emergency preparedness systems will be in place to respond to the emergency with the correct assistance on time.

Ensure we have obtained commitments from outside parties to respond appropriately and on time in the case of a major emergency or crisis situation.

Contractor and Partner Management

All contractors and business partners will go through a strict evaluation process where they have to comply with our requirements and commit to undertake their activities in accordance with our standards, legal, regulatory and other safety specifications as prescribed by BRPM in our contractor management policy.

Incident Reporting and Investigations

Reporting and recording of all incidents and accidents, including near hits is compulsory for all employees including contractors.

All reports will be investigated and analysed to determine the root causes. Corrective and preventive actions will be taken and closed out. The learning points will be shared to prevent a repeat.

Monitoring, Audits and Reviews

Safety performance, system effectiveness and equipment applicability is monitored and audited regularly to identify trends for review and revision.

Progress will be measured and assessed to determine compliance and establish applicability and relevance.

Signed by: Glenn Harris

General Manager: BRPM

11 January 2010.

5 Scoping Study Methodology and Objectives

5.1 Scoping Study Methodology

The Scoping Phase was undertaken in line with the requirements of the MPRDA, Section 49 -52. The Scoping Process has included the activities listed below with further detail on key aspects discussed in the following sub-sections.

- Notification of Authorities and stakeholders of the proposed development (22 June 2012 – 23 July 2012);
- Project meetings between RBPlat and SRK Consulting;
- Desktop review of available baseline information including the approved EMPR for BRPM;
- Development of a list of stakeholders;
- A Public Participation meeting with local community members. This meeting was held on 17th July 2012 (Appendix C);
- Record issues raised by stakeholders and compiling an Issues and Response Report (Appendix C);
- Discussions with regulatory authorities to ascertain the effectiveness of the proposed project process during the scoping phase;
- Preparation and distribution of media notices, site notices, background information leaflets and response sheets (Appendix C);
- Collation of comments received following a 30 day comments period into an Issues and Response Report (Appendix C);
- Presentation to the local communities regarding the proposed process that SRK Consulting is adopting to inform the environmental authorization decision (Appendix C);
- Compilation of a Scoping Report (this document) and submission for public review.

5.2 Scoping Study Objective

The objectives of the scoping phase are to:

- Contextually understand the overall project and project area;
- Provide details of the Environmental Assessment Practitioner (EAP) who compiled the report and the relevant experience to carry out scoping procedures;
- Identify stakeholders and future engagements;
- Identify key issues and anticipated impacts that require investigation;
- Describe the proposed activity;
- Identify feasible alternatives that can be selected for further assessment;
- Identify and describe the environment that may be affected by the activities and the manner in which the physical, biological, socio-economic and cultural aspects of the environment may be affected as well as environmental issues and potential impacts, including cumulative impacts;
- Provide information on the methodology that will be adopted in assessing the potential impacts during the EIA / EMP process including a Plan Of Study (POS) for the EIA; and
- Provide details on the stakeholder engagement process followed.

6 Stakeholder engagement

The stakeholder engagement process forms an important part of the Scoping Phase of a project. The Public Participation Process (PPP) is primarily aimed at affording Interested and Affected Parties (I&APs) and Stakeholders the opportunity to gain an understanding of the project. In addition, the purpose of consultation with the landowner, affected parties and communities is to provide them with the necessary information about the proposed project so that they can make informed decisions as to whether the project will affect them.

Additional objectives of Public Participation include the following;

- Providing details on EIA process, as well as the requisite Environmental Authorisation required prior to implementation of the project;
- Allowing I&APs to comment on the contents and findings of the Scoping Report;
- Providing an opportunity for I&APs to give input and comment on the proposed development;
- Allowing I&APs the opportunity to provide suggestions for alternatives and enhanced benefits related to the proposed development;
- Assisting I&APs to raise concerns or matters, and ensuring that the matters brought forward are captured and taken into consideration;
- Providing Interested and Affected Parties (I&APs) with an opportunity to obtain information about the project; and
- Facilitating and ensuring effective public participation.

6.1 Stakeholder database

An electronic stakeholder database was developed using BRPM's existing databases compiled during monthly community meetings with the surrounding communities, as well as from other projects conducted in the area. The database will be maintained for the duration study where the details of stakeholders are captured and automatically updated upon communication to the EAP. The identification, registration, and comments from stakeholders will be an on-going activity (Appendix C) for the stakeholder database.

The I&AP database include, but are not limited to:

- Affected communities in the project area (Appendix C);
- Landowners (Royal Bafokeng Nation) (Appendix C);
- Land Claimants (Appendix C);
- Land occupier (Chaneng Community) (Appendix C);
- The Department of Land Affairs;
- Identified other persons (including on adjacent and non-adjacent properties) whose socio-economic conditions may be directly affected by the proposed project;
- The Local Municipality (The Magisterial District is Rustenburg);
- The relevant Government Departments (including The Department of Land Affairs (DLA), The Department of Water Affairs (DWA) and The Department of Department Economic Development, Environment, Conservation and Tourism (DEDECT)), agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project (Appendix C).

6.2 Site Notices

Sites notices (Size A2: 594 mm X 841 mm) notifying I&APs of the proposed activity were placed in and around the project area (Appendix C).

Notices were put up on at the following areas:

- Entrance gate to the Chaneng Clinic;
- Notice board at the Chaneng clinic;
- Chaneng Village Council Offices;
- Robega Community Offices;
- Rasimone Police Station;
- Rasimone Village Council Offices; and
- Mafenya Middle School (Appendix C).

It should be noted that members from the Chaneng Community prevented the project team from putting up site notices and to distribute flyers in the area. As such, notices in the Chaneng area were only put up one week after the original date of commencement of public participation.

6.3 Background Information Document (BID)

The purpose of the BID was to provide background information on the proposed project, outlining the environmental authorization process and to notify stakeholders of the public meeting. The BID gave the public the opportunity to register as an I&AP.

Flyers and BIDs were placed at the various places to inform residents and local communities of the proposed project. Flyers and BIDs were also provided to the Headman of Chaneng, Mafenya, Robega and Rasimone.

An invitation letter to the public meeting and accompanying BIDs were emailed to I&AP's and key stakeholders. I&AP's whom no e-mail address could be located were sent a Short Message Service (SMS) notifying them of the proposed project, and contact number of SRK Consulting personnel, whereby additional information could be obtained.

6.4 Advertisements

For the proposed project, SRK was required to place an advertisement in a local newspaper (The Herald). Refer to Appendix C for a copy and proof of the newspaper advertisements. The proposed project was advertised in the Rustenburg Herald on the 22nd of June 2012.

6.5 Public Meeting

The initial public meeting was held on the 17th July 2012 at the BRPM protection service offices.

Letters of invitation (Appendix C) to the public meeting were provided via:

- E-mails to all registered I&APs;
- Physical delivery of invites to Headmen of the Chaneng, Mafenya, Robega and Rasimone (Appendix C).

Short message systems (SMS) were also sent to all registered I&APs inviting them to attend the meeting.

In order to provide all community members an opportunity to attend the public meeting, transportation via busses were also arranged from various locations within the different communities.

The aim of the meeting was to inform the public on the proposed project, giving the public technical background on the activities proposed to take place and the environmental process that will be followed. The public meeting gave additional opportunity for the public to register as I&AP's, and raise their concerns, issues and queries relating to the proposed project.

An English PowerPoint presentation was used to illustrate the objectives of the proposed project (Appendix C). The facilitator translated the presentation as well as questions and answers in

Tswana. Flyers were distributed at this meeting in order to provide additional information. Attendance registers were signed by the attendees and the SRK stakeholder database updated accordingly (Appendix C). Meeting minutes are attached in Appendix C.

6.6 Authority Consultation

A meeting will be held with the DMR, following the submission of the Scoping Report.

The technical background to the proposed project, motivation for the proposed project, and the potential environmental impacts will be presented to the authorities to ensure that they are adequately informed on the proposed project.

6.7 Comments and Response Report

A Comments and Response Report was compiled that detailed the outcomes of the authority and stakeholder consultation process. Issues raised during the scoping phase are captured in a Comments and Response Report. This report will be updated on an on-going basis to include any additional I&AP contributions that may be received as the EIA process proceeds, and as the findings of the EIA become available. The Comments and Response Report is attached as Appendix C.

This report recorded the following:

- The person / organization who raised the comments / concerns;
- Where / how the issue was raised; and
- Response to the issue given by the project team.

6.8 Public Review

The Scoping Report will be placed for public comment for a 30 day period from Thursday 13th September 2012 to Monday 14th October 2012 at the following venues:

- Rustenburg Public Library;
- Bojanala Platinum District Municipality;
- Robega Village community offices;
- Chaneng Village post office;
- BRPM main office reception;
- Royal Bafokeng administration offices; and
- SRK Website: www.srk.co.za/publicdocuments.

The Scoping Report will be submitted to the DMR in alignment with the Scoping Report being made available or public comment. Any issues and/or comments on the Scoping Report will be addressed in the EIA/EMP phase of the project and communicated to the DMR.

7 Brief Project Description

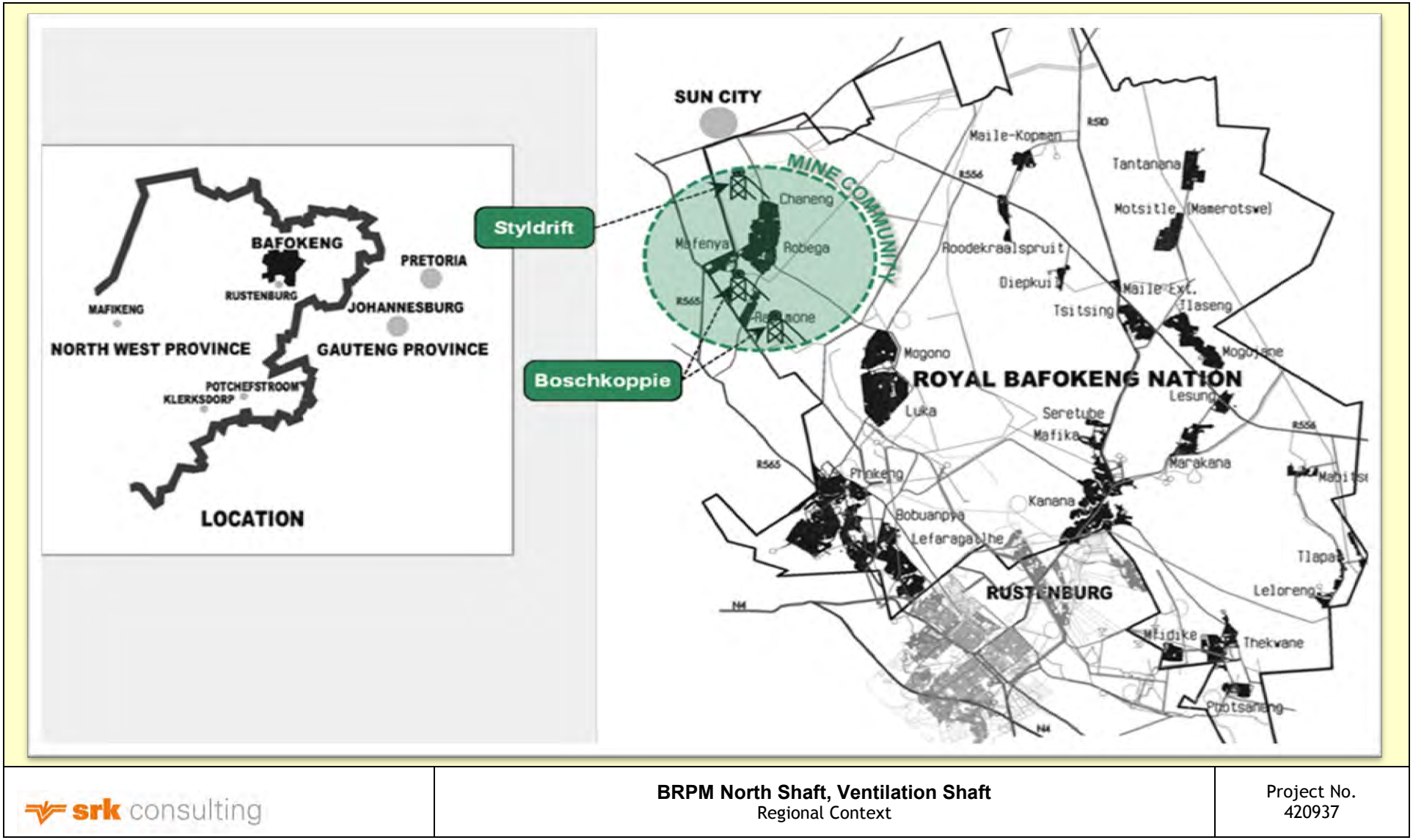
BRPM is situated in the North West Province of South Africa, approximately 120 km north - west of Johannesburg and approximately 30 km north of the town of Rustenburg, within the Bojanala District Municipality. The regional context of the proposed North Shaft Phase 3 Ventilation Shaft is depicted in Figure 7-1. A satellite image is presented in Figure 7-2. Immediately outside the Bafokeng boundaries, Sun City can be found to the north and Rustenburg to the south. BRPM is surrounded by several other mining operations, communities and roads.

