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CONSULTING

SCOPING REPORT FOR THE PROPOSED EXTENSION OF THE TWO RIVERS PLATINUM MINING RIGHT AREA, STEELPOORT, LIMPOPO PROVINCE

Various portions of farms Tweefontein 360KT, Dwarsrivier 372 KT, Kalkfontein 367 KT and Buffelshoek 368 KT, Steelpoort, Limpopo Province

DMR REF: LP 178 MR

MSC REF: MSC/57/18/TRP

18 JULY 2018

Submitted as part of an application process for environmental authorisation in terms of the National Environmental Management Act (Act 107 of 1998) [as amended] in respect of listed activities that have been triggered by application in terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) [as amended]

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DOCUMENT HISTORY

Document Control, Quality Control and Disclaimer

Report	SCOPING REPORT FOR THE PROPOSED EXTENTION OF THE TWO RIVERS PLATINUM MINING RIGHT AREA		
Client	Two Rivers Platinum (Pty) Ltd		
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Responsible person	Date	Position
Vhutshilo V. Mushiana	22 March 2018	Environmental Manager
R. S. Mellett	20 March 2018	Head Projects – Malan Scholes Consulting
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BASIS OF REPORT

This document has been prepared by Malan Scholes Consulting (Pty) Ltd (MSC) with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it in accordance with the appointment from the applicant.

This document has been prepared in accordance with the Department of Mineral Resources (DMR) Scoping Report template format, and was informed by the guidelines posted on the official DMR website. This is in accordance with the requirements of the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA). Given this, MSC has included additional information in the Introduction section of the report that it deems necessary and relevant to setting the scene for the environmental impact assessment (EIA) process. In addition, this report has been compiled in line with the requirements of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and EIA regulations (2014), as amended.

The information contained in this report is relevant only to the specific project area and plan. It cannot be relied on for any other purpose or by any other person.

Information reported herein may be based on the interpretation of public domain data collected by MSC and/or information supplied by the applicant and/or its other advisors and associates. The data has been accepted in good faith as being accurate and valid.

This document may contain information of a specialised and/or highly technical nature and the reader is advised to seek clarification on any elements which may be unclear to it.

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH EXTENSION OF THE TWO RIVER PLATINUM MINING AREA, STEELPOORT, LIMPOPO PROVINCE

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED)

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FILE REFERENCE NUMBER SAMRAD: LP 178 MR

EXECUTIVE SUMMARY

Malan Scholes Consulting (Pty) Ltd (MSC) was appointed by Two Rivers Platinum (Pty) Ltd to undertake the environmental authorisation process to extent the Two Rivers Platinum (TRP) mining right to include the Tamboti Mining Right Area and Prospecting Right Areas. Two Rivers Platinum (TRP) is a Joint Venture (JV) between African Rainbow Minerals (ARM) and Impala Platinum. The mine is located in the Steelpoort area within the Greater Tubatse Local and Sekhukhune District Municipalities, approximately 20 km south-west of the town of Steelpoort, in the Limpopo Province.

Two Rivers Platinum has a New Order Mining Right (LP 178 MR) and Environmental Management Programme (approved 30 July 2015) to explore and mine the Platinum Group Metals (PGM's), chrome and other precious metals (gold and silver), and associated base metals and ores thereof on portions of the farm Dwarsrivier 373 KT, Tweefontein 360 KT, Buffelshoek 368 KT and Kalkfontein 367 KT. The mine intent to extent the current mining area into the Tamboti Mining Right (LP 165 MR) located on Remaining Extent of the Farm Kalkfontein 367KT and the Tamboti Prospecting Right (LP 2125 PR) located on Portion 1,2,3,4,5,6,8,9,10 and 11 of the Farm Kalkfontein 367 KT. The proposed mining right area is presented in Figure 1. The aim of the proposed inclusion, is to be able to extend the existing underground workings and increase the current Life of Mine (LoM).

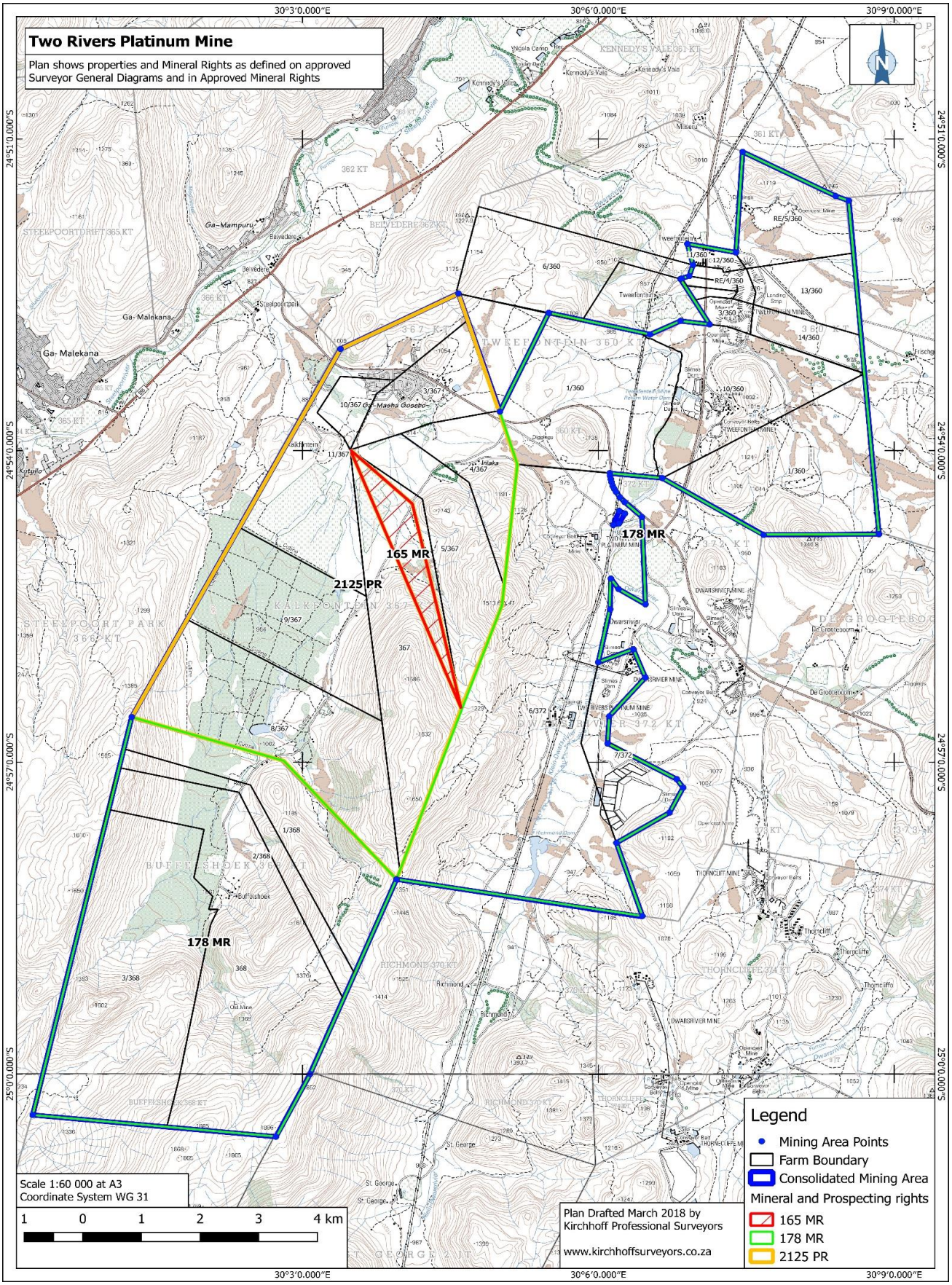

Figure 1: Mining Right Area

Activities at TRP commenced in 2003 with bulk sampling for a feasibility study. Trail mining operations and preliminary access development took place in 2004. The mining plan was submitted to the JV Board in December 2004, where after the project was released in June 2005 and construction commenced. Currently, the Upper Group 2 (UG2) is being mined from the underground via two portals, namely the Main decline and the North decline. The existing processing plant on site produces PGM concentrate.

It is the intention of TRP to extend the mining operations to sustain the UG2 production and grow the Merensky production. The proposed expanded mining operations are a westward down-dip and northward strike extension of the existing operations extend across most of the Kalkfontein property. The proposed extension will be accessed via the two existing underground section (i.e. North and Main decline).

The depth of minerals extends from surface outcrop at an elevation of approximately 900m above mean sea level to an elevation of between 750m and 400m from north to south, respectively. Because of the hilly nature of the topography, depth from surface may be up to 1000m. Trackless Bord and Pillar type mining methods are utilised at shallow to intermediate depths where a sufficiently wide mining cut is indicated. A mining section consists of 8-12 metre bords, with pillar sizes increasing with depth below surface. These bords are mined principally in a strike direction, except when re-establishing sections with geological disturbances (faults, dykes, potholes etc.).

Stoping sections exercise a multi-cycle operation during a shift. The full mining cycle in an eight bord section comprises two faces being drilled, two faces being cleaned, two faces being supported, with two faces standing idle. All the various phases are decoupled from one another, which assists in productivity. The two faces standing idle are essential when geological discontinuities are encountered as this provides additional face flexibility. A standard trackless Bord and Pillar section at TRP produces approximately 22,000 RoM tons of ore per month. This modular design allows production targets to be specified per shaft in terms of the number of Bord and Pillar sections required.

A schematic representation of the flow of ore mined from the two declines (i.e. North and Main) is presented in Figure 2 below. Existing Ventilation shafts will be utilized for the proposed expansion. Ore is mined from the production sections and transported by means of Load Haul Dumpers (LHD's) to a tipping facility located at the tail end of the nearest strike conveyor. The ore is transported via the strike conveyor system, along the strike towards the primary decline. Ore handling on surface is performed by either an overland conveyor system or by trucking, to the processing plant for processing, as per current operations. Waste rock and slims are disposed at the current waste rock dump or slims dam. Product is transported to the intended market.

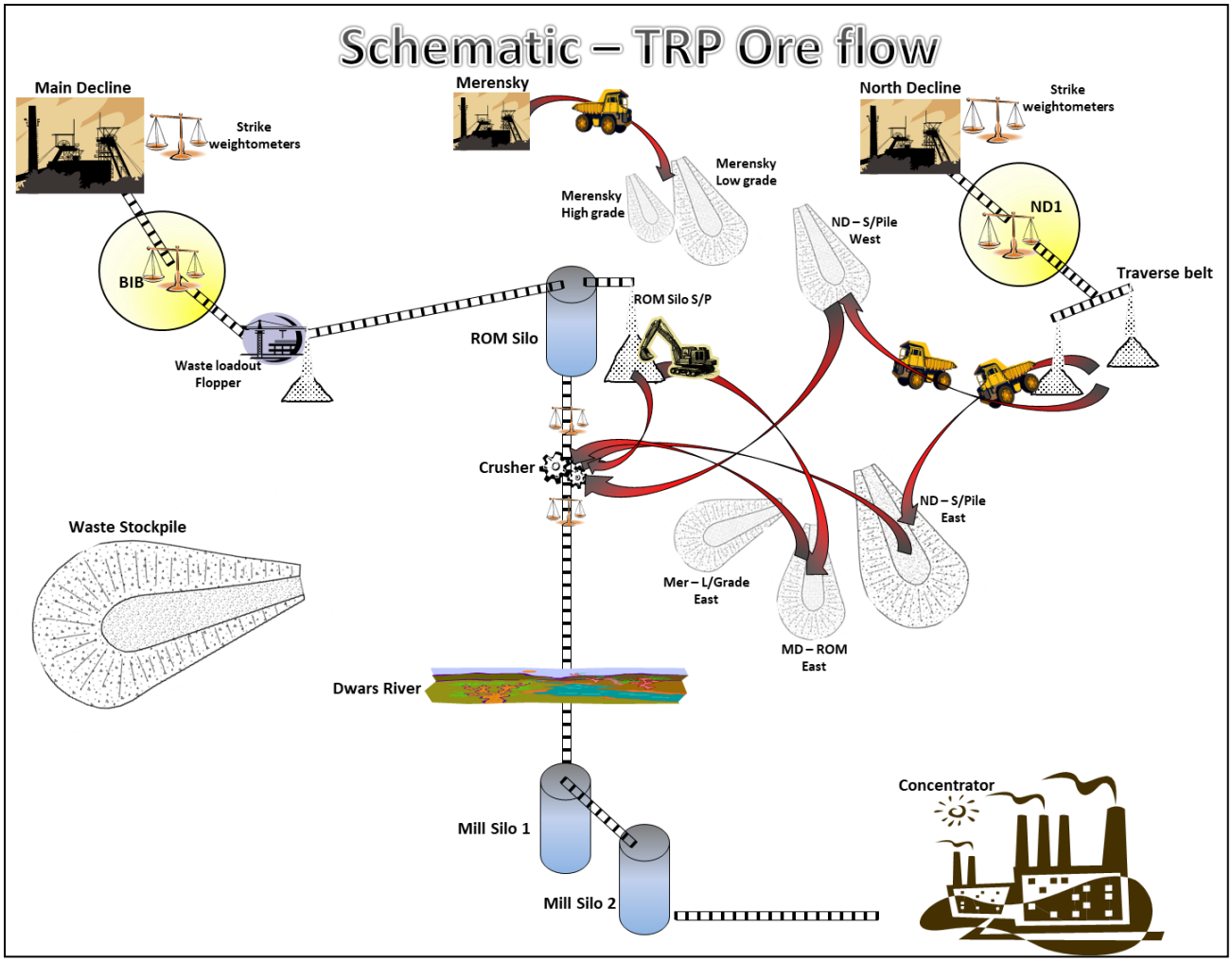

Figure 2: Schematic – TRP Ore Flow

The table below is a summary of the proposed TRP expansion activities.