The BRPM Styldrift Merensky Phase 1 Shaft Complex is located approximately 12 km to the north, from the proposed Ventilation Shaft. The villages of Rasimone and Robega are situated on the mine surface lease area, while Chaneng, Boshoek and Mafenya are situated in the surrounding areas.

BRPM is situated in the western lobe of the Bushveld Igneous Complex. The Bushveld Igneous Complex (or BIC) is a large layered igneous intrusion within the Earth's crust which has been tilted and eroded and now outcrops around what appears to be the edge of a great geological basin, the Transvaal Basin. Located in South Africa, the BIC contains some of the richest ore deposits on Earth. It underlies an area of some 65,000 km², spanning parts of the Limpopo, North West, Gauteng and Mpumalanga Provinces. (Wikipedia, 2012). There are two economic reefs which occur within the chromotite layers, namely the Merensky and the UG2 reefs. Parallel and about 90 m below the Merensky reef, lies the UG2 reef, with a typical thickness of appropriately 0.7 m.

BRPM is an underground operation and consists of two decline shafts namely North Shaft and South Shaft which have been established to exploit the Merensky platinum group metal ore reserve and UG2. The BRPM Phase 3 project, which was approved in November 2010, provides further replacement of Merensky production at the North Shaft complex, through the extension of the existing decline shaft by an additional five lower levels. The project is an integral part of the BRPM Mine, as it will extend the profitability and life of North Shaft's Merensky operation by 14 years to 2032, and in return create continual employment. Development already started in 2010 and will end in 2017. The operating depths for the current workings are between 50 m and 500 m below surface. Figure 7-3 illustrates a typical isometric view of an underground mining operation within the Merensky reef.

Although the proposed North Shaft Phase 3 Ventilation Shaft does not trigger any listed activities in terms of the NEMA, the principles of this Act will be taken cognisance of in terms of Section 28 of the NEMA. The MPRDA requires that any changes made to infrastructure at a mining operation should be approved in terms of this act. An amendment to the current EMPR is required to incorporate the specific details of the proposed project.

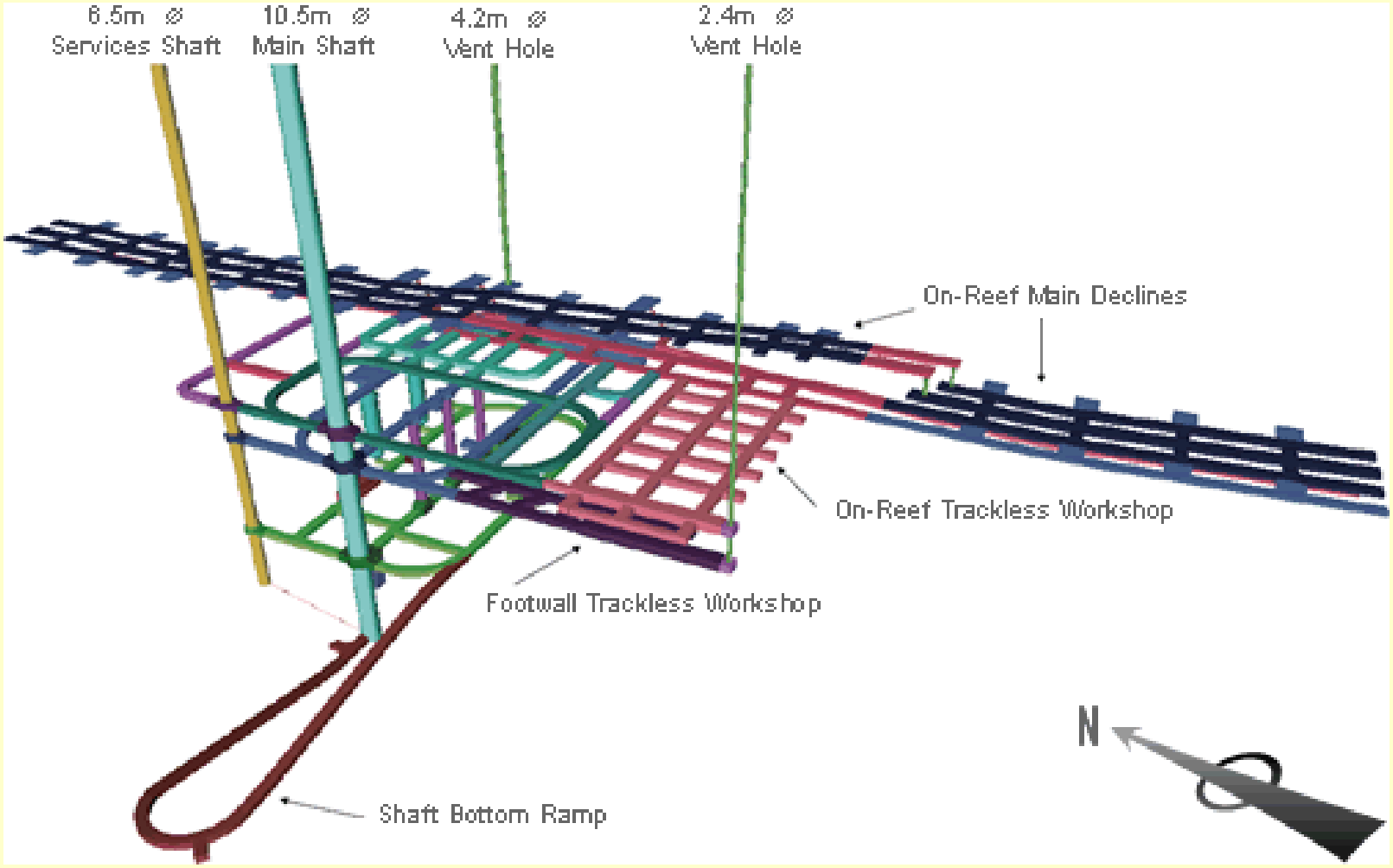


srk consulting	**BRPM North Shaft, Ventilation Shaft** Regional Context	Project No. 420937

Figure 7-1: Regional context of the Proposed BRPM North Shaft's North Shaft Phase 3 Ventilation Shaft.

srk consulting	**BRPM North Shaft, Phase 3 Ventilation Shaft BRPM** Satellite image	Project No. 420937

Figure 7-2: Satellite image of BRPM (Google Earth, 2012)



srk consulting	**BRPM North Shaft Phase 3, Ventilation Shaft** Typical isometric view of an underground mining operation	Project No. 420937

Figure 7-3: Typical isometric view of an underground mining operation

7.1 Proposed Project

Ventilation shafts are placed at specified locations along the underground workings to optimise ventilation capacity as required by the Mines Health and Safety Act Regulations, whilst considering energy demands and disturbance that may accrue to attempt to ventilate over prolonged distances. Thus, considering the current mining infrastructure, the location alternatives for the North Shaft Phase 3 Ventilation Shaft are limited.

The proposed North Shaft Phase 3 Ventilation Shaft is located on portion 1 of the farm Boschkoppie 104 JQ. There are three alternative site locations for the proposed North Shaft Phase 3 Ventilation Shaft, all located on the eastern edge of the Robega Village, on opposite sides, outside the flood-lines of the Matlopyane stream (Figure 7-4). The shaft positions are between 20 and 100 m from existing Robega resident's houses.

A photo of an existing typical completed Ventilation Shaft is illustrated in Figure 7-5.

The Proposed North Shaft Phase 3 Ventilation Shaft project includes the following:

- A downcast raise-boring Ventilation Shaft that will be drilled to a depth of approximately 460 m. The shaft diameter will be 4.1 m, which will supply fresh air underground for the Phase 3 workings;
- The associated civil and structural installations on surface. The completed North Shaft Phase 3 Ventilation Shaft footprint area will be approximately 7 x 7 m (49 m²) including the concrete platform surrounding it. The shaft's outlet will be roughly 2.5 m high and have a diameter of 4.1 m;
- Installation of additional equipment such as underground ventilation fans; and
- A 4 m wide gravel service road of approximately 120 m, providing access to the North Shaft Phase 3 Ventilation Shaft. Servitude will be required for the service road. (The road will be made suitable for all types of weather through the removal of the top clay layer).

During the construction period, the construction area will be fenced off with a 70 x 50 m (3 500 m²) security fence. The construction site will include the proposed North Shaft Phase 3 Ventilation Shaft, including the access area, surface parking facilities for employees, site offices, change house, temporary settler ponds, operator's cabin, main substation, power pack store and the drill pipe stacking area. Consideration was given to install the fan drive mechanisms underground to further alleviate noise levels. This will provide added environmental advantage of reducing the visual impact and nuisance to the neighbouring communities. A water recycling dam will be constructed for the temporary storage and recycling of water used during construction processes. An appropriate dust suppression system will be implemented in order to minimize the generation of dust originating from the raise boring machine and construction activities.

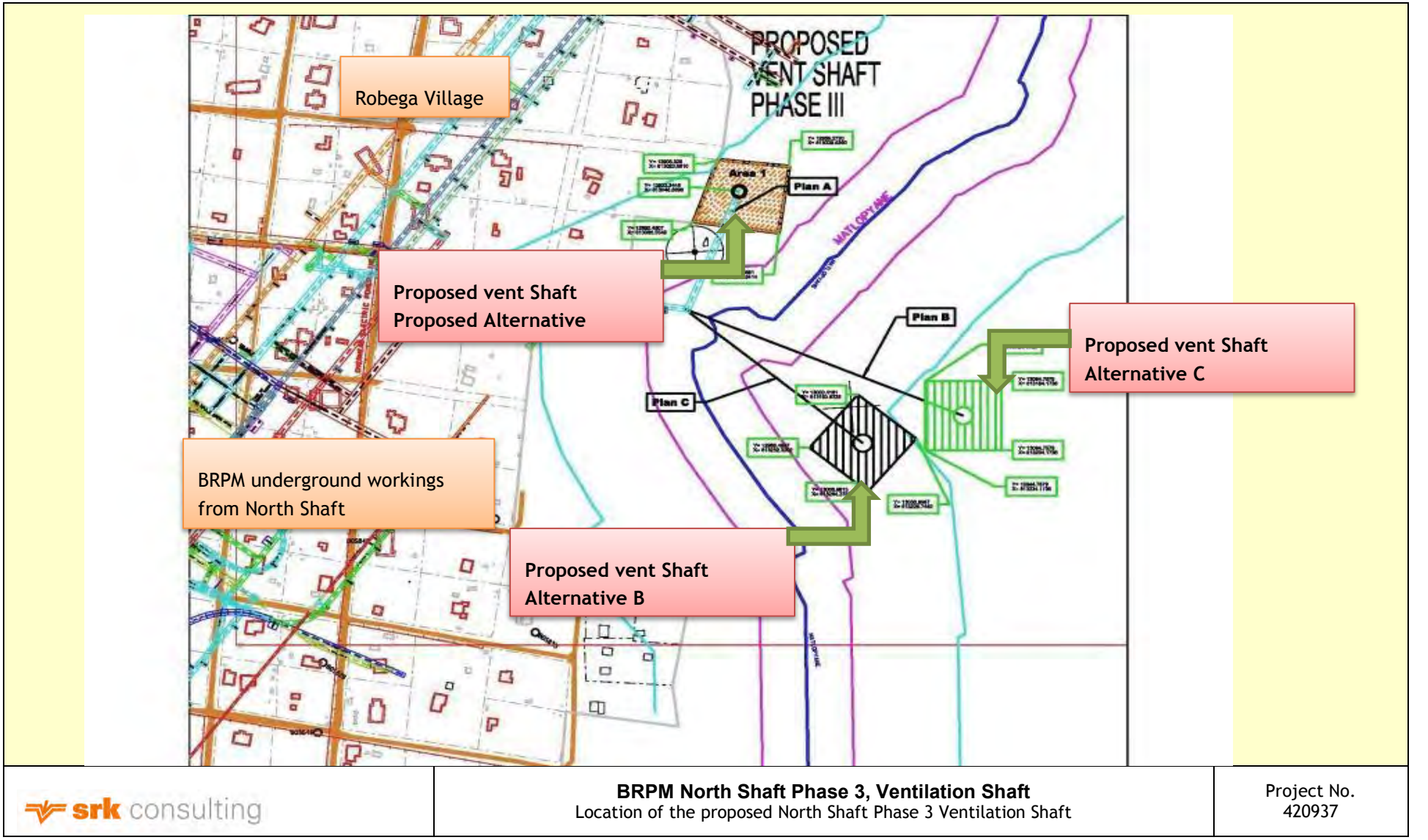


Figure 7-4: Layout of the proposed North Shaft Phase 3 Ventilation Shaft alternatives

srk consulting	**BRPM North Shaft Phase 3, Ventilation Shaft** Typical Ventilation Shaft	Project No. 420937

Figure 7-5: Typical Ventilation Shaft after construction

7.1.1 North Shaft Phase 3 Ventilation Shaft

A raise-boring machine will be used for drilling. This type of machine is used to enable the excavation of a circular hole without the use of explosives. Taking the size of the machine and the force exercised from the machine into consideration, a suitable stable foundation will be required for effective and safe drilling.