Table 1: Description of the properties involved in the current application

APPLICATION	MINING ACTIVITY	FARM PORTIONS INVOLVED	MINING RIGHTS
UG2 and Merensky Expansion	Underground mining of the Merensky reef	Dwarsrivier, Kalkfontein and Buffelshoek via the Merensky North decline on Dwarsrivier (no new surface infrastructure on Kalkfontein)	TRP's existing mining right area as well as transferred prospecting and mining rights from Kalkfontein. Application in progress to convert the prospecting to mining rights.
	Expansion of underground mining of the UG2 reef	Dwarsrivier, Kalkfontein, Buffelshoek and Tweefontein via existing declines (no new infrastructure on Kalkfontein & Tweefontein)	TRP's existing mining right area as well as transferred prospecting and mining rights from Kalkfontein. Application in progress to convert the prospecting to mining rights

Legislative Requirements

The most important legislation applicable to the proposed project are the following:

- *National Environmental Management Act (No. 107 of 1998) [as amended]*

Section 28 (1)

Duty of Care and responsibilities to minimise and remediate environmental degradation. EIA Regulations, 2017 (Government Notices 983 and 984) [as amended]

- *EIA Regulations, 2014 (Government Notices 982) [as amended]*

The proposed construction, operational and closure activities of the proposed development triggers the following listed activity that are listed in the EIA regulations for which a Scoping and Environmental Impact Assessment (EIA) process must be conducted:

Activity 17:

Any activity including the operation of that activity which requires a mining right as contemplated in Section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which and exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

- *Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) [as amended]*
    - In order to apply for a mining permit, an application was submitted on the Department of Mineral Resources' Samrad online application system.
- *National Water Act (Act No.36 of 1998) [as amended]*
    - Section 19: Prevention and remedying effects of pollution
- *National Environmental Waste Act (Act No. 59 of 2008) [as amended]*
    - Section 16: General duty in respect of waste management
- *List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment as promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended];*
- *Waste Classification and Management Regulations and Norms and Standards for the assessment of for landfill disposal and for disposal of waste to landfill, 2013 (Government Notice 634 – 635 of 2013) promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended];*
- *Regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation (GN R. 632 of 2015);*
- *Mine Health and Safety Act, 1996 (Act No. 29 of 1996) [as amended];*

- *National Heritage Resources Act, 1999 (Act No. 25 of 1999);*
- *National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) [as amended];*
- *National Dust Control Regulations, 2013 (Government Notice 827 of 2013);*
- *Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended];*
- *National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) [as amended];*
- *Alien and Invasive Species Regulations (Government Notice 598 of 2014) and Alien and Invasive Species List, 2016 in terms of NEMBA (Government Notice 864 of 2016);*
- *Conservation of Agricultural Resources Act (no. 43 of 1983);*
- *Deeds registries Act, 1937 (Act no. 47 of 1937) [as amended];*
- *Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended];*
- *Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995); and*
- *Other relevant national, provincial, district and local municipality legislation and guidelines that may be applicable to the application. Some of these are discussed in the next section.*

Need and Desirability

Two Rivers Platinum (TRP) is establish mine with surface processing plants, waste storage facilities and two decline shafts (i.e. North and Main). The underground mining activities produce approximately 22 000 tons RoM monthly for the two sections. At the current mining rate the mine will run out of minable reserves in the near future. To ensure that the mine is kept operational, TRP has acquire the Tamboti mining and prospecting rights.

The mine has applied under section 11(1) of the MPRDA for the written consent of the Minster of Mineral Resources to transfer the extension area to TRP. The extension of the mining area will increase the life of mine to 25 years.

The main benefits of the Two River Platinum mine are:

- Direct economic benefits will be derived from wages, taxes and profits. Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees;
- Extending the life of mine resulting in increased job security to employees.
- Implementation of the proposed project will result in skills development associated with the mining method;

- It contributes to the economic welfare of the surrounding community by creating working opportunities, in-house training to the regional population, creation of school and sport facilities, education and housing assistance and medical and clinical facilities;
- It contributes to the upliftment of living standards and the health and safety of the local community.
- The project will result in economic mining of a known resources as existing surface and underground infrastructure will be utilised.
- The net benefit to South Africa is a product produced for the world commodity market, earning South Africa the necessary foreign exchange and capital needed for a healthy economy and further capital investments in development projects for the long-term future of the country.

The project is aligned with the objectives of the MPRDA (Act 28 of 2002)

- To promote economic growth and mineral development in the Republic
- To promote employment and advance the social and economic welfare of all South Africans
- To ensure that the nation's mineral resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and
- To ensure that holders of mining rights contribute towards the social-economic development of the area in which they are operating

On the 20 October 2014, the Department of Environmental Affairs published a Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010, in Government Notice 891 of 2014. The key components are listed and discussed below:

- Securing ecological sustainable development and use of natural resources
- Promoting justifiable economic and social development.

Ecological sustainable developments and use of natural resources

The project area has been selected on the basis of the presence of economically mineable resources adjacent to the existing underground mining area. The underground mining areas will only be extended into the adjacent properties. The existing surface infrastructure (as described in this report) will be utilised for the processing of ore and disposal of waste. No surface infrastructure will be constructed. It is anticipated that no additional surface impact will take place. No additional impacts are anticipated on sensitive areas (i.e. aquatic ecosystems, biodiversity, heritage and social).

Some impacts on groundwater resources is anticipated and the impact will be further investigated in the EIA phase by the appointed relevant specialist. The results of these studies will be included in the EIA. Measures to mitigate the impacts to these resources will be included in the EIA.

Promoting justifiable economic and social development.

Community/society priorities are officially expressed through public documents including the provincial growth and development strategy and spatial development framework documents. The TRP project falls within the Greater Tubatse Municipality and forms part of the Greater Tubatse Municipality LED Strategy. Four programmes for economic development. This comprises (1) Sector Development, (2) Economic Infrastructure Support, (3) Social Development, and (4) Institutional/Governance Reform. The projects that have been identified in the LED are aimed at economic development by ensuring job opportunities are created, jobs security is created, skills development takes place and that opportunities are created for SMME development. Mining plays an important part in the sector development of the LED strategy. Mines contributes towards the socio-economic development of the region through social-upliftment and job creation as primary agents.

The proposed project will benefit society and the surrounding communities both directly and indirectly by providing job security at the proposed operation and through the extraction of mineral resources and beneficiation of mineral resources within Limpopo. Direct economic benefits will be derived from wages, taxes and profits. Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees. The proposed development will also ensure local economic development through the implementation of projects identified in the Social and Labour Plan. TRP is fully committed to implementing development plans and projects that will facilitate local community and rural development in the area surrounding its project in line with the provisions of the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry.

Alternatives

According to the Western Cape Department of Environmental Affairs and Development Planning's (WC DEADP) Guideline on Need and Desirability: EIA Guideline and Information Document Series (2011), to describe the need for a development, it must be determined whether it is the right time for locating the type of land use and/or activity being proposed. To describe the desirability for a development, it must be determined, whether it is the right place for locating the type of land use and/or activity being proposed. Need and desirability can be equated to the concept of wise use of land which can be determined through asking the question: "what is the most sustainable use of land?"

The "no-go" alternative refers to the option of not going ahead with the proposed project. This would mean that there would be no change to the current status of the site and the positive socio-economic

benefits of the proposed project would not be realised. The “no-go” alternative will result in closure of the mine.

The project alternatives being considered as feasible alternatives therefore include:

- *The site on which the proposed underground mining sections are to be located (underground layout alternatives);*
- *The mining method (technology alternatives)*
- *Design alternatives; and*
- Not implementing the mining activities (“*No-go” alternative*).

Public Participation

This section describes the public participation process (PPP) undertaken to date in line with Chapter 6 of the EIA Regulations (2014). The process is undertaken to ensure compliance with the requirements in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [as amended] (MPRDA) and the Environmental Impact Assessment Regulations (2014) [as amended]. The intention of the PPP was to inform I&APs, in sufficient detail, of the proposed project in order that I&APs may contribute meaningfully to the EIA process.

The PPP to date has included notification of I&APs through distribution of a Background Information Document (BID), placement of newspaper advertisements, placement of site, focussed engagement and meetings with community structures and public scoping meetings. A key aspect of public consultation is the notification of landowners, occupier and users within and adjacent to the application area. More detail in this regard to the process followed is provided below.

Interested and affected party (I&AP) database

As part of the PPP an I&AP database has been developed for the project. I&APs identified for the project include:

- landowners, lawful occupiers and ward councillors within and adjacent to the mining right application area
- community leaders and community structures
- non-government organisations and associations working in the area
- mines, industry and businesses in the area
- Parastatals
- commenting authorities:
    - Limpopo Department of Agriculture and Rural Development (LDARD)

- Department of Water and Sanitation (DWS)
- Department of Agriculture, Forestry and Fisheries (DAFF)
- Department of Rural Development and Land Reform (DRDLR): Land Claims Commissioner
- South Africa Heritage Resource Agency (SAHRA)
- Provincial Heritage Resources Authority Gauteng (PHRAG)
- Department of Economic Development, Environment and Tourism
- Greater Tubatse Municipality

I&APs who attended meetings and /or submitted contact details have been registered on the I&AP database. The latest copy of the database is included in Appendix F-i. The database will be updated on an on-going basis throughout the process.

Mining Right Application

- A copy of the scoping report has been made available for a 30-day review and comment period, as from 18 July to 18 August 2018.
- An electronic copy of the scoping can be downloaded. Please contact Malan Scholes Consulting (projects@malanscholesconsulting.co.za) for link.
- Please send all comments to projects@malanscholesconsulting.co.za

Registration of any I&AP's can take place by registering on the I&AP's database, by sending details of the I&AP to MSC. Please feel welcome to contact us should you have further queries or would need additional clarification.

Advertisements and site notices

During the initiation of the PPP, advertisements were placed in the following newspaper:

- Steelburger on Friday 9 March 2018 (local newspaper)

A copy advertisements placed are included in Appendix F-ii.

Site notices (5) in English, were placed at key positions in and adjacent to the mining right area on 8 March 2018. A copy of the site notices are presented in Appendix F-iii with the location of the notices presented in Appendix F-iv.

Additional Advertisements and site Notices.

Announcement of the public review period will be done through the following advertisement and placement of site notices.

- Steelburger on Friday 20 July 2018 (local newspaper)

Site Notices will be placed at key positions in and adjacent to the mining right area on 16 an 17 July 2018. Copy of the advertisement, site notice and placements of site notices will be included into the Final Scoping Report for submission to the DMR.