Geotechnical Drilling and Service Hole

A 150 mm geotechnical hole will be drilled before any work commences. The information obtained will be utilised in determining the pre-cementation requirements. This hole will also be used as a service hole to potentially provide electrical power from underground to surface.

Pre-cementation

Pending the outcome of the above drilling, typical pre-cementation is as follows: The foundation is first constructed on pillions of concrete that will be installed around the shaft position. Thirty six piles of 750 mm diameter will be drilled and installed around the shaft. This will be filled with concrete to secure the foundation. A 750 mm hole will then be drilled. Steel reinforcing will be lowered into the hole and filled with concrete.

This process is used to seal off the area around the North Shaft Phase 3 Ventilation Shaft position to prevent the ingress of groundwater from the surrounding area into the Shaft. This ensures that the North Shaft Phase 3 Ventilation Shaft should not have any significant impact on the boreholes and groundwater use in the area through the prevention of accumulation of

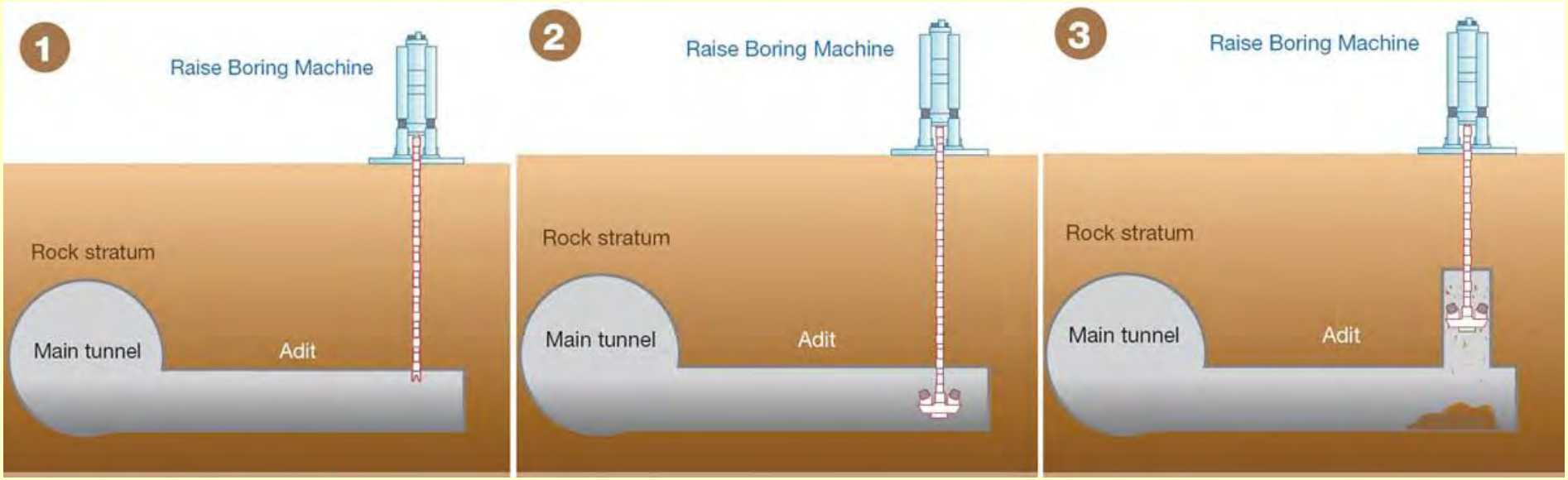
groundwater into the underground workings. Through this the flooding risk of the underground mining operations will also be minimized.

The dust from the machine depends on the soil formation of the top 30 m. BRPM does not foresee excessive dust due to the specific soil type at the sites. Dust suppression methods will be introduced to reduce the dust emissions as much as possible.

Raise-Boring

Figure 7-6 contains an illustration of the raise-boring method.

At first a 381 mm pilot hole will be drilled from surface to the North Shaft Phase 3 Ventilation Shaft position underground. The reamer head will then be attached to the drill steel at the bottom of the North Shaft Phase 3 Ventilation Shaft underground. The raise-bore machine slowly turns and pulls the reamer to surface. The drill chips (rock) will fall to the bottom of the shaft from where the underground machines will remove it. The broken rock therefore falls to the bottom of the hole and the technique allows for greater flexibility in handling the spoil.



srk consulting	**BRPM North Shaft Phase 3, Ventilation Shaft** Illustration of the Raise Boring Method	Project No. 420937

Figure 7-6: Illustration of the raise-boring method

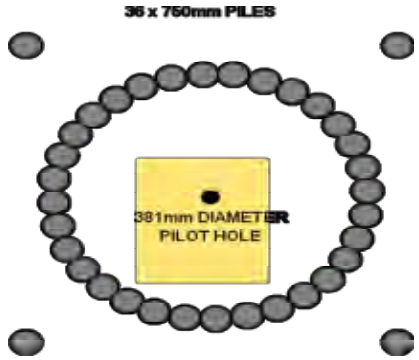
			
The 750 mm piles that will be drilled and installed around the shaft.	Pre cementation drill rig with a dedicate compressor.	The first piling hole of 750 mm.	The boxing of foundation for the raisebore machine.
			
The final concrete foundation for raisebore machine.	The Raisebore rig with the water re-cycling dam	The Raisebore rig.	The Raisebore machine in operation.
srk consulting	**BRPM North Shaft Phase 3, Ventilation Shaft** Photographic illustration of the Sinking Operation		Project No. 420937

Figure 7-7: Photographic illustration of the Sinking Operation

Gravel Service / Access Road.

Considering the location of the proposed North Shaft Phase 3 Ventilation Shaft, a 120 m long and 4 m wide gravel service road will be constructed to provide access during the construction period. This road will be utilized during operation of the North Shaft Phase 3 Ventilation Shaft for maintenance purposes. The newly constructed service road will connect with existing gravel and paved roads, which will all be used during the construction and operation phase of the proposed North Shaft Phase 3 Ventilation Shaft project. Access is planned to be along the D 1813 Road, from the Robega Village.

8 Project Alternatives

In terms of Section 49(d) of the regulations printed in terms of the MPRDA, land use or development alternatives to the proposed operation, alternative means of carrying out the proposed operation and the consequence of not proceeding with the proposed operation must be identified and described. This Scoping Report provides a description on these alternatives to the proposed activity, including the advantageous and disadvantageous that the activity or alternative may have on the environment as well as how the community may be affected by the activity.

8.1 Location Alternatives

Figure 8-1 illustrates the underground geology of the farm Boschkoppie 104 JQ.

Figure 8-1: Boschkoppie geology

8.1.1 Proposed Alternative / Alternative A:

Considering the limited location alternatives due to the current mining infrastructure and existing underground operations, the Proposed Alternative is located between the eastern edge of the Robega Village residential area and western banks of the Matlopyane steam. The alternative is located outside of the 1:100 year flood line, and more than 35 m from the edge of the Matlopyane stream, which is still behind the development setback line. Alternative A is located approximately 80 m from the nearest house.

Access to site Alternative A will be along the existing D 1813 Road, from the Robega Village.

8.1.2 Location Alternatives B

Further away from the Robega Village, alternative B is also located on the eastern banks of the Matlopyane stream, outside the 1:100 year flood line. This alternative is located more than 35 m from the edge of the Matlopyane stream, which is still behind the obligatory development setback line. Alternative B is approximately 135 m from the nearest house. Access to this alternative may pose a challenge considering the position on the other side of the Matlopyane stream. A river crossing may be required for construction machinery including the Raise Bore machine to gain access. This will in turn require an amendment to the BRPM existing Water Use License. No formal road network or easy access is available from the east.

8.1.3 Location Alternatives C

Alternative C is positioned more to the east, away from the Robega residential area, roughly 155 m from the nearest resident's house and on the eastern side of the Matlopyane stream. The alternative is located outside of the 1:100 year flood line, and more than 35 m from the edge of the Matlopyane stream. A river crossing may be required for machinery and the raise boring machine to gain access. This will in turn require an amendment to the BRPM existing Water Use License. No formal road network or easy access is available from the east.

The proposed alternatives are illustrated in Figure 7-4.

8.1.4 Alternatives to the type of type of activity, design, layout and technology

If underground access is already available to the position of the bottom of the proposed shaft, the method known as raise-boring may be employed. The process is discussed in Section 7.1. Many Platinum Mines have successfully used this technique during the development of their underground programs. The raise-boring method has many advantages to the mine including, lowers cost, saves time; and reduction in safety hazards associated with the older methods. This method engages a number of mitigation methods, leaning towards a more environmentally sustainable development. These may include the following:

- During the pre-cementation phase the North Shaft Phase 3 Ventilation Shaft is sealed off to prevent the entrance of groundwater from the surrounding area into the shaft. This minimizes the risk of the shaft impacting on boreholes in the area;
- The operations of the raise-bore machine makes use of suitable water management activities reducing the dust emission during construction;
- A temporary water recycling dam is constructed within the North Shaft Phase 3 Ventilation Shaft footprint. The dam functions to store and reuses water during construction, ultimately opening up opportunities for water conservation measures; and
- No waste rock will be brought to surface, thus minimizing the surface disturbance and waste management impacts.

Due to the advantages associated with using the raise boring method, no alternatives to the activity, design, technology and operational aspects have been assessed.

8.2 Motivation for the proposed project

8.2.1 No-go alternative

The mining industry is a very important economic sector in South Africa, accounting for approximately one third of the country's Gross Domestic Product.

Mining is one of the key sectors of the North West Province, which produces 70 % of the world's platinum from the mines in the Rustenburg region. In 1994 there were 87 mines in North West out of a total of 843 in South Africa (NWPG. 2011).

The proposed North Shaft Phase 3 Ventilation Shaft is absolutely vital as it ensures a safe working environment for the underground mine workers. If the proposed North Shaft Phase 3 Ventilation Shaft does not proceed, it could mean that the ventilation available to the underground miners is not adequate to comply with the Mines Health and Safety Act Regulations. As a result, the Phase 3 development cannot proceed which will ultimately lead to job losses and a contribution to the Gross Domestic Product of South Africa.

8.2.2 Need and desirability

The construction of North Shaft Phase 3 Ventilation Shaft has become a priority. Without the North Shaft Phase 3 Ventilation Shaft project, BRPM will not be able to continue current production rates and social demands, resulting in unemployment of a large sum of residents in the Rustenburg area and surrounding communities. Employment at BRPM will be prolonged in parallel to the prolongation of BRPM Phase 3 expansion.

9 Baseline Environment

In this section of the report, a summary of the baseline environment of the areas on which the proposed project is to be location is described. This has been compiled on the basis of the following:

- Available information from the existing EMPR for the BRPM on the farm Boschkoppie 104 JQ, 1998;
- Previous studies undertaken in the area;
- Existing information on the environmental parameters of the area; and
- Various approved EMP and supporting environmental reports.