Background Information Document (BID)

A BID document was compiled for the proposed project. The purpose of the BID was to inform I&APs about the proposed project, the EIA process, environmental attributes, possible impacts and means of providing input into the EIA process. The BID was made available in English and included details of the public scoping meetings. The BID was distributed at the public scoping meetings. The BID is presented in Appendix F-v.

Public Meetings

The purpose of holding the public scoping meetings was to:

- to provide an overview of the project and related EIA process
- to provide I&APs with an opportunity to:
    - raise any issues and concerns (both positive or negative)
    - provide input on any environmental sensitivities and potential impacts
    - to record issues within the formal assessment process so that they can be addressed during the course of the EIA
- to outline the way forward.

The date, venue and time of the public scoping meetings are provided below.

Date	Venue	Time
Friday 23 March 2018	Ga-Malekana Community Hall	16h00 – 17h30

The meetings were held in English due to the diversity of languages present at the meetings with translation taking place where required. Copies of the BID were made available to attendees at the meetings. Minutes of the meeting is included in Appendix F-vi.

Community Leaders Meeting

A meeting with community leaders, Royal houses and community representatives were arranged as provided below.

Date	Venue	Time
Thursday 24 May 2018	Chrome Valley Lodge	10h00 – 12h00

The proposed project was presented to the community leaders and to obtain permission from the community leaders to arrange community public meetings. Minutes of the meeting is included in Appendix F-vii.

Community Scoping Meetings

Additional public meetings were arranged through the community structures (i.e. Community Leaders) with the Kalkfontein community and the Buffelshoek community as presented below.

Date	Venue	Time
Thursday 7 June 2018	Kalkfontein Community Hall	10h00 – 12h00
Thursday 7 June 2018	Buffelshoek Community Hall	13h00 – 15h00

The meetings were presented in English due to the diversity of languages present at the meetings with translation taking place where required. Copies of the BID were made available to attendees at the meetings. Minutes of the meeting is included in Appendix F-viii. Proof of arrangement through the community structures are presented in Appendix F-ix.

Review of the Draft Basic Assessment

I&AP review of Scoping Report

The Scoping Report is herewith released for a period of 30 days from 18 July 2018 to 18 August 2018. Hard copies of the Scoping Report is herewith submitted to all organs of state and relevant authorities. In addition copies are placed at the following locations as presented below:

Venue	Location
Twee Rivers Mine	SHEQ Offices
Kalfontein Tribal Office	Tribal Office
Buffelshoek Tribal Office	Tribal Office
Malan Scholes Consulting Office	Reception First Floor, One-On-Jameson, 1 Jameson Avenue, Melrose Estate, Johannesburg

In addition, registered I&APs have been notified of the availability of the Scoping Report for review via SMS and E-mail notifications. Electronic copies of the Scoping Report will be made available on request. Where meetings take place during the review period, hard copies of the executive summary will be provided.

Next Phase - Way forward

All comments received from I&APs and organs of state and responses sent will be included in the final Scoping Report to be submitted to the Competent Authority (CA).

DMR review of scoping report

On completion of the 30-day review period, a Final Scoping Report will be compiled which will include comments received during the I&AP review period. The report will be submitted to the DMR for its review via the online SAMRAD system.

Summary of Issues raised

A high level summary of the issues/concerns raised during the public meetings are presented below.

- Impact on groundwater and surface water
- Impact on biodiversity
- Jobs creation
    - Benefit to the community, Skills development
- Damage to Houses – Cracks

- Employment and the number of employees (Empowerment).

Specialist studies

As part of the Environmental Impact Assessment phase for the extension of the TRP existing mining right area the following specialist study will be completed:

- Geohydrological Study

For description of the baseline information, the existing specialist studies form the approved (GCS) EMP/EIA (30 July 2015) will be used as reference.

Potential Impacts Associated with the Proposed Activity

BIOPHYSICAL/SOCIO-ECONOMIC ASPECT	POTENTIAL IMPACT	SPECIALIST INPUT (WHERE RELEVANT)
Geology	**Loss and sterilisation of mineral resources:** The project has the potential to access mineral resources but also result in the loss and sterilisation of mineral resources. The project has the potential to sterilise mineral resources through the disposal of mineral resources onto mineralised waste facilities (waste rock dumps).	Will be addressed by project team. Existing EMPr and specialist studies.
Topography	**Placement of waster rock and tailings:** The project has the potential to alter the topography. Existing approved facilities to be utilised for waste rock and tailings.	Will be addressed by project team. Existing EMPr and specialist studies.
Soils and land capability	**Loss of soil and land capability:** The project has the potential to compromise soil resources through physical disturbance (erosion and compaction) and/or pollution. No new surface infrastructure will be constructed.	Will be addressed by project team. Existing EMPr and specialist studies.
Biodiversity	**Loss of biodiversity (terrestrial and aquatic):** No new impact is expected on biodiversity. No surface infrastructure will be constructed. Existing infrastructure will be utilised.	Will be addressed by project team. Existing EMPr and specialist studies.
Surface water	**Alteration of natural drainage patterns and pollution:** the proposed project is only for the extension of underground areas and no impact is expected on surface water. Existing surface infrastructure will be utilised.	Will be addressed by project team. Existing EMPr and specialist studies.
Groundwater	**Groundwater contamination and lowering of groundwater levels:** The project has the potential to contaminate groundwater resources and to lower	Geo-hydrological study

	groundwater levels through abstraction, dewatering of the aquafer.	
Air	**Air quality:** The project will utilise the existing approved infrastructure. No additional impact on air quality is expected from the proposed project. No increase in production is anticipated currently.	Will be addressed by project team. Existing EMPr and specialist studies.
Noise	**Disturbing noise levels:** The project has the potential to cause noise pollution through the mining activities. No additional noise pollution is anticipated as the proposed project will only be for underground mining. Existing surface infrastructure will be utilised.	Will be addressed by project team. Existing EMPr and specialist studies.
Traffic	**Road disturbance and traffic safety:** No increase in traffic is anticipated as a direct result of the proposed project.	Will be addressed by project team. Existing EMPr and specialist studies.
Vibration	**Vibration impact:** The project has the potential to cause vibration as a result of underground blasting taking place.	Historical studies and project team. Existing EMPr and specialist studies.
Heritage/cultural and palaeontological resources	**Loss of heritage/cultural and palaeontological resources:** The project do have the potential to damage heritage/cultural and palaeontological resources as no surface infrastructure will be constructed	No study required
Socio-economic	**Positive and negative socio-economic impact:** The project has the potential for positive and negative socio-economic impacts. Positive impacts include job creation and stimulation of local and regional economy as well as a parallel economy to mining. Negative impacts include the influx of job seekers and related issues of crime, disease and disruption to social structures	Historical studies and project team. Existing EMPr and specialist studies.
Land use	**Change in land use:** The proposed project do not have the potential to impact on surrounding land uses such as residential areas as no surface infrastructure will be constructed.	Historical studies and project team. Existing EMPr and specialist studies.

Reasoned Opinion of the EAP

Based on the findings of the preliminary impact assessment during the scoping phase, the EAP is of the opinion that the scoping phase be approved, due to the positive social and economic impacts it can have on the local and regional communities. The potential negative impacts will be investigated in the EIA phase and mitigation measures for the impacts will be developed and included in the EMP.

Recommendations

To achieve appropriate environmental management standards and ensure that the findings of the environmental studies are implemented through physical measures, the recommendations from the scoping report are included within the Environmental Management Programme (EMP). The EMP will be based on all the information to be contained in the Environmental Impact Report (EIR) as well as all the specialists' reports.

Conclusion

The EIA process is currently in the scoping phase. The project has the potential to impact on the biophysical, cultural and socio-economic both within and surrounding project area. Input received during the scoping phase will allow for the meaningful assessment of all relevant biophysical, cultural and socio-economic issues. Potential impacts will be investigated by studies. Stakeholder engagement will continue throughout the EIA process. The Environmental Management Programme (EMP) will contain more detailed mitigation measures which will also be incorporated into the Environmental Impact Report (EIR).

The proposed mitigation measures, if implemented, will reduce the significance of the majority of the identified impacts. It is therefore the recommended based on the assessment of the current available information, that the Scoping Report for the proposed development be accepted by the Competent Authority.

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ABBREVIATIONS

Abbreviation	Description
ARC	Agricultural Research Council
BoQ	Bill of Quantities
BPEO	Best Practicable Environmental Option
CS	Community Survey
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DFS	Definitive Feasibility Study
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act (Act 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EMPR	Environmental Management Programme
FAII	Fish Assemblage Integrity Index
FTE	Full Time Equivalent
GNR	Government Notice Regulation
I&APs	Interested and Affected Parties
IDP	Integrated Development Programme
IEM	Integrated Environmental Management
IHAS	Invertebrate Habitat Assessment System
IHIA	Intermediate Habitat Integrity Assessment
IWUL	Integrated Water Use License
IWULA	Integrated Water Use License Application
LOM	Life of Mine
MAMSL	Meter Above Mean Sea Level
MSC	Malan Scholes Consulting
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
MRA	Mining Right Application
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 39 of 2004

NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NFA	National Forest Act (Act 84 of 1998)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
PAIA	Promotion of Access to Information Act (Act 2 of 2000)
PAJA	Promotion of Administrative Justice Act (Act 3 of 2000)
PES	Present Ecological State
PGMs	Platinum-Group Metals
PM10	Thoracic Particulate Matter
PM2.5	Inhalable Particulate Matter
PPP	Public Participation Process
ROM	Run of Mine
RVI	Riparian Vegetation Index
SAHRA	South African Heritage Resources Agency
SANRAL	South African National Roads Agency Limited
SANS	South African National Standard
SASS	South African Scoring System
TSF	Tailings Storage Facility
TPA	Tons Per Annum
TSP	Total Suspended Particulates

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

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

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

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

OBJECTIVE OF THE SCOPING PROCESS

The objective of the scoping process is to, through a consultative process—

(a) identify the relevant policies and legislation relevant to the activity;
(b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
(c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
(d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
(e) identify the key issues to be addressed in the assessment phase;
(f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
(g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

SCOPING REPORT

INTRODUCTION

Malan Scholes Consulting (Pty) Ltd (MSC) was appointed by Two Rivers Platinum (Pty) Ltd to undertake the environmental authorisation process to extent the Two Rivers Platinum (TRP) mining right to include the Tamboti Mining Right Area and Prospecting Right Areas. Two Rivers Platinum (TRP) is a Joint Venture (JV) between African Rainbow Minerals (ARM) and Impala Platinum. The mine is located in the Steelpoort area within the Greater Tubatse Local and Sekhukhune District Municipalities, approximately 20 km south-west of the town of Steelpoort, in the Limpopo Province.

Two Rivers Platinum has a New Order Mining Right (LP 178 MR) and Environmental Management Programme (approved 30 July 2015) to explore and mine the Platinum Group Metals (PGM's), chrome and other precious metals (gold and silver), and associated base metals and ores thereof on portions of the farm Dwarsrivier 373 KT, Tweefontein 360 KT, Buffelshoek 368 KT and Kalkfontein 367 KT. The mine intent to extent the current mining area into the Tamboti Mining Right (LP 165 MR) located on Remaining Extent of the Farm Kalkfontein 367KT and the Tamboti Prospecting Right (LP 2125 PR). The proposed mining right area is presented in Figure 3 and 4.The aim of the proposed inclusion, is to be able to extend the existing underground workings and increase the current Life of Mine (LoM).