9.1 Regional Setting

The proposed project will be situated to the east of the Robega rural traditional community and approximately 38 and 8 km from the towns of Rustenburg and Boshoek in the North West Province respectively.

The current land use of the proposed project is dominantly relating to residential activities. The surrounding land uses include the Robega Community immediately to the west of the proposed North Shaft Phase 3 Ventilation Shaft:

BRPM is surrounded by several other mining operations, communities, railways and roads. The village of Robega is located in close proximity to the proposed project. The surrounding villages lease the land from the Royal Bafokeng Nation. None of the communities in close proximity of the North Shaft Phase 3 Ventilation Shaft are land owners. The villages of Robega is situated on the mine surface lease area and utilize the open areas mainly as grazing land for local subsistence livestock farmers. Chaneng, Boshoek and Mafenya are situated in the surrounding areas. The adjacent land owners are those who share a common border with BRPM, Anglo American Platinum and Rustenburg Platinum Mine on the eastern and western boundary.

The proposed project will be located the farm Boschkoppie 104 JQ. The farm name, surface owner and proposed use are stipulated in Table 9-1.

Table 9-1: Affected farms

Farm name and Portion	Surface owner	Proposed use
Portion 1 of the farm Boschkoppie 102 JQ	Royal Bafokeng Nation	North Shaft Phase 3 Ventilation Shaft footprint

9.1.1 Magisterial District

In terms of the administrative boundaries, the proposed project is located within the North West province. The project is located within the Bojanala District Municipality, Ward 2 of the Rustenburg Local Municipality and Magisterial District. Access to the proposed site is through the regional road R556 or R565. The regional location of the proposed project is shown in Figure 7-1.

The owners of the mining authorisation are Rustenburg Platinum Mines Limited and Anglo American Platinum Corporation. The surface rights of land are owned by the Royal Bafokeng Nation (RBN).

9.1.2 Nearest Town

The towns of Rasimone and Robega are situated on the mine surface lease area. Chaneng is situated partly on the lease area to the north (Figure 9-1). The village of Robega is situated in close proximity to the proposed North Shaft Phase 3 Ventilation Shaft.

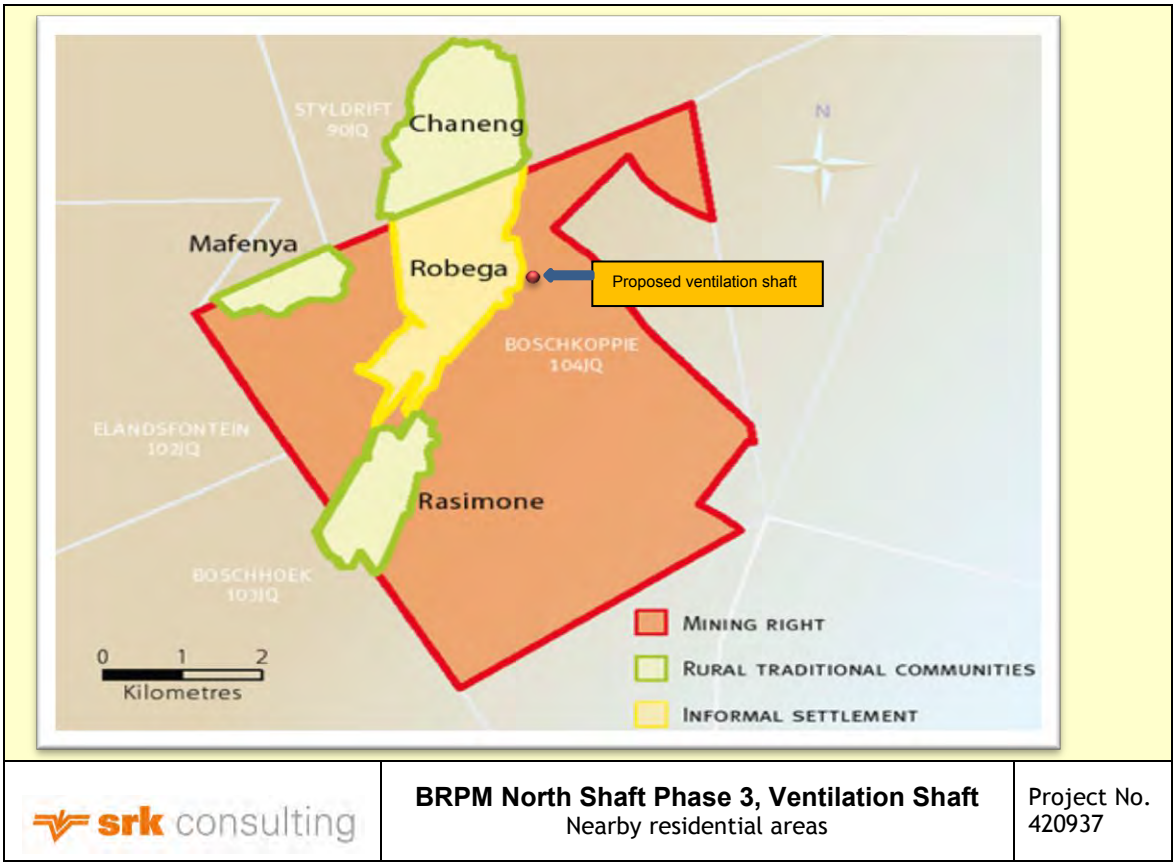


Figure 9-1: Nearby residential areas

The nearby towns cities and residential areas to the Mining right area is given in Table 9-2 (line of sight distances).

Table 9-2: Nearest towns to the proposed development

Town	Distance (km)
Rustenburg Central	25 km (South)
Boshoek	1.5 km (South west)
Rasimone Central	4.5 km
Robega	<0.1 km
Chaneng	2.5 km

9.2 Geology and Topography

BRPM is underlain by the mafic rocks of the Lower, Critical and Main Zones within the Western Limb of the Rustenburg Layered Suite (RLS), Bushveld Igneous Complex, with a small portion of the Pilanesberg Complex to the north of BRPM (Cawthorn et al., 2006; RBP, 2010). The RLS can be divided into five distinguishable portions, namely the western, far western, eastern, south eastern (Bethal) and northern (Potgietersrus) limbs (Cawthorn et al., 2006).

In terms of the underlying structure, the BRPM lease area is dissected by two major normal faults which strike northwest to southeast, and east-north-east to west-south-west; the Boundary and Caldera faults are identified to have the largest down-throws of approximately 100 m and 1,000 m, respectively, in the area (RBP, 2010).

In addition, the Chaneng Graben and Pilanesberg dyke system have been recognised within the mine lease area (RBP, 2010). The Chaneng Graben, or Chaneng Corridor, strikes east-north-east to west-south-west, while the Pilanesberg dyke system strikes north-north-west to south-south-east (RBP, 2010).

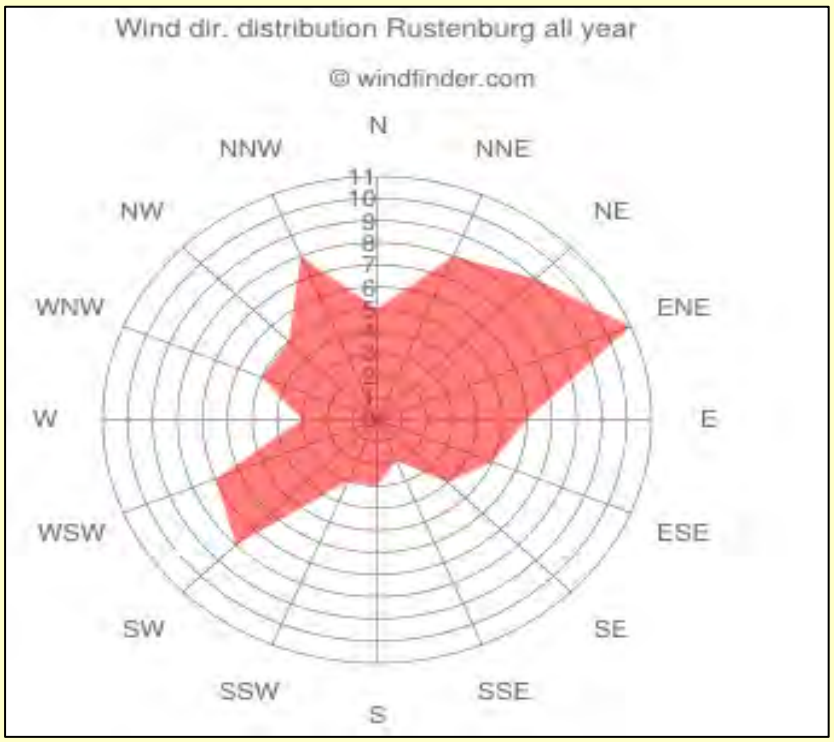
Due the small scale of the project, is not expected that the proposed project will additionally impact the underlying geology.

The general topography of the proposed project area is situated on a flat undulating plain, sloping to the east from the Robega village with an altitude of 1060 meters above seas level (masl). Surface runoff for the proposed project will ultimately flow into the Matlopyane stream, which in turn flows into the Elands River to the north of the site. The proposed project is located in close proximity to existing residential areas. Considering the size of the proposed development it is not expected that the proposed project will not drastically affect the drainage in and around the proposed project or on the topography. The protrusion of the North Shaft Phase 3 Ventilation Shaft above surface will however remain permanent.

9.3 Climate

The proposed project is situated in a semi-tropical region with reasonable high summer and winter daytime temperatures. Average summer temperatures range from 13-30 °C and approximately 2 -24 °C in winter. It is warm to hot with moist summers and cool dry winters (Heymann, E.F., 1997).

The rainy season typically occurs in the summer months (October to March) with afternoon thundershowers which occur most often from August to March. The mean annual rainfall for the area is 513 mm approximately 84 %of which occurs in the summer months (Heymann, E.F., 1997). North easterly and south westerly wind directions prevail throughout the year as stipulated in Figure 9-2.



srk consulting | **BRPM North Shaft Phase 3, Ventilation Shaft** Wind Rose of the Rustenburg area | Project No. 420937

Figure 9-2: Wind rose indicating the dominant wind direction distribution for the Rustenburg area during the year (Windfinder, 2012)

Table 9-3 and Table 9-4 describe the mean monthly rainfall and temperatures of the Rustenburg area (WorldWeatherOnLine, 2012).

Table 9-3: Mean monthly and annual rainfall data for the Rustenburg area

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average (mm)	94	64	61	42	7	3	13	7	10	51	84	73
Rainfall days	15	11	10	8	3	2	1	1	3	9	13	13

Table 9-4: Mean monthly and annual temperatures for the Rustenburg area

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average high temp (°C)	31	31	29	27	25	22	22	25	29	31	31	31
Average low temp (°C)	17	17	16	12	7	4	3	6	10	14	16	17

9.4 Land Capability and land use

9.4.1 Land Use

Land use in the region is predominantly mining and associated industry overlying the Bushveld Igneous Complex (NWPG, 2002). Agricultural land use occurs to much lesser extent near BRPM; however, these areas are located on the fertile soils of the lower lying areas where there is easy access to irrigation schemes (NWPG, 2002; 2003). Considering the size of the proposed

development and the minimal impact resulting from operation, the North Shaft Phase 3 Ventilation Shaft is not anticipated to impact on the land use in and around the proposed development. Land use within the proposed project footprint is utilized for residential areas and community livestock grazing. These areas will be minimally impacted on in relation to the surrounding areas.

The area in the south-eastern part of the farm Boschkoppie 104 JQ is mostly used for cultivation; however a large quantity of the area is not currently utilized for cultivation purposes. The rest of the farm is mostly used for grazing or is uncultivated. Pre-mining land use consisted of the Royal Bafokeng Nation that uses the land for housing and farming purposes. It can thus be said, that no land claim is involved within the proposed footprint of the North Shaft Phase 3 Ventilation Shaft.