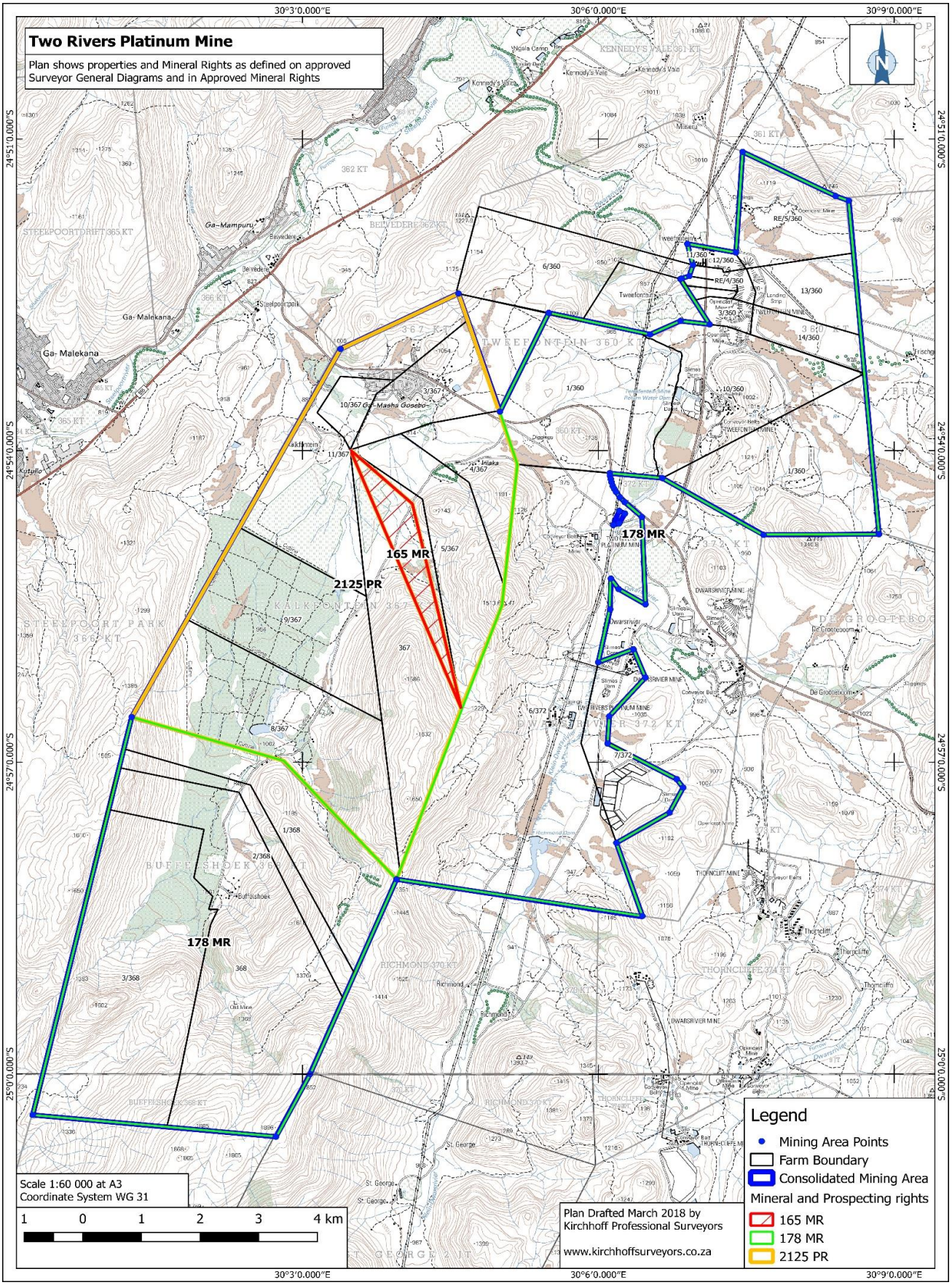

Figure 3: Mining Right Area

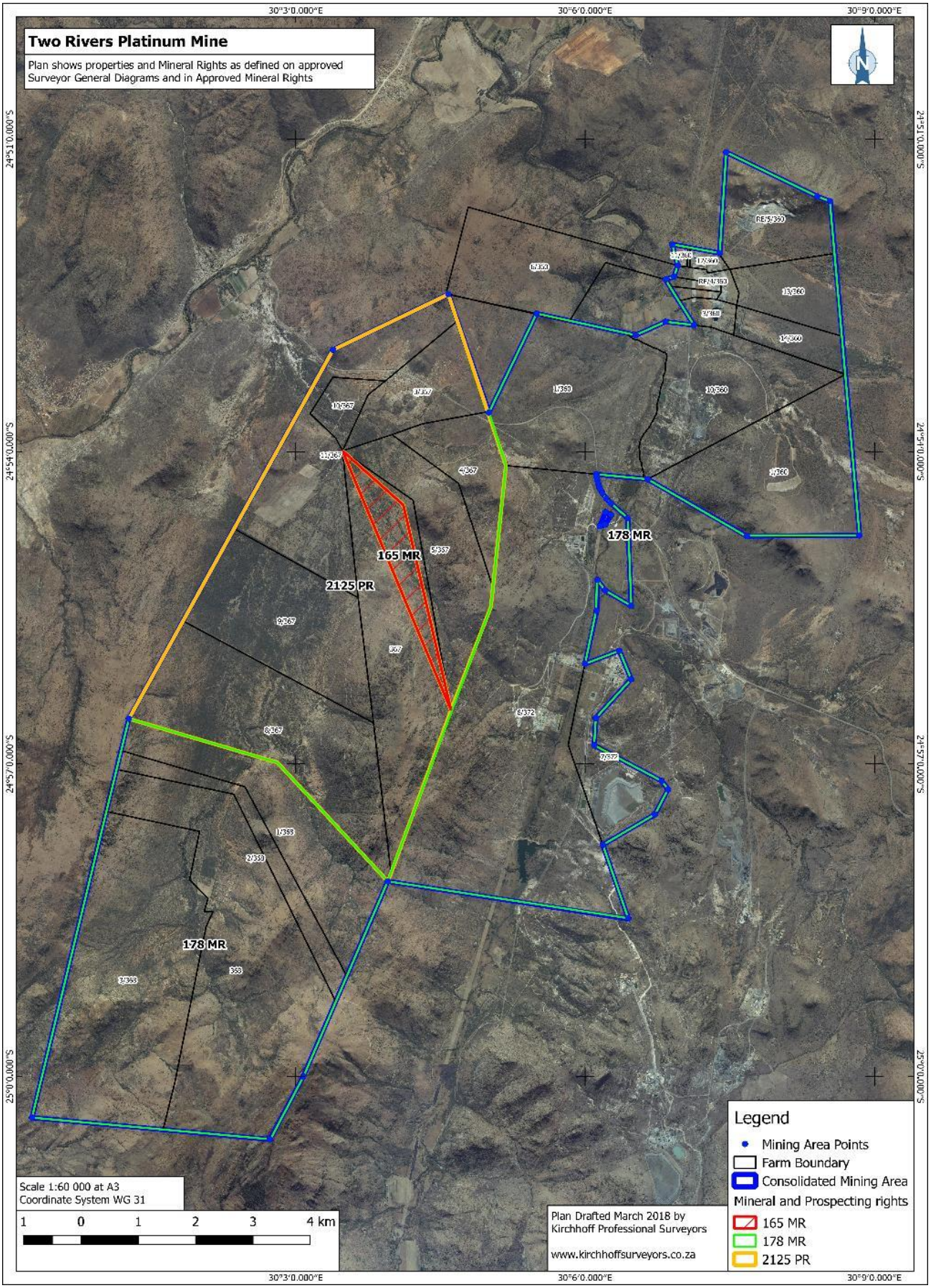

Figure 4: Mining Right Area

1. Contact Person and correspondence address

a) Details of:

i) The EAP who prepared the report

Name of The Practitioner: DuToit Wilken
Tel No.: +27 (0) 11 718 4600

Fax No.: +27 (0) 10 020 5034

e-mail address: dutoit@elemental-s.co.za

ii) Expertise of the EAP

(1) The qualifications of the EAP

(With evidence attached as Appendix A)

- University of Pretoria, MSc Geography – 2015
- University of Pretoria, BSc Hons Environmental Science – 2010
- University of Pretoria, BSc Environmental Science – 2009

(2) Summary of the EAPs' experience.

(Attach the EAP's curriculum vitae as Appendix B)

DuToit Wilken is an Environmental Scientist with more than 8 years of experience in applying the principles of Integrated Environmental Management, and in applying the Environmental Legislation to a number of development projects and initiatives in Southern Africa. He has co-ordinated and managed number of diverse projects and programs related to the Environment and Mining within both the public and private sectors and for national, multi-national and international companies. His interpersonal and organisational skills have enabled him to efficiently direct these projects from initiation to implementation.

A significant element of public participation is required throughout the life cycle of an EIA process. DuToit has successfully liaised with interested and affected parties, ensuring that all communication procedures and dialogues are open and transparent, and that capacity building is conducted where necessary. His proficient report-writing skills have been utilised for the compilation of a wide variety of reports, which include but is not limited to Basic Assessment Reports, Scoping and Environmental Impact Assessment Reports, Environmental Management Plans (Planning, Construction, Operation

and Closure), Environmental Audit Reports, Opportunities and Constraints Analyses, Waste License Applications, Water-Use Application Reports and Mining Right Applications.

Robyn Sally Mellett, the Environmental Scientist who is overseeing the project and is peer reviewing the project is a dedicated professional with over thirteen (15) years' experience in project management for an array of environmental related projects, including ensuring that planned mining projects obtained all necessary legal approvals and licensing prior to commencement. She has ten (10) years' experience in the mining sector, in three (3) countries, namely: Botswana, South Africa and Zimbabwe.

During her mining career, she has provided in-house support both strategic and operational to four (4) mining houses, namely: Aquarius Platinum (SA) (Pty) Ltd, Kumba Iron Ore, African Rainbow Minerals (Pty) Ltd and Sibanye-Stillwater. She has furthermore, played an environmental consulting role for several mining houses covering thirteen (13) different commodities, namely: Platinum Group Metals (PGMs), iron ore, gold, diamond, dolomite, lime, ferromanganese, coal, copper, nickel, cobalt, chrome and cement. She further, has two (2) years' experience in environmental consulting for the agriculture & residential sector. In addition, she has also played an advisory role in research, education, awareness and outreach in five (5) countries, namely: Afghanistan, Lesotho, South Africa, Swaziland and Taiwan. Currently, she is playing an environmental advisory role for Malan Scholes Consulting in South Africa.

2. Description of the property

Table 2: Description of the property

Farm Name:	Two River Plat Right (LP 178 MR) • Portion 1, 3, RE 4, Re of 5, 6, 9, 10, 11, 12, 13 and 14 of the farm Tweefontein 360 KT. • Portion 6 and 7 of the farm Dwarsrivier 372KT, Portion 1, 2, 3, 4, 5 and 6 of the Farm Kalkfontein 367 KT and the Farm Buffelshoek 368 KT. Tamboti Mining Right (LP 165 MR) • located on Remaining Extent of the Farm Kalkfontein 367KT: and Tamboti Prospecting Right (LP 2125 PR) • located on Portion 1,2,3,4,5,6,8,9,10 and 11 of the Farm Kalkfontein 367 KT.
Application area (Ha)	Hectares to be confirmed

Magisterial district:	Greater Tubatse Local and Sekhukhune District Municipalities	
Distance and direction from nearest town	Approximately 20 km south-west of the town of Steelpoort, in the Limpopo Province	
21-digit Surveyor General Code for each farm portion	Portion 1 of the farm Kalkfontein 367 KT	T0KT00000000036700001
	Portion 2 of the farm Kalkfontein 367 KT	T0KT00000000036700002
	Portion 3 of the farm Kalkfontein 367 KT	T0KT00000000036700003
	Portion 4 of the farm Kalkfontein 367 KT	T0KT00000000036700004
	Portion 5 of the farm Kalkfontein 367 KT	T0KT00000000036700005
	Portion 6 of the farm Kalkfontein 367 KT	T0KT00000000036700006
	Portion 8 of the farm Kalkfontein 367 KT	T0KT00000000036700008
	Portion 10 of the farm Kalkfontein 367 KT	T0KT00000000036700010
	Portion 11 of the farm Kalkfontein 367 KT	T0KT00000000036700011
	Remaining Extent of the farm Kalkfontein 367 KT	T0KT00000000036700000
	Portion 1 of the farm Buffelshoek 368 KT	T0KT00000000036800001
	Portion 2 of the farm Buffelshoek 368 KT	T0KT00000000036800002
	Portion 3 of the farm Buffelshoek 368 KT	T0KT00000000036800003
	Remaining Extent of the farm Buffelshoek 368KT	T0KT00000000036800000
	Portion 6 of the farm Dwarsrivier 372 KT	T0KT00000000037200006
	Portion 7 of the farm Dwarsrivier 372 KT	T0KT00000000037200007
	Remaining Extent of Portion 1 of the farm Tweefontein 360 KT	T0KT00000000036000001
	Portion 3 of the farm Tweefontein 360 KT	T0KT00000000036000003
	Remaining Extent of Portion 4 of the farm Tweefontein 360 KT	T0KT00000000036000004
	Remaining Extent of Portion 5 of the farm Tweefontein 360 KT	T0KT00000000036000005
	Portion 6 of the farm Tweefontein 360 KT	T0KT00000000036000006
	Portion 9 of the farm Tweefontein 360 KT	T0KT00000000036000009
	Portion 10 of the farm Tweefontein 360 KT	T0KT00000000036000010
	Portion 11 of the farm Tweefontein 360 KT	T0KT00000000036000011
	Portion 12 of the farm Tweefontein 360 KT	T0KT00000000036000012
	Portion 13 of the farm Tweefontein 360 KT	T0KT00000000036000013
	Portion 14 of the farm Tweefontein 360 KT	T0KT00000000036000014

3. Locality map

(Show nearest town, scale not smaller than 1:250000 attached as Appendix C) The locality map is also appended in Appendix C.