The villages of Rasimone and Robega and part of Chaneng are located on the mine lease area. These villages occupy 9 % of the Boschkoppie surface area. The Royal Bafokeng Nation is planning future residential areas. Crop farming consists of mainly sunflower crops that are practised by farmers in the area. The yield is about 2 tonnes per ha. Less than 34 % of Boschkoppie is currently used for crop farming. The carrying capacity of the veld is high but because of the erratic rainfall and droughts the full potential is seldom realised. For grazing purposes about 10 Ha per large animal unit is required. Historical agricultural production is mainly sunflowers and mealies that are produced (Evans, R., & Mnisi, N. 2006).

9.4.2 Land Capability

The mining lease area of BRPM is 3163 Ha in extent. Currently 276 Ha are used for residential purposes. A further 195 Ha have been earmarked for future residential development. The remaining extent of 2693 Ha is available for mining infrastructure. Of this only 641 Ha (at the most) will be utilised for mining infrastructure. In other words mining will utilise 20 % of the entire Boschkoppie or if residential areas are excluded up to 24 % of the available land that may be utilised for mining purposes. Soils of the Boschkoppie farm consist of Arcadia soils and have good arable and grazing potential. However this potential is not realised due to the erratic rainfall. There are no natural wetlands or natural wilderness areas on the mining lease area (Evans, R., & Mnisi, N. 2006). The proposed construction on the Boschkoppie farm relates to the construction of a raise-boring North Shaft Phase 3 Ventilation Shaft covering approximately 49 m^2.

9.5 Ecology

The Bafokeng Rasimone Platinum Mine presently controls some natural areas with high biodiversity conservation value. Based on the 2003/2004 biodiversity assessment as well as the 2009 update assessment, eight distinct Biodiversity Management Units (BMU's) were identified and delineated within the study area. These BMU's were named as follows:

- BMU1: Low closed woodland;
- BMU2: Short open woodland;
- BMU3: Low sparse woodland;
- BMU4: Secondary low sparse woodland;
- BMU5: Low thicket;
- BMU6: Seasonal marsh;
- BMU7: Cultivated areas; and
- BMU8: Mine infrastructure and urban areas.

9.5.1 Flora

The study area falls within the Clay Thorn Bushveld vegetation type, which in turn comprises part of the Savanna Biome. The vegetation type covers a surface area of approximately 16 302 km^2 within South Africa, approximately 60% of which has been transformed and only 0.93% of which is currently conserved. Mixed Bushveld occurs to the north of the study area adjacent to and including Pilanesberg National Park. In accordance with the latest vegetation map for South Africa, Lesotho and Swaziland, almost the entire study area falls within the area mapped as Zeerust Thornveld. The smaller portion of the study area, situated adjacent to the Sun City tar road, falls partly within the boundary of the area mapped as Gold Reef Mountain Bushveld (BRPM, 2009).

Six broad-scale vegetation units representing untransformed vegetation/habitat were identified within the BRPM study area, each with its own average species richness. In addition, there are also currently transformed vegetation/habitat areas, namely cultivated agricultural lands and mine infrastructure/urbanized areas (BRPM, 2009).

A total of 420 infra specific taxa were recorded within the Rasimone study area during the baseline survey in 2009. Of these 420 plant taxa, 346 are indigenous taxa and 74 (17.6 %) are aliens. Of the 74 alien species, 37 are Declared Weeds, Declared Invaders or proposed Declared Weeds or Declared Invaders, as stipulated by the 'Conservation of Agricultural Resources Act' (Act 43 of the Republic of South Africa 1983). No significantly impacting alien vegetation was recorded at the proposed site of the North Shaft Phase 3 Ventilation Shaft (BRPM, 2009).

Human actions have shaped the character of the vegetation in the study area significantly, although natural patterns are still evident in some undisturbed areas. Large parts of the study area have been cultivated in the past and current mining activities have completely destroyed areas of vegetation. Heavy grazing, trampling, altered fire regimes and harvesting of natural products, e.g. firewood, impacts upon the remaining vegetation (BRPM, 2009).

In conclusion, no threatened plants species have been recorded during the flora survey, and it is considered unlikely that any threatened species occur within the study area.

9.5.2 Fauna

Based on the latest fauna distribution data and habitat availability within the study area it is estimated that the following composition of fauna may be expected on the mining lease area:

- 17 frog species;
- 57 reptile species;
- 294 bird species; and
- 90 mammal species,

Thus a combined total of 458 animal species may occur in the study area. The expected species composition varies between BMU's depending on the representation of their required habitats. The Seasonal Marsh biotope (BMU6) attracts the most diverse assemblage of animal species (312 species; 68% of fauna in the area). The woodlands (BMU1 to 4) are also diverse, with between 50% and 60% of the expected species present. Due to the homogenous and unnatural state of the Mining and urban biotope (BMU8), and the Cultivation biotope (BMU7), fewer specialized fauna are attracted to the transformed area (93 and 44 species respectively). Table 9-5 illustrates the specie richness of the BRPM mining lease area.

Table 9-5: Faunal groups per habitat identified in the mining lease area

Status	BMU1	BMU2	BMU3	BMU4	BMU5	BMU6	BMU7	BMU8
Frogs	0	2	3	3	0	17	0	2
Reptiles	38	48	40	32	30	36	1	6
Birds	86	156	151	161	162	186	42	72
Mammals	47	57	63	49	43	73	1	13
Totals	171	263	257	245	235	312	44	93
% of total	37%	59%	55%	53%	50%	68%	9%	19%
Threatened spp	7	11	11	10	10	13	1	2

9.6 Surface Water

BRPM receives potable water from the Magalies Water Service Provider. A number of measures have been implemented at BRPM to prevent pollution from entering the environment, as stipulated in the existing Water Use License.

The non-perennial streams of Bonwakgogo, Matlopyane and Majapele originate on Boschkoppie. The Matlopyane originates some 5 km south of the farm Boschkoppie. These streams drain northwards into the Elands River which in turn drains into the Crocodile River. The farm, Boschkoppie 104 JQ is thus located in the greater Crocodile River catchment (Evans, R., & Mnisi, N. 2006. These rivers mainly flow after heavy rain events, therefore no permanent surface water sources, such as wetlands, occur. Resulting from this, there are no permanent surface water users (Heymann, 1997).

The affected stream courses are those streams originating on the farm as well as those draining from upstream through the farm. The receiving water bodies are the streams directly downstream of Boschkoppie in other words the Elands River.

The drainage density is the kilometres of drainage path on Boschkoppie divided by the square kilometres of the land area. In terms of the entire Boschkoppie this is about 0.21 km/km².

The proposed development is on the northern section of portion 1 of the farm Boschkoppie 104 JQ, somewhat 4 km from the origination of the Bonwakgogo non – perennial stream.

BRPM currently undertakes surface water monitoring as per the existing BRPM Water Use License (WUL). Four monitoring points are located within the Elands River. BRPM will continue to monitor the surface water flow and qualities as per existing WUL. It is envisaged that the proposed project will not detrimentally impact the surface water resources in the area.

9.7 Geohydrology

The ground water level is shallow and varies between 10 and 20 m below natural ground level. The depth to ground water level is determined primarily by the type of aquifer and the hydraulic characteristics of the water-bearing formations and is expected to reflect piezometric levels in shallow and deep seated weathered and fractured hard bedrock aquifers comprising weathered and fractured, layered pyroxenite, norite-anorthosite and gabbro-norite rocks (Evans, R., & Mnisi, N. 2006).

Ground water levels appear to resemble the local topography i.e. regional ground water drainage takes place in a predominant north-easterly direction although locally, drainage may take place towards the surface drainage features. At least three different intrusions by dykes of dolerite sub-compartmentalise the farm but they appear not to influence ground water levels i.e. the depth to ground water level seems to be almost the same from south to north. However, it should be noted that no boreholes are located in close proximity to these structures (Evans, R., & Mnisi, N. 2006).

There are at least:

- 13 borehole water sources on the farms south-west and north of the mining area;
- 16 borehole water sources in the village Rasimone
- 40 borehole water sources in the village Robega; and
- 40 borehole water sources in the village Chaneng.

Many of these boreholes have been drilled by the defunct Department of Water Affairs of Bophuthatswana. There are no indications at the surface of shallow ground water discharges through seeps and sprigs (Evans, R., & Mnisi, N. 2006).

BRPM currently have 48 groundwater monitoring points, of which 31 are currently still being monitoring and do not have constricted access. Any contaminated or reduced groundwater quality is actively identified through the continual groundwater monitoring network, although the proposed project is not expected to contribute to the reduction in groundwater quality. .

9.8 Air Quality

A survey of the pre-mining air quality was taken and spot samples for various gases (normally associated with mining and beneficiation activities) were taken at seven pre-determined positions. Longer term dust samples were also taken at the same positions. The results of the dust sampling were calculated as 8 hr time weighted averages (TWA's) (Evans, R., & Mnisi, N. 2006).

The results indicate that on the day of the survey, no gases (except for carbon dioxide) were detected. Carbon dioxide occurrences were within natural limits. The dust TWA's when calculated from 8 hr equivalent volumes to hourly averages over 24 hrs indicate that dust levels on the day of the survey were below accepted guidelines. It can be concluded from this survey, that on the day of the survey gases and dust were either absent or within set guidelines. The wind direction was generally westerly in the early morning of the survey, turning east later on during the morning (Evans, R., & Mnisi, N. 2006).

During south or south eastern wind conditions these results may change due to the mining and beneficiation operations of mines to the south and south east of Boschkoppie. The cumulative effect of smoke from the villages and possible dust formation due to mining operations may adversely affect the air quality (Evans, R., & Mnisi, N. 2006).

Monthly dust monitoring takes place at BRPM at various surface locations including the tailings dam, processing plant, ore transfer points and along the roads. In general, the dust levels at all locations within the BRPM lease area occur within the required limits as stipulated in the National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA). The construction of the proposed development may result in increased dust emissions during the construction phase however, this is not anticipated to be significant and will cease following the construction phase of the project.

Considering low levels of air pollutants within the mining areas and the proximity of the proposed North Shaft Phase 3 Ventilation Shaft to the mining areas, it is expected that the pollutant sources will have subsided at the Robega community (i.e. North Shaft Phase 3 Ventilation Shaft position).

9.9 Noise

A pre-mining base-line ambient noise survey was conducted and this survey indicates that the current noise levels of the areas in the vicinity of the proposed mine are higher than that expected for rural areas. In fact most noise level measurements are above those which are expected in suburban districts. Numerous trains passed through the area during the survey, which obviously increased the noise levels.

As current operation are underway, noise monitoring is conducted at various locations around BRPM. The noise monitoring locations are situated at the following areas:

- North Shaft;
- South Shaft;
- Processing Plant;
- Conveyor belts; and
- Nearby the Village of Rasimone.

BRPM are committed to incorporate noise reduction measures though the area of mining activities. As a result of mining operations and underground blasting, a degree of vibrations can be felt, although not contributing to surface noise pollution.

The proposed development will be located in close proximity to the Robega community. Thus, in context, any noise generated from the construction and / or operation of the proposed project may influence the surrounding communities, although this noise impact should be minimal, BRPM should focus on noise amelioration measures during construction of the North Shaft Phase 3 Ventilation Shaft.

The proposed North Shaft Phase 3 Ventilation Shaft sites are situated on the east of the Robega Village along the vacant land between the village and an existing gravel road east of the village. The proposed construction phase will take between 6 to 8 months after which all construction vehicles and activities will stop and removed from the site (v/d Merwe, B. 2012). The construction activities will take place mostly during the daytime when the prevailing ambient noise levels are higher. The following construction activities will take place such as drilling, excavations, removal of waste material from the site, power generation and the assembling of the duct. There will be an increase in the ambient noise level caused by some of these activities of which some will be for short periods in the far field (500 m from the site) but most will be close to the source (site specific).

9.10 Cultural and Heritage

No archaeological sites of any significance were found. It should be kept in mind that archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place (Coetzee, F.P. 2012). The possible presence of archaeological sites and artefacts are further enhanced by the proximity of the Pilanesberg National Park and other protected areas nearby. The proximity of the Pilanesberg and Magaliesberg Protected areas are illustrated in Figure 9-3.

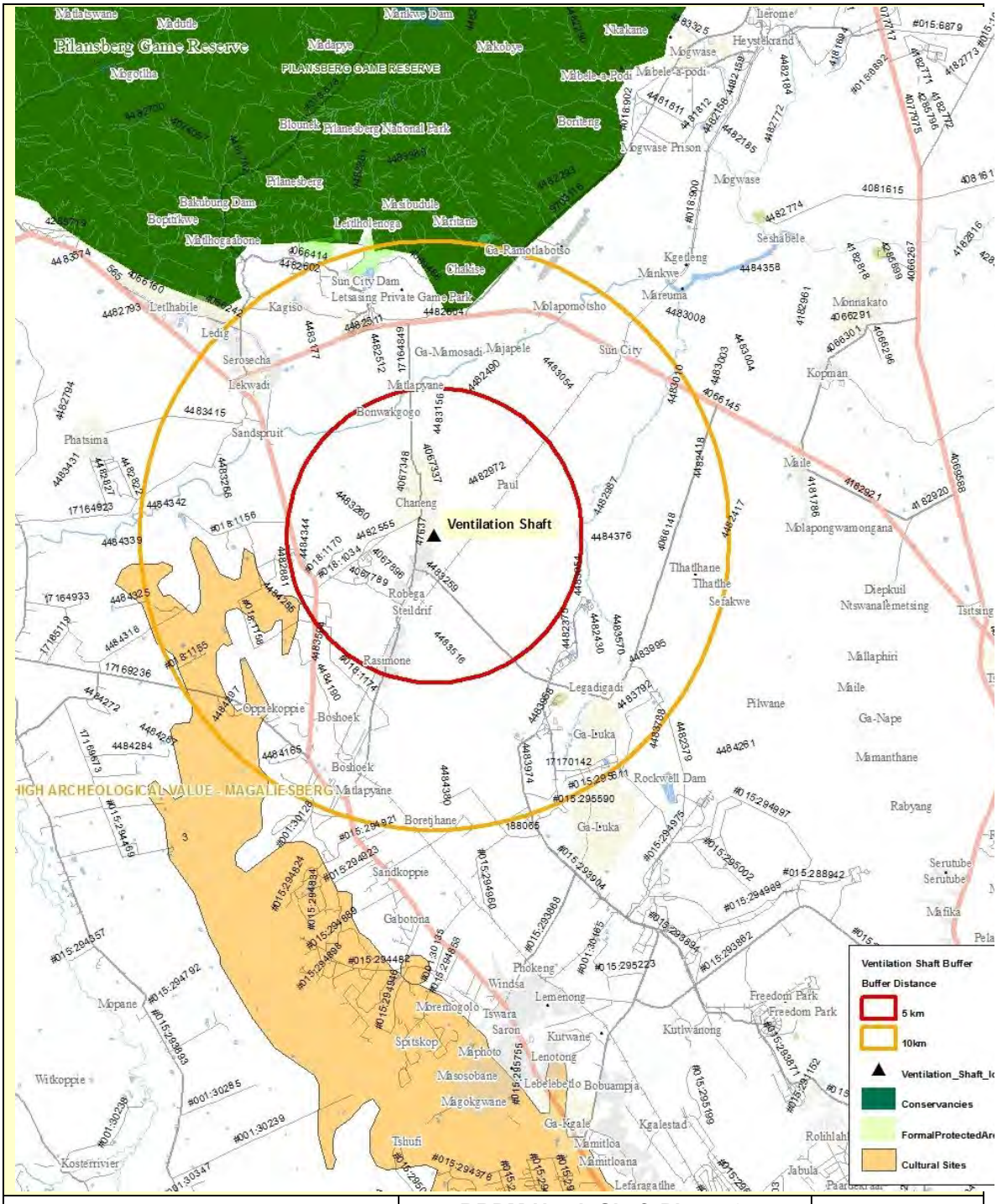


Figure 9-3: Proximity of Proposed North Shaft Phase 3 Ventilation Shaft to Protected areas

9.11 Visual quality

Mine infrastructure will be visible from the Rustenburg-Derdepoort road which leads to Sun City and the Pilanesberg Game Reserve. The villages of Rasimone and Robega are situated on the property, while Chaneng lies on the northern boundary. The proposed North Shaft Phase 3 Ventilation Shaft will be visible to the people living in the villages particularly Robega. Management measures will be put in place in order to minimize the visual impact during construction and operation.

9.12 Soils

Soil type mainly consists of two types, namely, black Arcadia Form (Ar) and red Hutton Form (Hu). Two koppies are situated on the north-western side of Boschkoppie 104 JQ. The soil on these koppies consists of Mispah (Ms). Hutton Form is located mainly on the far-western and north-western side of the property and on adjacent western properties. There is however also a pocket of Hutton Form in and around parts of the village of Rasimone. The Arcadia Form is however the predominant soil on the farm Boschkoppie 104 JQ (Haymann. 1997).

Both of these soil types are fertile and are excellent agricultural land with high potential. This high potential is unfortunately to a large extent neutralised by erratic rainfall and droughts that frequently occur in the area. It is for this reason that ploughing and planting of the soil is viewed to be of high risk. Sunflower is the main crop on the property and it has a potential yield of 2 ton per hectare. Due to the erratic rainfall, this potential is, however, seldom reached. Cattle farming in the area are a better economic option, provided that drinking water is available. For grazing purposes about 10 Ha per large animal unit is required. If the soil is overgrazed or denuded, it is potentially highly erodible (Haymann. 1997).

The property of the proposed North Shaft Phase 3 Ventilation Shaft is however very flat and no signs of extensive erosion were noticed. The soil on the property is used for grazing and arable purposes, as well as for housing. The black turf - Arcadia - consists of a homogenous vertic turf, the depth of which fluctuates between half a meters to two metres. This Arcadia turf has high clay content, up to 35%, with the result that it swells much after rain and again shrinks when it dries out. The clay was derived from predominant montmorillonitic clays. The turf has been deposited on weathered norite, which is common to the Bushveld Igneous Complex (Haymann. 1997).

The red soil - Hutton - consists of an ortica horizon located on an apedal B horizon with a depth of 1.2 m and deeper. This is excellent arable land and due to the high clay content, it has a high agricultural capacity. However, ploughing and crop farming is again viewed as a risky undertaking due to the erratic rainfall (Haymann. 1997).

It is envisaged that the proposed project will have a minimal effect on the erosion ability and destruction of natural soils in the area (Haymann. 1997).

9.13 Vibration

The effects from raise-boring with regards to ground vibration are expected to be well contained within 25 m from the North Shaft Phase 3 Ventilation Shaft. Levels from raise-boring are considered similar to certain construction equipment. The levels yielded from this equipment are well below damaging criteria for structures but could possibly be felt at distances of 15 m and closer. There is no specific ground vibration related reason indicating that this project cannot continue (Zeeman, J.D. 2012).

Vibration monitoring is conducted as part of the Styldrift Mining complex situated to the north west of the proposed North Shaft Phase 3 Ventilation Shaft. Minimal ground vibration and air blast readings have been identified during blasting activities from Styldrift. Those reading that were recorded showed minimal impacts on infrastructure damage to the closed residents. Continual vibration monitoring will be conducted in adherence to the Styldrift EMPR. The proposed ventilation shaft will fall within the ambit of this monitoring. Thus any material deviations to the vibration environment will be monitoring.

9.14 Traffic capacities

Mine personnel currently use the existing road network from the BRPM concentrator plant to Rustenburg to transport PGM concentrate in trucks to Anglo Platinum Ltd.'s Smelters and

refineries. Other traffic volumes in the area relate to the local community daily activities. The current road used by the communities will be utilized for access to the North Shaft Phase 3 Ventilation Shaft. Minimal traffic impacts will result from this, apart from the daily traveling of the construction workers to the proposed site. As a result of the construction phase, traffic may temporarily increase along the roads leading to the North Shaft Phase 3 Ventilation Shaft position, although this will cease after construction.

9.15 Regional Socio - Economic structure

The closest neighbouring communities to the project, namely Chaneng, Rasimone, Mafenya and Robega Villages, constitute Ward 2 of the Rustenburg Local Municipality in the Bojanala Platinum District. The Royal Bafokeng Nation is the dominant ethnic group in the Ward which had a relatively young population (38% less than 20 years of age) of 12 715 people in 2001 (Statistics South Africa, 2001). The employment level amongst the economically active population (aged 15 to 65) is 37% in Chaneng, 38% in Robega and 39% in Rasimone (Statistics South Africa, 2001). Unemployment remains a critical issue in the project and broader Rustenburg area.

10 Anticipated Environmental, Social and Cultural Impacts

The Scoping Report aims to identify the potential positive and negative biophysical, social and cultural impacts of the proposed project. A number of possible impacts have been identified by the project team. The following possible impacts have been considered for the construction and operation of the proposed project. The majority of the impact will result from the construction phase of the proposed development. Mitigation and management of these impacts will be addressed in the EIA/EMP phase of the project. The case may be that additional impacts are identified during the EIA phase that are not included in this table, will be assessed and addressed in the EIA/EMP. Potential biophysical and socio – economic impacts are summarised in Table 10-1.

Table 10-1: Summary of Potential Environmental impacts associated with the proposed development

Element of Environment	Potential Impact Descriptions
Socio-Economic	As a consequence of changes to the Regulations in respect of ventilation of underground working areas, BRPM has been required to establish an additional ventilation shaft to service its existing BRPM underground mine development operations. North Shaft Phase 3 Ventilation shaft is motivated to comply with the mines occupational health and safety requirements, which are required to continue the underground mining operations at BRPM. In the absence of compliance with the mining ventilation regulations, BRPM mine could be required to cease operations, with direct impact on the current and potential future employees at the BRPM Mine. Approximately 6 600 people are currently dependent on BRPM for employment and income, which include sub-contractors, the wider community and service providers.
Topography	During construction there will be boring equipment on site, as these will not a permanent feature the impact on topography during construction is not significant. During operational phase there will be an exhaust canopy on the surface, in relation to the existing surrounding environment, the impact is expected to be insignificant.
Climate	No impact is anticipated on climate as a result of the ventilation shaft during the construction or the operational phase of the project.
Groundwater	The footprint area of the North Shaft Phase 3 Ventilation Shaft development is 49 m^2. The surface concrete works to locate the drilling rig, and subsequently house the canopy of the ventilation shaft will be appropriately engineered and sealed to prevent the ingress of rainwater into the shaft as it is developed and subsequently operated, according to established construction activity management controls applied by BRPM for their existing ventilation shafts. The shaft itself will be will also be appropriately engineered and sealed to prevent the ingress of groundwater into the shaft as it is developed and subsequently operated. Construction activity management will ensure that any materials handling does not pose a material risk to soil, surface water and groundwater pollution.
Surface water	The footprint area of the North Shaft Phase 3 Ventilation Shaft development is 49 m^2. The surface concrete works to locate the drilling rig, and subsequently house the canopy of the ventilation shaft will be engineered and sealed to prevent the ingress of rainwater into the shaft as it is developed and subsequently operated, according to established construction activity management controls applied by BRPM for their existing ventilation shafts. The construction activity area itself will also be appropriately engineered and sealed to provide diversion of run-off from up-gradient areas and minimise and contain dirty stormwater arising during construction activities. Once construction has been completed the construction activity area will be rehabilitated and the operational shaft area reduced in size. The Matlopyane non perennial stream is located approximately 37 m from the shaft construction footprint and 76 m from the Ventilation Shaft. The North Shaft Phase 3 Ventilation Shaft falls outside the ambient of a Water Use License. It is however not envisaged that the proposed activities will impact the stream. Mitigation and Management measures will however be provided during the EIA/EMP phase/. Construction activity management will ensure that any materials handling does not pose a material risk of surface water pollution.
Geology	No impacts anticipated on geology as a result of the establishment of the Ventilation Shaft. Appropriate geological and rock mechanics will be applied to the design of the North Shaft Phase 3 Ventilation Shaft to ensure safe construction and subsequent operation, according to established construction activity management controls applied by BRPM for their existing ventilation shafts.
Air Quality	There is a potential for minor dust generation during the construction phase of the ventilation shaft, which will be managed according to established construction activity dust suppression controls applied by BRPM. Dust emissions are expected to occur during the pre-cementation cycle. This process is planned to take about 8 weeks. Dust and fume emissions associated with vehicle movement with respect to site preparation with respect to site preparation and driving to and from site. The North Shaft Phase 3 Ventilation Shaft should have no material air quality impact during operation.
Noise and Vibration	Construction activity at the project site will result in some localised noise which will be managed according to established construction activity management controls applied by BRPM for their existing ventilation shafts. Construction activities at the site would be short-term and no significant adverse impacts related to noise or vibration during construction is expected.
Visual	The North Shaft Phase 3 Ventilation Shaft is within the operational area of numerous significant mining and processing plant activities. The footprint area of the North Shaft Phase 3 Ventilation Shaft will be 49 m^2 and the height above ground level of the top of the ventilation canopy at approximately 3-5 m. The construction and subsequent

Element of Environment	Potential Impact Descriptions
	operation of North Shaft Phase 3 Ventilation Shaft should have no direct material impact on the visual environment.
Soils/Land Use/Land Capability	The anticipated footprint will only be 70 x 50 m during the construction phase. Loss of soil resource due to land clearing and infrastructure establishment. Soil erosion during the construction phase. The shaft will temporary reduce the land capability on the footprint areas of the shafts. During the construction phase there might be hazardous waste produced as a result of the operation and maintenance of construction vehicles and machinery. Such wastes are likely to include contaminated soils (as a result of oil spills), oily rags and containers. Based on the frequency of generation of such waste and the expected quantities it is therefore anticipated that the associated impacts shall be minimal and of short term.
Biodiversity	Large parts of the project area consist of natural vegetation; however significant proportions are secondary or impacted on by human activities including urbanization. Disturbance of vegetation and flora. The anticipated impact on flora in the footprint areas is minimal due to the small shaft construction footprint area and the low conservation value of secondary black turf thornveld. The North Shaft Phase 3 Ventilation Shaft will have no significant impact on species in the area and impacts are generally rated as low in significance.
Heritage	Disturbance of areas of Archaeological Importance. No cultural heritage resources or graves within the footprint of the North Shaft Phase 3 Ventilation Shaft can be seen at this stage and minimal impacts are therefore expected. During the construction, if any artefacts are uncovered they will be reported to the nearest museum where a heritage practitioner will conduct an assessment and provide mitigation measure. Mitigation and management may be required.