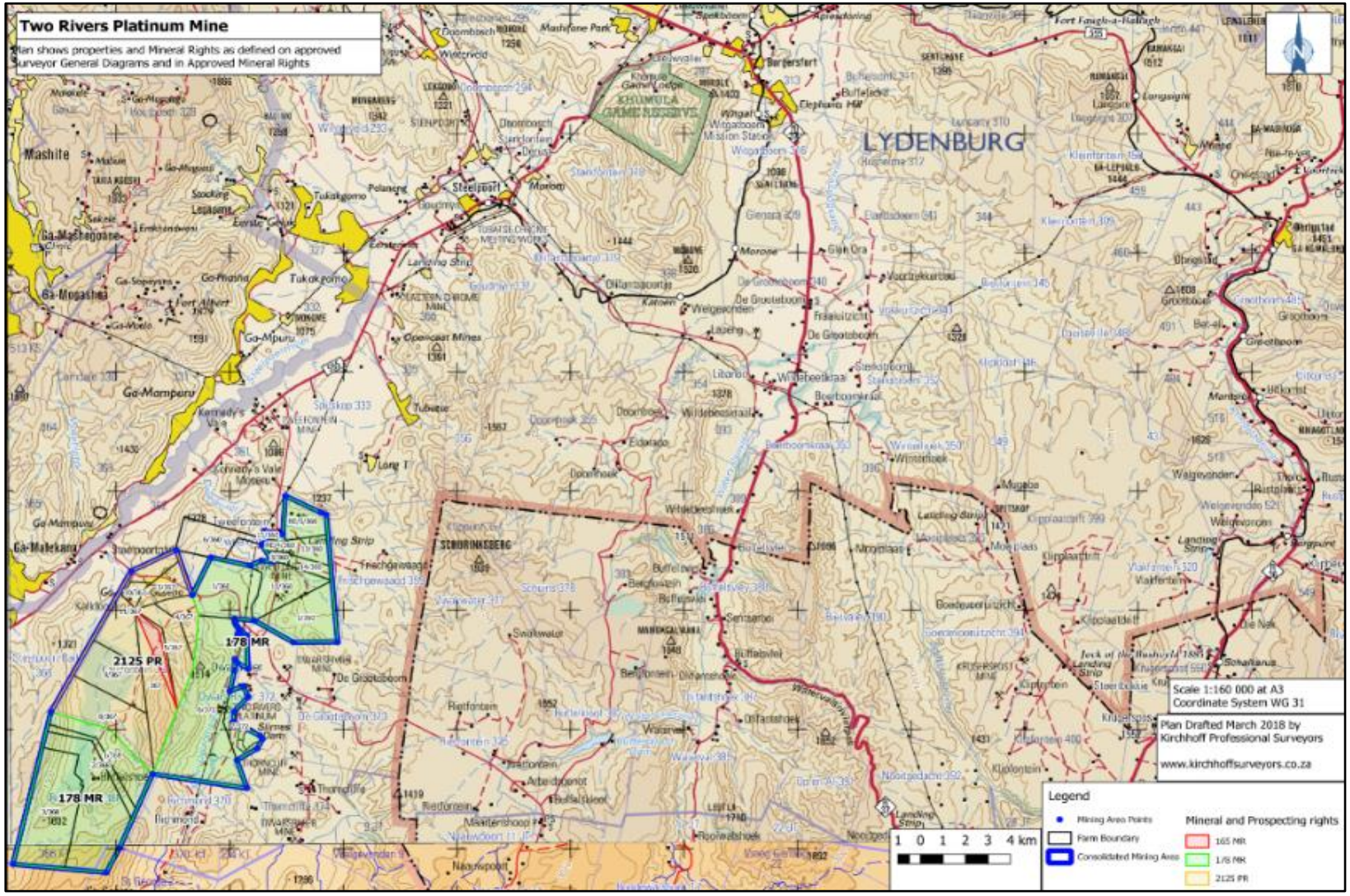

Figure 5: Locality of the Two Rivers Platinum Mine

4. Description of the scope of the proposed overall activity

iii) Listed and specified activities

(Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as Appendix D)

Table 3: Listed and specified activities

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT
CONSTRUCTION PHASE				
N/A				
OPERATIONAL PHASE				
Extending of underground mining area from the existing underground area into the proposed adjacent properties	To be determined	X	GNR: 984 Activity 17	
Drill and Blasting to be undertaken at the face of the bord sections	To be determined		NOT LISTED	
Transporting of ore by means of Load Haul Dumpers (LHD's) to a tipping facility	Exiting infrastructure		Approved Infrastructure	
Transporting of ore via the strike conveyor system, along the strike towards the primary decline	Exiting infrastructure		Approved Infrastructure	
Primary and secondary crushing of ore from underground sections	Exiting infrastructure		Approved Infrastructure	
Load and haul to stockpile areas. Stockpiling of ore	Exiting infrastructure		Approved Infrastructure	
Convey of ROM to Processing plant	Exiting infrastructure		Approved Infrastructure	

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT
Transportation/transfer of the waste rock from the shafts to the WRDs.	Exiting infrastructure		Approved Infrastructure	
Deposition of waste rock onto existing waste rock dump.	Exiting infrastructure		Approved Infrastructure	
Primary and secondary milling of ore for processing	Exiting infrastructure.		Approved Infrastructure	
Processing of RoM	Exiting infrastructure		Approved Infrastructure	
Transportation/transfer of tailings to existing Tailing Storage Facility	Exiting infrastructure		Approved Infrastructure	
Dust Suppression	Extent of dirt roads		NOT LISTED	
Transport of Product to market	N/A		NOT LISTED	

Table 4: Description of the EIA Regulations Listed Activities.

Legislation	Listed activities	Applicability of the activity	Competent Authority
NEMA and the EIA Regulations, 2014, as amended.	**GNR 984 Activities:** (17) Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including crushing.	Extension of existing mining right area. Converting of prospecting right into a mining right.	DMR – Limpopo Province

ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity)

Background

Malan Scholes Consulting (Pty) Ltd was appointed by Two Rivers Platinum (Pty) Ltd to undertake the environmental authorisation process to extent the Two Rivers Platinum (TRP) mining right to include the Tamboti Mining Right Area and Prospecting Right Areas.

Two Rivers Platinum (TRP) is a Joint Venture (JV) between African Rainbow Minerals (ARM) and Impala Platinum. The mine is located in the Steelpoort area within the Greater Tubatse Local and Sekhukhune District Municipalities, approximately 20 km south-west of the town of Steelpoort, in the Limpopo Province.

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Activities at TRP commenced in 2003 with bulk sampling for a feasibility study. Trail mining operations and preliminary access development took place in 2004. The mining plan was submitted to the JV Board in December 2004, where after the project was released in June 2005 and construction commenced. Currently, the Upper Group 2 (UG2) is being mined from the underground via two portals, namely the Main decline and the North decline. The existing processing plant on site produces PGM concentrate.

It is the intention of TRP to extend the mining operations to sustain their UG2 production and grow the Merensky production. The proposed expanded mining operations are a westward down-dip and northward strike extension of the existing operations extend across most of the Kalkfontein property. The proposed extension will be accessed via the existing underground section (i.e. North and Main decline).

The depth of minerals extends from surface outcrop at an elevation of approximately 900m above mean sea level to an elevation of between 750m and 400m from north to south, respectively. Because of the hilly nature of the topography, depth from surface may be up to 900m. Trackless Bord and Pillar type mining methods are utilised at shallow to intermediate depths where a sufficiently wide mining cut is indicated. A mining section consists of 8-12 metre bords, with pillar sizes increasing with depth below surface. These bords are mined principally in a strike direction, except when re-establishing sections with geological disturbances (faults, dykes, potholes etc.).

Stoping sections exercise a multi-cycle operation during a shift. The full mining cycle in an eight bord section comprises two faces being drilled, two faces being cleaned, two faces being supported, with two faces standing idle. All the various phases are decoupled from one another, which assists in productivity. The two faces standing idle are essential when geological discontinuities are encountered as this provides additional face flexibility. A standard trackless Bord and Pillar section at TRP produces approximately 22,000 RoM tons of ore per month. This modular design allows production targets to be specified per shaft in terms of the number of Bord and Pillar sections required.

A schematic representation of the flow of ore mined from the two declines (i.e. North and Main) is presented below. Existing Ventilation shafts will be utilised for the proposed expansion. Ore is mined from the production sections and transported by means of Load Haul Dumpers (LHD's) to a tipping facility located at the tail end of the nearest strike conveyor. The ore is transported via the strike conveyor system, along the strike towards the primary decline. Ore handling on surface is performed by either an overland conveyor system or by trucking, to the processing plant for processing, as per current operations. Waste rock and slims are disposed at the current waste rock dump or slims dam. Product is transported to the intended market.

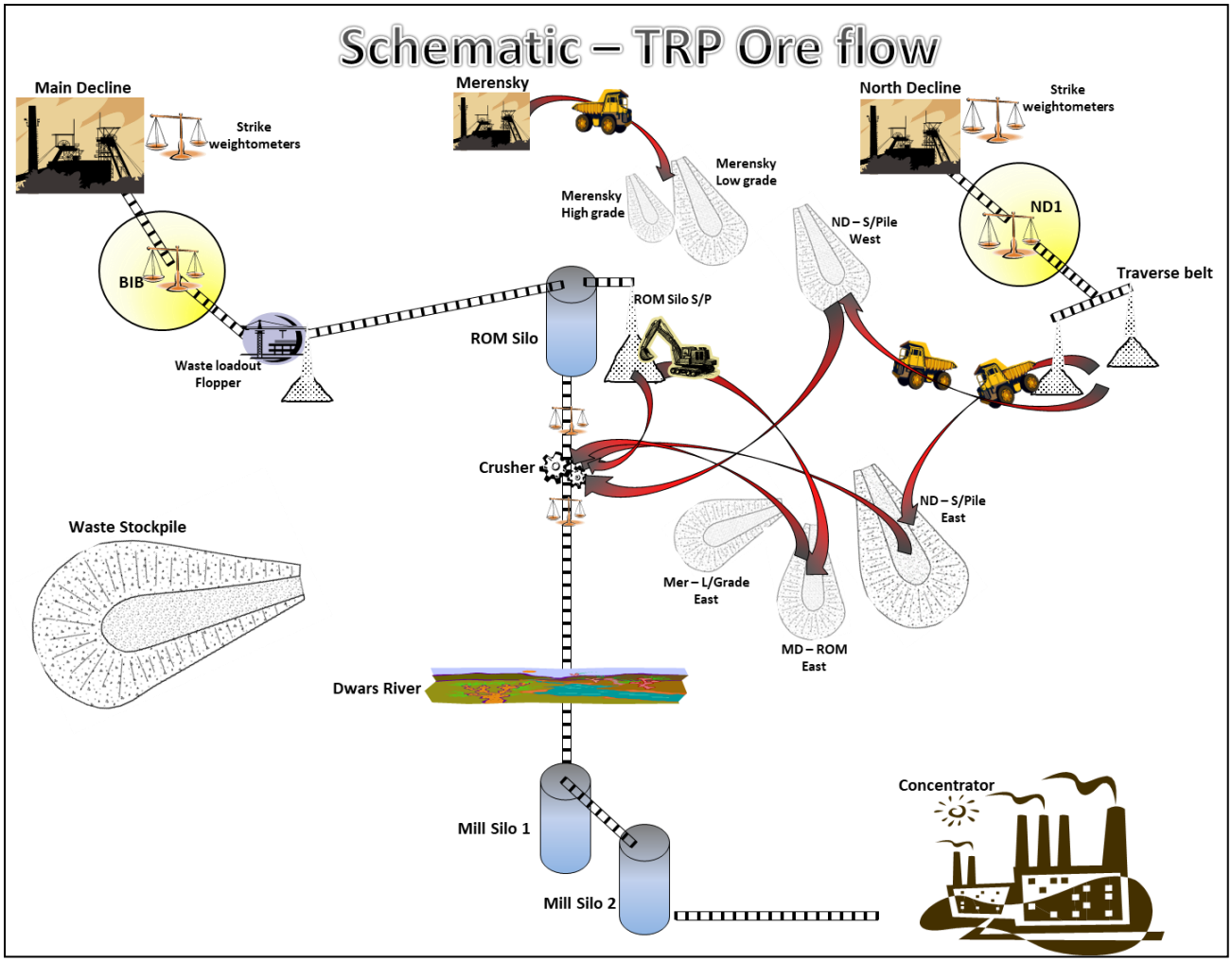


Figure 6: Schematic – TRP Ore Flow

MINING OPERATIONS

The estimated life of mine for the Two River Platinum mine and the extension is more than 25 years. Table 5 provides a summary of the mining rights and property descriptions for the existing mining right area and the proposed extension. The figure below is an indication of the schedule mining operations for the next 5 years.