11 Plan of Study for EIA and EMP

Potential biophysical and social impacts have been identified during the Scoping Phase of the project. No fatal flows or significant environmental impacts are anticipated for the proposed construction of the proposed project. Considering the minimal environmental impacts resulting from the proposed North Shaft Phase 3 Ventilation Shaft, the Scoping Phase has efficiently assessment of environmental impacts, aiming to provide the DMR with sufficient coherent information in order for them to make a sound decision regarding the proposed project.

The areas of the proposed project fall within the areas assessed as part of the original BRPM EMPR. The majority of the impacts are thus determined from existing specialist studies conducted for the BRPM and Styldrift Merensky Phase 1 project. These will be used to assess the risks of the proposed project on the environment.

11.1 Purpose of this Plan of Study (POS)

The Scoping Phase of this EIA process has identified minimal potential environmental impacts, and recognized the potential for an alternative site location. The POS is the conclusion to the Scoping Report. This POS outlines the process to be followed during the course of the EIA, and submitted to DMR for approval. The purpose of the POS is to layout an effective methodology to be followed during the assessment of impacts, should this be deemed necessary, in order to meet the requirements of MPRDA.

11.2 Purpose of the EIA and the EMP

The objectives of the EIA / EMP, which have been addressed in the Scoping Report, will be to:

- Identify and assess the environmental (biophysical and social) impacts of the construction, operation, decommissioning and post closure impacts of the proposed project. The cumulative impacts of the proposed development will also be identified and evaluated;
- Alternative activities and locations will be determined and assessed in parallel with the proposed activity;
- Identify and evaluate potential management and mitigation measures that will reduce the negative impacts of the proposed development and enhance the positive impacts;
- Compile monitoring, management, mitigation and training needs in the EMP; and
- Provide the decision making authorities (DMR) with sufficient and accurate information in order to make a sound decision on the proposed development.

11.3 Methodology

This report is the Scoping Report, whereby biophysical and socio – economic impacts have been identified and assessed. A management and mitigation plan will be compiled following the EIA phase of the project. The EMP and mitigation measures will forward the effective management of the proposed impacts resulting from the North Shaft Phase 3 Ventilation Shaft. The public participation conducted thus far is described in Section 6 of this document. The POS for the proposed development should achieve the following:

- Describe the tasks that are undertaken as part of the EIA / EMP process and the process followed in undertaking these tasks;
- Describe the authority consultation process and an indication when consultation will be conducted;
- Provide the assessment methodology used to assess the potential environmental impacts; and
- Provide an overview on the on-going I&AP consultation process.

11.4 Tasks to be performed

The following is an outline of the tasks to be performed during the course of the EIA should a formal impact assessment be required. Consultation with the authorities will be highlighted in this section.

11.4.1 Scoping Report (This Report)

The Scoping Report will be placed in the public locations for comment by registered I&AP. This report will be made available for a 30 day period. I&AP's will be notified of the availability of the Scoping Report through email, fax, SMS and posted letters upon which comments can be made. These comments can be directed to Donne Chetty or Ilke Nel at SRK Consulting. The Scoping Report will also be submitted to the competent authority (DMR).

11.4.2 Environmental Impact Assessment

Upon acceptant of the Scoping Report from the competent authority an Environmental Impact Assessment Report (EIAR) will be compiled. The purpose of the Impact Assessment Phase of this EIA is to systematically assess the impacts of the proposed project on the immediate and surrounding biophysical and socio environment, as effectively done in this Scoping Report. The proposed alternatives will be equally assessed based on environment and economic feasibility. Mitigation measures have been proposed for the easing of environmental impacts of the proposed activity. The EIAR will thus include the following;

- Details of the EAP who compiled the report;
- The expertise of the EAP;
- A detailed description of the proposed activity;
- A description of the property on which the activity is to be undertaken;
- Details of the public participation process conducted during the compilation of the EIAR;
- A description of the need and desirability of the project;
- Description of alternatives of the proposed activity, including the advantages and disadvantages
- Detailed description of the consideration of the proposed activity on the environment. Including those of the alternative sites.
- Summary of the key findings identified in the mentioned specialist studies. This will include an assessment of the associated impacts on the environment as well as their related mitigation measures;
- A detailed description of the methodology followed in assessing the significance of the anticipated impacts for each alternative set out in the EIAR. This assessment will be led by the finding of the specialist reports as well as the professional judgement of the project team;
- A description in the gaps and uncertainties pertaining to the project;
- A comprehensive collection of mitigation measures associated with the identified impacts, and an indication on the impact of these measures on the significance of each impact. This will be accompanied by an EMP. The mitigation measures will be formulated through the recommendations of the specialist studies, public comments and professional judgement of the EIA project team; and
- Recommendations and the way forward should any activity, including alternatives, be authorized by the competent authority.

11.5 Environmental Management Plan

The EMP will be compiled in accordance with the MPRDA. The EMP has provided the management and mitigation measure pertaining to the proposed development relating to the identified environmental impacts. These management and mitigation measures will strive to minimize the negative impacts of the proposed development and enhance the positive impacts.

11.6 Submission of EIA / EMP for review

The EIAR will be made available to the public for comment. Registered I&AP's will be informed on the lodging of the report through email, fax, posted letters and the placement of newspapers adverts. The report will be made available for a 30 day commenting period. All comments and issues raised by I&AP's will be consolidated into the draft report and is attached in Appendix C with the relevant response issued by the EAP. The EIA / EMP and Scoping Report will be made available for 30 day public comment period at the locations stipulated in Table 11-1. The comments from the public review period will be submitted to the DMR following submission of the EIA / EMP. The DMR has a legislated period of 120 days to review the EIA / EMP after submission.

Table 11-1: Public review of reports

PUBLIC PLACE	LOCALITY
Rustenburg Public Library	Rustenburg
Bojanala Platinum District Municipality	Rustenburg
Robega Village Community Office	Robega
Chaneng Village Post Office	Chaneng
BRPM main office reception	BRPM
Royal Bafokeng Administration Offices	Phokeng
SRK Website	Pretoria

11.7 Alternatives

According to Section 49(d) of the MPRDA regulations, feasible alternatives need to be considered and assessed during the scoping and EIA phase of the project. During the screening and scoping phase, based on professional judgement of the EAP and I&AP comments, two location and process alternatives have been considered. Section 8 of this report provides a detailed description of the alternatives to the proposed development. In addition to these alternatives, the "no – go "alternative was assessed (Section 8).

11.8 Authority Consultation

On-going consultation with DMR will be conducted during course of the EIA process. Further specialist consultations with the competent authorities will be conducted should they become necessary. Authority consultation is considered to be an on-going process until the termination of the environmental process.

Other authorities that may be included are the Local and District Municipalities, ward councillors, and others identified during the Scoping Phase of the project.

11.9 Public Consultation

The public consultation programme undertaken during the Scoping Phase of the project will allowed for the comments of I&AP's. These comments will be incorporated into this report, and a comprehensive stakeholder database will be developed. With progression into the project life cycle, this database will be continually updated. These parties will be kept informed of the progress during the planning phase of the project, as well as engagement should the input of the I&AP's be deemed necessary. The Scoping Report will be available for comment upon completion. This review process will include the availability of the report in public places and on the SRK website.

11.10 Appeal

All registered stakeholders will be notified on the acceptance or refusal of the Environmental Authorization. I&AP's will be reminded on the opportunity to appeal the decision made by the DMR. The appeal may be lodged within 12 days after being informed about the Environmental Authorization.

11.11 Specialist Studies

Considering the minimal environmental impacts and the quantity of available information on the project area, no comprehensive specialist studies are envisaged. However a Noise, Vibration and Heritage specialist statement has be provided from the relevant specialists (Appendix D). Specialist studies have already been undertaken as part of the BRPM EMPR that cover the areas in which the proposed project falls.

11.12 Financial provision

The Act requires the mine to make financial provision for rehabilitation or the management of negative environmental impacts, this includes:

- All costs associated with the premature closure;
- Decommissioning and final closure at the end of the life of the mine; and
- Post closure management of residual and latent impacts.

These costs will be determined as part of the feasibility study of the project and reported in the EMP.

11.13 Impact Assessment Methodology

The EIA/EMP will be undertaken according to the SRK Consulting standard criteria for impact assessment which is detailed below. The first stage of impact assessment is the identification of environmental activities, aspects and impacts. This is supported by the identification of receptors and resources, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. The above terms, used in relation to significance, are defined in Table 11-2.

The cut-off points have been defined in relation to characteristics of exploration, but those for Probability, Severity/Intensity and Significance are subjective, based on rule-of-thumb and experience.

The significance of the impact is then assessed by rating each variable numerically according to defined criteria as outlined in Table 11-2. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity, spatial scope and duration of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of 15. The frequency of the activity and the frequency of the impact together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact are then read off a significance rating matrix as shown in Table 11-3 and Table 11-4.

The assessment of significance should be undertaken twice. Initial significance should be based on only natural and existing mitigation measures (including built-in engineering designs). The subsequent assessment should take into account the recommended management measures required to mitigate the impacts.

Table 11-2: Criteria for assessing significance of impacts

SEVERITY OF IMPACT	RATING
Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful	5
SPATIAL SCOPE OF IMPACT	**RATING**
Activity specific	1
Mine specific (within the mine boundary)	2
Local area (within 5 km of the activity boundary)	3
Regional	4
National	5
DURATION OF IMPACT	**RATING**
One day to one month	1
One month to one year	2
One year to ten years	3
Life of operation	4
Post closure / permanent	5
FREQUENCY OF ACTIVITY / DURATION OF ASPECT	**RATING**
Annually or less / low	1
6 monthly / temporary	2
Monthly / infrequent	3
Weekly / life of operation / regularly / likely	4
Daily / permanent / high	5
FREQUENCY OF IMPACT	**RATING**
Almost never / almost impossible	1
Very seldom / highly unlikely	2
Infrequent / unlikely / seldom	3
Often / regularly / likely / possible	4
Daily / highly likely / definitely	5

CONSEQUENCE

LIKELIHOOD

Table 11-3: Significance Rating Matrix

LIKELIHOOD (Frequency of activity + Frequency of impact) \ CONSEQUENCE (Severity + Spatial Scope + Duration)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Table 11-4: Positive/Negative Mitigation Ratings

Colour Code	Significance Rating	Value	Negative Impact Management Recommendation	Positive Impact Management Recommendation
	Very high	126-150	Improve current management	Maintain current management
	High	101-125	Improve current management	Maintain current management
	Medium-high	76-100	Improve current management	Maintain current management
	Low-medium	51-75	Maintain current management	Improve current management
	Low	26-50	Maintain current management	Improve current management
	Very low	1-25	Maintain current management	Improve current management

12 Conclusions and Recommendations

As a consequence of the progression of the mining activities from the upper levels to the lower Merensky levels, as well as changes to the Mines Health and Safety Regulations in respect of ventilation of underground working areas, BRPM is required to establish additional ventilation shaft capacity to service its underground mine operations. The ventilation shaft system for this EMPR Amendment is known as the North Shaft Phase 3 Ventilation Shaft.