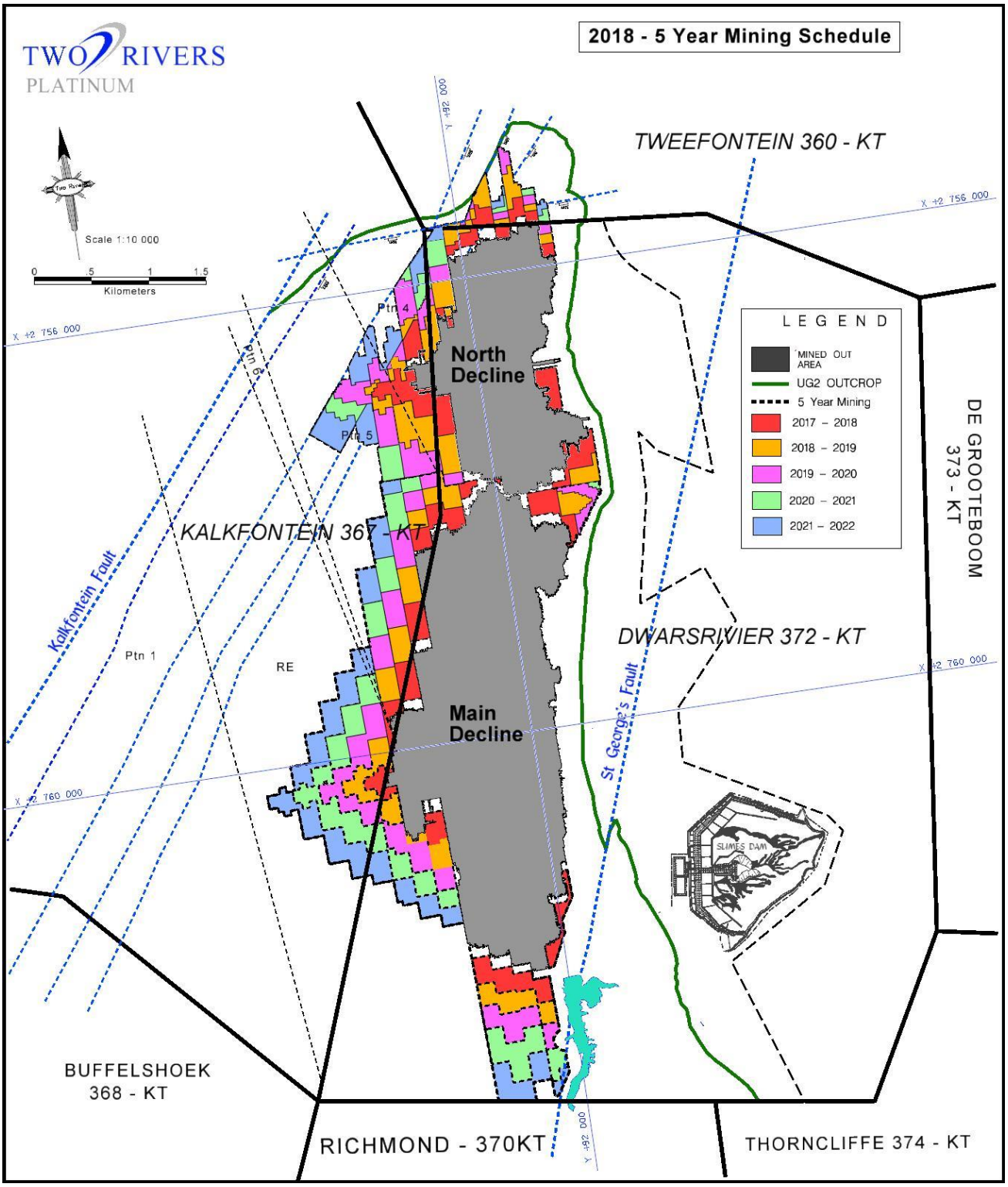


Figure 7: Mining Schedule

Table 5: Summary of Mining Rights

Farm Name	Farm Number	Portions	Mining Right Number
Kalkfontein	367 KT	1,2,3,4,5,6,8,9,10 and 11	**LP 30/5/1/2/3/2/1 (2125) PR**
Kalkfontein	367 KT	Remaining Extent	**LP 30/5/1/2/3/2/1 (165) MR**
Dwarsrivier	372 KT	6 and 7	**LP 30/5/1/2/3/2/1 (178) MR**
Tweefontein	360 KT	1, RE of 1, 3, RE of 4, RE of 5, 10, 11,12,13 and 14	
Kalkfontein	367 KT	1,2,3,4,5 and 6	
Buffelshoek	368 KT	All portions	

Below is a short description of the authorisations in place at Two River Platinum Mine.

Table 6: Existing Authorisations of Current Operation

AUTHORISATION	DESCRIPTION	DATE
DMR 4/2003 OT 5/3/2/545	Initial Mining Right (DMR)	4 March 2003
WUL 24053346. DWAF - NWA	Initial Water Use License (DWA)	13 Dec 2004
DWA, Nelspruit. 16/2/7/B400/C110/2	Gen authorisation – NWA, low level culvert to cross the Groot Dwars.	26 Jan 2006
File No 17.2.4.E -66. Mpumalanga - ECA	DDS Storage Silos	5 April 2006
File No 17.2.5 E-54. Mpumalanga - ECA	Richmond Road upgrade	4 Oct 2006
File No 17.2.5 E-54. Mpumalanga - ECA	Fuel and lubrication system	28 Nov 2006
DME Witbank OT6/2/2/472	Amendment EMP (North Decline)	22 January 2007
DMR Stamped EMP document.	Chrome Plant	27 Nov 2007
Ref 12/1/9-6/7-GS3. LDEDET - NEMA	Above ground diesel, explosive and oil storage tanks	15 Oct 2008

DME Ref MP 30/5/1/2/3/2/1 (234) EM OT6/2/2/472	Plant upgrade – crusher and flotation cells	21 January 2009
Ref 12/1/9-6/7-GCS10. LDEDET - NEMA	Above ground explosive emulsion tanks	31 December 2009
DMR Polokwane Ref: LP 30/5/1/3/2/1 (178) EM.	North Opencast (authorised, but not yet undertaken).	14 Dec 2010
DMR Limpopo. LP 178 MRC. MPRDA	New Order Mining Right	20 March 2013
DMR Limpopo. LP 178 MRC. MPRDA	Section 102 – Consolidated EIA ad EMP	30 July 2015
DWS - IWUL Licence No: 06/B41H/AJIGC/6098 File No: 27/2/2/B741/10/1	Integrated Water Use License (DWS)	October 2017

Mining Method

Two Rivers Platinum mine consists of two declines shafts (i.e. North and Main) each with an associated underground mining area. Trackless Bord and Pillar type mining methods are utilised at shallow to intermediate depths where a sufficiently wide mining cut is indicated. A mining section consists of 8-12 metre bords, with pillar sizes increasing with depth below surface. These bords are mined principally in a strike direction, except when re-establishing sections with geological disturbances (faults, dykes, potholes etc.).

Conventional drilling, blasting and scraper mining is utilised in the stoping and secondary development areas. Drilling of the main development faces are done by means of mechanised drill rigs, whilst stoping, secondary development and support drilling is done by pneumatic hand-held drills. Explosives are transported to the faces by means of an explosives carrier and charged up. The broken rock is loaded with load haul dumps (LHDs) and transported with dump trucks to the tipping points.

Stoping sections exercise a multi-cycle operation during a shift. The full mining cycle in an eight bord section comprises two faces being drilled, two faces being cleaned, two faces being supported, with two faces standing idle. All the various phases are decoupled from one another, which assists in productivity. The two faces standing idle are essential when geological discontinuities are encountered as this provides additional face flexibility. A standard trackless Bord and Pillar section at TRP produces approximately 22,000 RoM tons of ore per month. This modular design allows production targets to be specified per shaft in terms of the number of Bord and Pillar sections required.

Mining Process

Two Rivers Platinum has two decline shafts and a processing plant. The schematic representation of the Ore flow is presented in Figure 4. RoM from the North shaft is conveyed to a stockpile area from where it is fed into the RoM silo. The RoM from the Main shaft is conveyed to the RoM Silo. From the RoM silo the RoM is crushed before the two plant silos. The plant is fed from the silos at a constant rate.

The plant consists out of the following.

- Crushing & screening;
- Dense media separation (DMS) & waste rock disposal;
- Milling and flotation processes;
- Thickening of concentrate and tailings;
- Stockpiling and loading of product; and
- Tailings disposal.

Description of Mineral Processing Operations

Crushing

ROM and stockpile ore is crushed from 400mm to -90mm size in a primary jaw crusher. This is further crushed to -20mm in a cone crusher that operates in closed circuit with a vibrating screen. The secondary crusher was an addition to the circuit to enable the milling rate to be increased by providing the primary mill with smaller feed.

The primary and secondary crushing plants are located halfway between the Main Shaft complex and the TRP plant, such that ROM ore existing the Main decline is first conveyed ~1km to a coarse ore silo over a section of overland conveyor.

Ore from the crushing plant is subsequently conveyed to the fine ore silos, located at the TRP process facilities

Milling

The standard MF2 process flow is employed, namely mill - float; mill – float. There are two Vecor ball mills installed in series, individually powered by 5,200 kW Alstom motors:

- One 24ft (grinding length) Primary mill
- One 26ft (grinding length) secondary mill

Primary milling is to 35% -75 microns. Secondary milling is to 75% -75 microns. The mills are installed in closed circuit with cyclone banks, which perform the separation of material, based on the size, with the undersize (overflow) from the cyclones being directed to the flotation plant, while the oversize (cyclone underflow (being returned to the mills).

Flotation

The flotation circuit includes primary and secondary rougher flotation. This is followed by 3-stage cleaner flotation, i.e. cleaner, re-cleaner and re-re-cleaner flotation. The flotation process is subject to rigorous planned maintenance schedules.

Filtration

The concentrate from the flotation circuit is filtered by a single Larox vertical hydraulic press filter, which reduces the concentrate to 15% moisture. The dewatered concentrate is subsequently conveyed to a storage building, from where it is loaded into trucks for transport to an Impala smelting facility. It is reported that the possibility exists to send concentrate slurry directly to the smelting operations, which requires a tanker type transport truck, as the smelter does have the ability to conduct dewatering.

Tailings Scavenger Plant (TSP)

The TSP receives live tailings from the concentrator plant and employs additional flotation cells to produce a low-grade concentrate. This is pumped to the final concentrate thickener. The TSP concentrate combines with the Concentrator final concentrate and is then filtered out and then trucked to Impala Smelter. The TSP plant produces ~1200 6E ounces monthly, of additional recovery.

Tertiary Milling Plant

To further improve recovery of both PGM's as well as recover chromite, which is also present in the TRP orebody, a Tertiary Milling Plant has been constructed. The Main Plant concentrator tails is pumped to the Tertiary Milling and chromite recovery plant.

The incoming tails are first processed through a set of cyclones, which are used to separate the fine and coarse material. The coarse material is rich in chromite. The coarse material from the cyclones is pumped to the "Spiral Concentration Circuit". This spiral plant is a highly specialised equipment with no moving parts, which uses gravity and centrifugal force to separate small particles of different sizes and densities. The circuit consists of Roughers, 1st stage cleaner, 2nd stage Cleaner, Re-cleaner, scavenger roughers, and scavenger cleaners. Additional spirals have been added to provide additional recovery.

Through the spiral circuit, the chromite is upgraded and recovered, with subsequent stacking for product load-out. The chromite is trucked to Maputo harbour. Currently, the production of chromite is reported at ~22,000tpm.

A portion of the stream (the rougher middlings) that is discarded by the spirals is high in silicate content and is also rich in PGMs. This stream is pumped to the tertiary mill, for subsequent grinding, resulting in additional size reduction of the materials. This slurry discharge from the mill is then pumped to the main plant flotation circuit, where the chemicals are added to recover the additional PGMs, upgrading the final concentrate grade.

Mine Infrastructure

The mine infrastructure presently consists of, inter alia, the following structures and infrastructure - Approved in the 2015 (GCS) EMP/EIA. Please refer to the drawings attached in APPENDIX D for the general layout plans of all three sections.

The mine is a fully operational mine with two declines and associated processing infrastructure.

- Storm water dams, Drying Beds, Settling Dams and a treatment facility;
- Dirty Water Handling Infrastructure – RWD, Cut off trenches;
- Overland ore conveyances;
- Waste material stockpiles;
- High mast lighting. 10-15 high mast lights at each new shaft, in high traffic and security critical areas;
- Ore silo to provide surge capacity for the overland conveyor system;
- Office blocks;
- Change houses – change facilities, ablution and storage lockers for 350 – 400 people at each shaft;
- Lamp and crush facility at each shaft;
- Roads network;
- Haul Roads;
- Bus stop and parking for personnel and visitors;
- Security and access control;
- Cable storage and salvage yard;
- Sewage (treatment plants included as vendor supplied units, sized according to personnel complement;
- Firefighting and prevention (fire hydrants and hose reels, electric and diesel pumps to operate the deluge systems in the main substations of both shafts);

- Storm Water Management (cut off drains and berms at the Main and North shafts);
- General stores at each shaft for rock drills, rotary equipment, batteries and gas cylinders;
- Explosive stores (a local explosives magazine to cater for daily usage, filled daily from the primary storage);
- Bulk fuel and lubricant storage (to receive store and dispense a week's consumption of each product);
- Miscellaneous facilities: portal rainwater sump and drain, dirty water sump and drain, covered walkways, brake test ramp, refuse disposal facilities, electrified fencing around the perimeter of the infrastructure;
- Processing plants (UG 2 and Merensky);
- ROM Circuits, Silo's and Stockpiles;
- Primary processing plant;
- Secondary processing plant;
- Underground infrastructure (refuge bays, workshops, offices and diesel and lubricant storage);
- Existing Tailings Storage and Waste Rock Facilities; and
- New Tailings Storage Facility and associated pipelines.

EXISTING AND PROPOSED ACTIVITIES

The proposed listed activities for which this application has bee be submitted, is for the extension of the existing underground mining area.

The existing activities include all the activities listed above, environmental authorisations are presented in Table 6. The current mining operations consist out of two underground section accessed by two declines shafts (Main and North). The mine has a processing plant and associated waste disposal and water management infrastructure. More detail will be available during the EIA phase as to the exact extent of the proposed extension of the underground areas.

5. Policy and Legislative Context

Table 7: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Constitution of South Africa, 1996 (Act No. 108 of 1996) [as amended] • *Section 24* *Environment: Everyone has the right-* *(a) to an environment that is not harmful to their health or well-being; and* *(b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that-* *i) prevent pollution and ecological degradation;* *ii) promote conservation; and* *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*	The proposed development has the potential to harm the environment and poses a risk to the health and wellbeing of people. The development however, also has the potential to secure sustainable development through reusing process products and thereby limiting the use of natural resources. The Applicant has the overall responsibility to ensure that the rights of people in terms of Section 24 of the Constitution is protected in terms of the proposed development activity
National Environmental Management Act (No. 107 of 1998) [as amended] • *Section 28 (1)* *Duty of Care and responsibilities to minimise and remediate environmental degradation.*	The Applicant is the developer and overall responsibility of the mine rests with him, especially in terms of liabilities associated with the operational phase.
EIA Regulations, 2014 (Government Notices 982 - 984) [as amended] *The proposed construction, operational and closure activities of the proposed development triggers the following listed activity that are listed in the EIA regulations for which a Scoping and Environmental Impact Assessment (EIA) process have to be conducted:* • *Activity 17:* *Any activity including the operation of that activity which requires a mining right as contemplated in Section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which and exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).*	The proposed development requires amendment of the mining right. Section 102 amendment of the EMP.
EIA Regulations, 2017 (Government Notices 982 - 984) *Chapter 6: Regulation 39 to 44: Public Participation;*	The EIA Regulations, 2014 [as amended] prescribes inter alia: the manner in which public participation needs to be conducted as well as the requirements of a scoping and environmental impact assessment process and

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Chapter 4: Application for Environmental Authorisation: *Part 3 Scoping and Environmental Impact Report (S&EIR)* *Appendix 2: Scoping Report* *Appendix 3: Environmental Impact Assessment Report* *Appendix 4: Environmental Management Programme* *Appendix 5: Closure Plan* *Appendix 6: Specialist Reports*	the content of a scoping report, environmental impact assessment report and environmental management programme. The content of specialist reports, closure plans and environmental audit reports are also provided.
Mineral and Petroleum Resources Development Act, 2002 (Act. 28 of 2002) [as amended]:	Sections 16 and 22. In terms of Section 102 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) an amendment of the mine works programme and Environmental Management Programme (EMPR) for an existing mining right will be applied for.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended] • *Section 16* *General duty in respect of waste management;* • *Section 17;* *Reduction, re-use, recycling and recovery of waste;* • *Section 18; and* *Extended producer responsibility; and* • *Section 21* *General requirements for storage of hazardous and general waste.*	The expansion of the underground mining area will produce general and hazardous waste which need to be managed and disposed of according to best practices such as recycling, safe storage, etc. Disposal will take place on the existing approved waste disposal facilities (WRD and TSF) of the mine.
National Water Act, 1998 (Act No. 36 of 1998) [as amended] • *Section 3* *Regulation of flow and control of all water* • *Section 19* *Prevention of pollution to watercourses* • *Section 21* *The water use activities associated with the proposed development requires compliance with the requirements of the NWA as listed under GN No. 19182. An application for an integrated water use license is lodged in terms of Section 21 of the National Water Act, 1998 (Act 36 of 1998) [as amended] to undertake the following activity:* *Section 21: (g) disposing of waste in a manner which may detrimentally impact on a water resource.* *Section 21(j); Removing, discharge or disposing of water found underground if it is necessary for the*	The mine has an existing Water Use License (Licence No: 06/B41H/AJIGC/6098) for the following Section 21 water uses: - Section 21(a): Talking of water from a water resource - Section 21(b): Storage of water - Section 21(c): Impeding or diverting the flow of water in a watercourse - Section 21(e): Engaging in a controlled activity - Section 21(g): Disposing of water in a manner which may detrimentally impact on a water resource. - Section 21(i): Altering the bed, banks, course or characteristics of a watercourse.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
efficient continuation of an activity or for the safety of people	- Section 21(j): Removing, discharging or disposing of water found underground. The removing, discharging or disposal of water found underground from the proposed extension is authorised in the approved WUL. No additional water management infrastructure is required for the proposed extension. Water management on the mine to be in line with the requirements of the site specific WUL and GN R704 National Water Act, 1998 (Act No. 36 of 1998)
Mine Health and Safety Act, 1996 (Act No. 29 of 1996) [as amended] and associated regulations • *Chapter 2, Sections 2 – 4* *Responsibilities of owner* • *Chapter 2, Sections 5 – 13* *Responsibilities of manager;* • *Chapter 2, Sections 14 – 18;* *Documentation requirements;* • *Chapter 2, Section 19 – 20 and 22 to 24* *Employee's rights and duties; and* • *Chapter 2, Section 21* *Manufacturer's and supplier's duty for health and safety*.	The development activities will create an environment that is not safe and healthy for workers on and visitors to the site. The act provides for measures to prevent threats to the health and safety of humans in the development area.
National Heritage Resources Act, 1999 (Act No. 25 of 1999) • *Section 44 (1);* *Preservation and protection of heritage resources;* • *Section 3 Types and ranges of heritage resources (i) (i);* *Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens*.	Protection of indigenous heritage resources on the property. As the mine is an existing underground mine and the underground sections will only be expanded, it is anticipated that no new surface area will be disturbed.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) [as amended] • *Section 32* *Control of dust* • *Section 34* *Control of noise*	Impacts on surrounding landowners need to be managed through dust and noise mitigation measures.
National Dust Control Regulations, 2013 (Government Notice 827 of 2013) • *Section 3* *Dust fall standard*	Dust fall out need to be monitored in accordance to the standards set out in the monitoring programme with the specified measures due to the Applicant being liable to offences and penalties associated

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
• *Section 4* *Dust fall monitoring program* • *Section 6* *Measures for control of dust* • *Section 7* *Ambient air quality monitoring (PM10)* • *Section 8* *Offences* • *Section 9* *Penalties*	with non-conformance to dust which may influence employees and surrounding landowners.
Veld and Forest Fire Act, 1998 (Act No. 101 of 1998) [as amended] • *Section 12 (1)* *Duty of the landowner to prevent fire from spreading to neighbouring properties.*	Cautionary steps in avoiding the spread of fires to and from neighbouring properties.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) [as amended] • *Section 9* *Norms and standards* • *Section 27* *Delegation of power and duties* • *Section 30* *Financial accountability* • *Section 43* *Biodiversity management plans.*	Indigenous vegetation need to be protected and managed in accordance with management measures set out in the management plans developed for the mine and the Applicant need to ensure he is aware of and covers his liabilities.
Alien and Invasive Species Regulations (Government Notice 598 of 2014) and Alien and Invasive Species List, 2014 in terms of NEMBA (Government Notice 599 of 2014) • *Notice 2* *Exempted Alien Species in terms of Section 66 (1)* • *Notice 3* *National Lists of Invasive Species in terms of Section 70(1) – List 1, 3-9 & 11* • *Notice 4* *Prohibited Alien Species in terms of Section 67 (1) – List 1, 3-7, 9-10 & 12*	It is the responsibility of the Applicant to ensure that all prohibited plant and animal species are eradicated as far as possible.
Conservation of Agricultural Resources Act (no. 43 of 1983) • *Section 5*	Listed invader/alien plants occurring on site which requires management measures to be implemented to strive to maintain the status quo environment,

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Prohibition of spreading of weeds • *Section 12* *Maintenance of soil conservation works and maintenance of certain states of affairs* • *Section 16* *Regional Conservation Committees*	especially through the guidelines provided by the Regional Conservation Committee.
Hazardous Substances Act, 1973 (Act 15 of 1973) [as amended] • *Section 2* *Declaration of grouped hazardous substances;* • *Section 4* *Licensing;* • *Section 16* *Liability of employer or principle* • *Section 9 (1)* *Storage and handling of hazardous chemical substances* • *Section 18* *Offences*	The Applicant must ensure the safety of people working with hazardous chemicals (specifically fuels), as well as safe storage, use and disposal of containers during the on-site operational phase together with the associated liability should non-compliance be at the order of the day.
Hazardous Chemical Substances Regulations, 1995 (Government Notice 1179 of 1995) • *Section 4* *Duties of persons who may be exposed to hazardous chemical substances* • *Section 9A (1)* *Penalties*	Hazardous substances will be stored and utilised on the site and non-compliance to management measures will result in prosecution of the Applicant in terms of his liabilities to the socio-economic environment.
Waste Classification and Management Regulations and Norms and Standards for the assessment of for landfill disposal and for disposal of waste to landfill, 2013 (Government Notice 634 – 635 of 2013) promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [as amended]; and Regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation (GN R. 632 of 2015)	The expansion of the underground mining area will produce general and hazardous waste which need to be managed and disposed of according to best practices such as recycling, safe storage, etc. Disposal will take place on the existing approved waste disposal facilities (WRD and TSF) of the mine.
Guideline on the need and desirability in terms of the Impact Assessment (EIA) Regulations, 2010, Notice 891 of 2014	This guideline has been taken into account as part of project planning.
NEMA: Government Notice. 805 Companion Guideline on the Implantation of the Environmental Impact Assessment Regulations, 2010, October 2012.	The application for Environmental Authorisation is submitted in terms of the EIA Regulations.
NEMA: GN. 807 Public Participation Guideline, October 2012.	Consultation with Interested and Affected Parties and Communities.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Public Participation 2010, Integrated Environmental Management Guideline Series 7, DEA	This guideline has informed the public participation process for the project.
Regulations Pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, 2015 (Notice 1147 of 2015) • *Regulation 5: Scope of financial provision* • *Regulation 6: Method for determining financial provision* • *Regulation 12: Preparation and submission of plans and reports*	An applicant must determine the financial provision through a detailed itemisation of all activities and cost, calculated based on the actual cost of implementation of the measures required.
Regulations on use of Water for Mining and Related Activities Aimed at the Protection of Water Resources, 1999 (Notice 704 of 1999). • *Regulation 4: Restrictions on location of mining activities* • *Regulation 7: Protection of water resources* • *Regulation 12: Technical investigation and monitoring.*	Every person in control of a mine or activity must take measures to manage water in an effective manner as prescribe by the regulation.
NEM:AQA: GNR 283. National Atmospheric Emissions Reporting Regulations, 2015. *For purposes of these Regulations, emission sources and data providers are classified according to groups A to D listed in Annexure 1 to these Regulations.* Section 5(3): *For purposes of these Regulations, emission sources and data providers are classified according to groups A to D listed in Annexure 1 to these Regulations.*	Any person, that holds a mining right or permit in terms of the MPRDA. Emissions report must be made in the format required for NAEIS to the relevant air quality officer.
All other relevant national, provincial, district and local municipality legislation and guidelines that may be applicable to the application. Some of these are discussed in the next section but will be discussed in detail within the EIA / EMPR report.	

6. Need and desirability of the proposed activities

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Two Rivers Platinum (TRP) is establish mine with surface processing plants, waste storage facilities and two decline shafts (i.e. North and Main). The underground mining activities produce approximately 22 000 tons RoM monthly for the two sections. At the current mining rate the mine will run out of minable reserves in the near future. To ensure that the mine is kept operational, TRP has acquire the Tamboti mining and prospecting rights.

The mine has applied under section 11(1) of the MPRDA for the written consent of the Minster of Mineral Resources to transfer the extension area to TRP. The extension of the mining area will increase the life of mine to 25 years. The proposed extension of the underground mining area will enable Two River Platinum (Pty) Ltd to extend the life of mine (LOM) with a significant number of

years and therefore the benefits for South Africa as well as for the local communities as described above will also be extended.

The main benefits of the Two River Platinum mine are:

- Direct economic benefits will be derived from wages, taxes and profits. Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees;
- Extending the life of mine resulting in increased job security to employees.
- Implementation of the proposed project will result in skills development associated with the mining method;
- It contributes to the economic welfare of the surrounding community by creating working opportunities, in-house training to the regional population, creation of school and sport facilities, education and housing assistance and medical and clinical facilities;
- It contributes to the upliftment of living standards and the health and safety of the local community.
- The project will result in economic mining of a known resources as existing surface and underground infrastructure will be utilised.
- The net benefit to South Africa is a product produced for the world commodity market, earning South Africa the necessary foreign exchange and capital needed for a healthy economy and further capital investments in development projects for the long-term future of the country.

The project is aligned with the objectives of the MPRDA (Act 28 of 2002)

- To promote economic growth and mineral development in the Republic
- To promote employment and advance the social and economic welfare of all South Africans
- To ensure that the nation's mineral resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and
- To ensure that holders of mining rights contribute towards the social-economic development of the area in which they are operating

On the 20 October 2014, the Department of Environmental Affairs published a Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010, in Government Notice 891 of 2014. The key components are listed and discussed below:

- Securing ecological sustainable development and use of natural resources
- Promoting justifiable economic and social development.

Ecological sustainable developments and use of natural resources

The project area has been selected on the basis of the presence of economically mineable resources adjacent to the existing underground mining area. The underground mining areas will only be extended into the adjacent properties. The existing surface infrastructure (as described in this report) will be utilised for the processing of ore and disposal of waste. No surface infrastructure will be constructed. It is anticipated that no additional surface impact will take place. No additional impacts are anticipated on sensitive areas (i.e. aquatic ecosystems, biodiversity, heritage and social).

Some impacts on groundwater resources is anticipated and the impact will be further investigated in the EIA phase by the appointed relevant specialist. The results of these studies will be included in the EIA. Measures to mitigate the impacts to these resources will be included in the EIA.

Promoting justifiable economic and social development.

Community/society priorities are officially expressed through public documents including the provincial growth and development strategy and spatial development framework documents. The TRP project falls within the Greater Tubatse Municipality and forms part of the Greater Tubatse Municipality LED Strategy. Four programmes for economic development. This comprises (1) Sector Development, (2) Economic Infrastructure Support, (3) Social Development, and (4) Institutional/Governance Reform. The projects that have been identified in the LED are aimed at economic development by ensuring job opportunities are created, jobs security is created, skills development takes place and that opportunities are created for SMME development. Mining plays an important part in the sector development of the LED strategy. Mines contributes towards the socio-economic development of the region through social-upliftment and job creation as primary agents.

The proposed project will benefit society and the surrounding communities both directly and indirectly by providing job security at the proposed operation and through the extraction of mineral resources and beneficiation of mineral resources within Limpopo. Direct economic benefits will be derived from wages, taxes and profits. Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees. The proposed development will also ensure local economic development through the implementation of projects identified in the Social and Labour Plan. TRP is fully committed to implementing development plans and projects that will facilitate local community and rural development in the area surrounding its project in line with the provisions of the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry.

According to the Western Cape Department of Environmental Affairs and Development Planning's (WC DEADP) Guideline on Need and Desirability: EIA Guideline and Information Document Series (2011), to describe the need for a development, it must be determined whether it is the right time for

locating the type of land use and/or activity being proposed. To describe the desirability for a development, it must be determined, whether it is the right place for locating the type of land use and/or activity being proposed. Need and desirability can be equated to the concept of wise use of land which can be determined through asking the question: "what is the most sustainable use of land?" Considering the above, the need and desirability of an application must be addressed separately and in detail answering *inter alia* the following questions:

Table 8: Need and desirability considerations

<table>
<tr><th colspan="3">A) NEED (TIMING)</th></tr>
<tr><td colspan="2">QUESTION A1: Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority?</td><td rowspan="2">The project is aligned with the objectives of the municipal Spatial Development Framework (SDF) and Integrated Development Plan (IDP) and will not compromise the integrity of these respective forward planning documents.</td></tr>
<tr><td>YES X</td><td>NO</td></tr>
<tr><td colspan="2">QUESTION A2: Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?</td><td rowspan="2">The expansion of the underground mining area will increase the life of mine of the TRP mine.

The proposed activities will enable Two Rivers Platinum (Pty) Ltd to extend the life of mine (LOM) with a significant number of years and therefore the benefits for local communities and South Africa e.g. employment provision and social upliftment will continue for longer.</td></tr>
<tr><td>YES X</td><td>NO</td></tr>
<tr><td colspan="2">QUESTION A3: Does the community/area need the activity and the associated land use concerned (is it a societal priority)?</td><td rowspan="2">Considering the key sectors identified in Greater Tubatse Municipality LED Strategy advocates four programmes for economic development. This comprises (1) Sector Development, (2) Economic Infrastructure Support, (3) Social Development, and (4) Institutional/Governance Reform.

The projects that have been identified in the LED are aimed at economic development by ensuring job opportunities are created, jobs security is created, skills development takes place and that opportunities are created for SMME development.

Mining plays an important part in the sector development of the LED strategy. The mine also contributes towards the socio-economic development of the region through social-upliftment and job creation as primary agents.</td></tr>
<tr><td>YES X</td><td>NO</td></tr>
<tr><td colspan="2">QUESTION A4: Are the necessary services with the adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?</td><td rowspan="2">All infrastructure for services and capacity is sufficient for the existing and proposed extension of the underground mining area</td></tr>
<tr><td>YES</td><td>NO X</td></tr>
<tr><td colspan="2">QUESTION A5: Is this development provided for in the infrastructure planning of the municipality, and if not, what will the implication be on the</td><td>No municipal infrastructure will be required for the study area.</td></tr>
</table>

infrastructure planning of the municipality (priority and placement of services and opportunity costs)?		
YES	**NO X**	
QUESTION A6: Is this project part of a national programme to address an issue of national concern or importance?		N/A
YES	**NO X**	
B) DESIRABILITY (PLACING)		
QUESTION B1: Is the development the best practicable environmental option for this land/site?		The study area has been transformed. Through implementing good practice environmental management measures and mitigation measures, it will ensure that both human and environment are not negatively affected by the development. The extension of the underground area will take place from the existing underground mining area and no surface infrastructure will be constructed.
YES X	**NO**	
QUESTION B2: Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities?		The project is aligned with the objectives of the municipal Spatial Development Framework (SDF) and Integrated Development Plan (IDP) and will not compromise the integrity of these respective forward planning documents.
YES	**NO X**	
QUESTION B3: Would the approval of this application compromise the integrity of the existing environmental management priorities of the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?		The BGIS (2007) assessment indicates that approximately 85.2% of the municipality are currently considered untransformed. This figure is however regarded an overestimation of the true extent of remaining natural (pristine) habitat. The study site corresponds to the Savanna Biome as defined by Mucina & Rutherford (VegMap, 2006) with the Sekhukhune Mountain Bushveld ecological type spatially represented within the study site.
YES	**NO X**	The existing mining and associated activities has contributed to the transformation of the natural habitat. However, the proposed extension of the will not have a direct impact on the transformation of natural habitat. The secondary impacts associated with the dumping of waste rock and slimes will be assessed in detail during the EIA phase of the application, where detailed prevention and mitigation measures will be recommended. It should be noted that the processing of ROM, disposal of waste rock and slime will take place as per current operations

QUESTION B4: Do location factors favour this land use (associated with the activity applied for) at this place, etc.)?		No location alternatives for the proposed extension is applicable. The proposed underground extension is adjacent to the existing underground areas. The current mining operation accessed by two existing decline shafts (i.e. North and Main) will be utilised to access the proposed area. The proposed localities of the proposed extension also means that existing facilities (i.e. Shaft, processing plant, disposal facilities) can be utilised and thus minimising the impact.
YES X	**NO**	
QUESTION B5: Will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?		The proposed extension will only be of the underground mining sections. The proposed extension section will be access via the existing decline shafts and the processing of ROM, disposal of waste rock and slime will take place as per current operations Therefore, the only significant impact of the activities expected, is an increase in air, noise and visual pollution and possibly water pollution if not managed effectively.
YES	**NO X**	
QUESTION B6: Will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?		Noise, dust and visual pollution can slightly increase if managed incorrectly. Possibly water pollution, if impacts are not managed effectively, but with the proper mitigation and good practice environmental management measures, it will result in minimal impacts. These impacts will be assessed in detail during the EIA phase of the application, where detailed prevention and mitigation measures will be recommended.
YES X	**NO**	
QUESTION B7: Will the proposed land use result in unacceptable cumulative impacts?		As already mentioned, through the implementation of good practice environmental management measures as well as mitigation measures, all direct and cumulative impacts which