The establishment of the North Shaft Phase 3 Ventilation Shaft is specifically motivated to comply with the mines occupational health and safety requirements, which are required to continue the underground mining operations at BRPM.

In the absence of compliance with the mining ventilation regulations, BRPM could be required to cease operations, with direct impact on the current and potential future employees at BRPM. Approximately 6 600 people are currently dependent on BRPM for employment and income, which include sub-contractors, the wider community and service providers.

The footprint area of the proposed North Shaft Phase 3 Ventilation Shaft is very small, nominally <50 m^2. It is not anticipated that the construction and subsequent operation of the North Shaft Phase 3 Ventilation Shaft will have any material detrimental environmental impacts, and that construction and operational activities can be mitigated and managed to provide appropriate environmental protection and pollution control. Similar Ventilation Shafts for the same ventilation purpose have been constructed within the surrounding villages with no detrimental consequences. The same basic principles will be employed with the construction and operation of the North Shaft Phase 3 Ventilation Shaft.

No fatal flaws have been identified during the Scoping Phase of this project; however, in accordance with the MPRDA Regulations, the proposed authorisation process will provide for appropriate consideration of potential positive and negative socio-economic and environmental impacts, and consideration of appropriate mitigation and management measurements required. These impacts will be quantified and the proposed mitigation and management assessed in the EIA/EMP phase of the project to determine whether the severities of the impacts are reduced to an acceptable level.

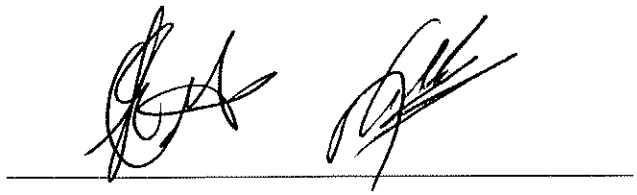
13 Submission of the Scoping Report to the Competent Authorities

The Scoping Report will be submitted to the DMR office, in Klerksdorp for approval. The Scoping Report will also be made available to the following Organs of State, as per Table 13-1.

Table 13-1: Submission of the Scoping Report to the Competent Authorities

Name/Title	Company	Purpose
Mr. Phumudzo Nethwadzi	Department of Mineral Resources Vaal University of Technology Building, c/o Voortrekker & Margaretha Prinsloo Streets, Klerksdorp, 2571 North West Province.	Approval
Mr. Piet Theron	Department of Agriculture, Forestry & Fisheries (DAFF) Directorate: Land Use and Soil Management (LUSM) Louis le Grange Building Peter Mokaba Street Potchefstroom, North West Province. 2520	Comment
Mrs. Motshabi Mohlalisi	North West Department Economic Development, Environment, Conservation and Tourism (NWDEDECT) 80 Church Street, Rustenburg, North West Province.	Comment
Mr. Tendani Nemutandani	Department of Water Affairs – Hartebeespoort Private Bag X352 Hartebeespoort, North West Province.	Comment
Ms. Refiloe Bogosi	Rustenburg Local Municipality P O Box 16 Rustenburg, North West Province. 300	Comment
Mr. Moses Phakwe	Bojanala District Municipality Municipal Manager P O Box 1993 Rustenburg, North West Province. 300	Comment
Ms. Mohono, Desbo Sefanyetso,	Agriculture and Rural Development MEC Private Bag x 2039, Mmabatho 2735	Comment
Mrs. Juanita Fortuin	North West-Regional Chief Director Land Claims Commissioner Private Bag X 08, Mmabatho, 2735	Comment

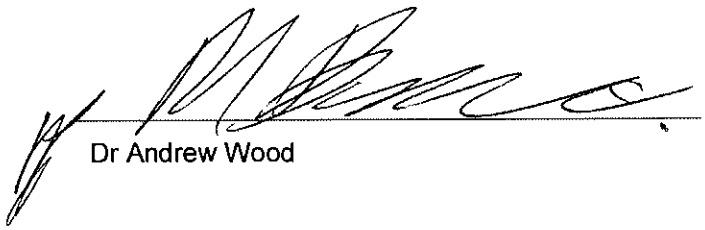
Prepared by



Laetitia Coetser, Andrew Caddick

Project Consultants

Reviewed by



Dr Andrew Wood

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

14 Bibliography

ACOCKS, J.P.H. 1988. Veld types of South Africa (3rd edn.). Memoirs of the Botanical Survey of South Africa No 28. Government printer, Pretoria.

BRYSZEWSKI, W. AND J. VISSER. 2004. Air quality management in the North West Province of South Africa – A successful partnership with industry, INFACON X: Transformation through Technology, ISBN: 0- 9584663-5-1, Cape Town

CAWTHORN, R.G., H.V. EALES, F. WALRAVEN, R. UKEN AND M.K. WATKEYS, 2006, Chapter 11: The Bushveld Complex in Johnson, M.R., C.R. Anhaeusser and R.J. Thomas (eds.), 2006, The Geology of South Africa, GSSA, Council for Geoscience

CPOETZEE, F.P. 2012. Cultural Heritage Survey of the Proposed New Ventilation Shaft Phase 3 Project, Bafokeng Rasimone Platinum Mine, North West Province. Department of Anthropology & Archaeology University of South Africa.

DEAT. 2002. Integrated Environmental Information Management, Information Series 2 :Scoping. DEAT, Pretoria

DEAT. 2002. Integrated Environmental Information Management, Information Series 3 :Stakeholder engagement. DEAT, Pretoria

DEAT. 2002. Integrated Environmental Information Management, Information Series 3 :Stakeholder engagement. DEAT, Pretoria

DEA (2010), Companion to the EIA Regulations 2010, Integrated Environmental Management Guideline Series 5, Department of Environmental Affairs.

DEA (2010), Public Participation, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs.

DRA MINING. (2011). Process Plant Upgrade Feasibility Study: Hazop study briefing note. Royal Bafokeng Platinum.

EVANS, R., & MNISI, N. 2006. Semane Consulting Engineers (Pty) Ltd. Environmental Impact Assessment / Environmental Management Programme Report for the Styldrift Project. Volume 1 and 2. Ref No. 117-GEN-005-0001/11-10-06.

HEYMANN, E.F., 1997, Environmental Management Programme for the proposed new Bafokeng-Rasimone Platinum Mine on the farm Boschkoppie 104JQ required in terms of Section 39 of the Minerals Act, Act 50 of 1991, Amplats

LOW, A.B. & REBELO, A.G. (1998) Vegetation of South Africa, Lesotho and Swaziland. Department of Environmental Affairs and Tourism, Pretoria.

NORTH WEST PROVINCIAL GOVERNMENT (NWPG), 2002, North West Province State of the Environment Report.

NORTH WEST PROVINCIAL GOVERNMENT (NWPG), 2003, Rustenburg Strategic Environmental Assessment.

NORTH WEST PROVINCIAL GOVERNMENT (NWPG), 2011, North West Mining and quarrying report, accessed on 03/07/2012. [Web]: http://www.nwpg.gov.za/transport/nwftd/nw/industries/mining_quarrying/index_xml.html

RUTHERFORD, M.C., MUCINA, L., LÖTTER, M.C., BREDENKAMP, G.J., SMIT, J.H.L., SCOTT-SHAW, C.R., HOARE, D.B., GOODMAN,P.S., BEZUIDENHOUT, H., SCOTT, L. & ELLIS, F. Savanna Biome. In: MUCINA, L. AND RUTHERFORD, M.C. (editors) in press. Vegetation map of

South Africa, Lesotho and Swaziland: an illustrated guide. Strelitzia xx, South African National Biodiversity Institute, Pretoria

ROYAL BAFOKENG PLATINUM (RBP), 2010, RBP Geology, accessed on 03/07/2012. [Web] http://www.bafokengplatinum.co.za/b/geology

SOUTH AFRICA.1998. National Environmental Management Act (Act No. 107, 1998).Pretoria: Governmental Printer.

SOUTH AFRICA.1998. Environmental Conservation Act (Act No.73 of 1989). Pretoria: Governmental Printer.

SOUTH AFRICA 1996. The constitution of the Republic of South Africa (Act no 108 of 1996) Pretoria: Governmental Printer.

SOUTH AFRICA.1998. National Environmental Management: Waste Act (Act No. 59 of 2008).Pretoria: Governmental Printer.

SOUTH AFRICA.1998. South African Heritage Resources Act (Act No. 107, 1998).Pretoria: Governmental Printer.

STATISTICS SOUTH AFRICA. 2011. Key municipal data. Accessed on 03/07/2012. [Web]: http://www.statssa.gov.za/community_new/content.asp?link=interactivedata.asp

VAN DER MERWE, B. 2012. Environmental Authorisation for Royal Bafokeng Management Services (Pty) Ltd Noise Impact Assessment North Shaft Phase 3. dBAcoustics.

VAN DER MEULEN, F. 1979. Plant sociology of the western Transvaal Bushveld, South Africa. A syntaxanomic and synecological study. Dissertationes Botanicae 49: 1–234.

WESTHOFF, V. & VAN DER MAAREL, E. 1978. The Braun-Blanquet approach. In: Whittaker, R.H. (ed.) Classification of plant communities. W. Junk, The Hague.

WINDFINDER, 2011, Wind & weather statistic Rustenburg, accessed on 02/07/2012. [Web]: http://www.windfinder.com/windstats/windstatistic_rustenburg.htm

WIKIPEDIA, 2011, Bushveld Igneous Complex. access on 03/07/2012. [Web]: http://en.wikipedia.org/wiki/Bushveld_Igneous_Complex.

WORLDWEATHERONLINE, 2011, Rustenburg Weather, South Africa Weather Averages, accessed on 02/07/2012. [Web]: http://www.worldweatheronline.com/weather-averages/South-Africa/2610093/Rustenburg/2620149/info.aspx

ZEEMAN, D.J. 2012. Report: Ground Vibration levels from Raise Boring for Royal Bafokeng Platinum Mine North Shaft, Phase III Project Replacement Project. Blast Management and Consulting. Ref. No.: SRK~RBPM Phase 3 Vent~120120.

Appendices

Appendix A: Curriculum Vitae

Appendix B: Project Experience

Appendix C: Issues and Responses Report

Appendix D: Specialist Statements

Appendix E: BRPM SHE Policy

SRK Report Distribution Record

Complete this form and include it as the final page for each copy of the report produced.

Report No. 420937/Scoping Report

Copy No. 18

Name/Title	Company	Copy	Date	Authorised by
Mr.Phumudzo Nethwadzi	Department of Mineral Resources (DMR)	1-3	September 2012	
Mr. Piet Theron	Department of Agriculture, Forestry & Fisheries (DAFF) Directorate: Land Use and Soil Management (LUSM)	4	September 2012	
Mrs. Motshabi Mohlalisi	North West Department Economic Development, Environment, Conservation and Tourism (NWDEDECT)	5	September 2012	
Mr Tendani Nemutandani	Department Water Affairs (DWA)	6	September 2012	
Ms Refiloe Bogosi	Rustenburg Local Municipality	7	September 2012	
Mr. Moses Phakwe	Bojanala District Municipality	8	September 2012	
Ms. Mohono, Desbo Sefanyetso	Agriculture and Rural Development	9	September 2012	
Mrs Juanita Fortuin	North West-Regional Chief Director Land Claims Commissioner	10	September 2012	
Mr Pieter Louw	Rustenburg Public Library	11	September 2012	
BRPM	BRPM Main Offices	12	September 2012	
Robega Village	Robega Village Community Office	13	September 2012	
Chaneng Village Post Office	Chaneng Village Post Office	14	September 2012	
Ms. Reotshepile Tlhapane	Electronic	15	September 2012	
Mr. Dewald Fourie	Electronic	16	September 2012	
Mrs.Tshego Tyira,	RBPlat	17	September 2012	
SRK Library	SRK	18	September 2012	
SRK File	SRK	19	September 2012	

Approval Signature: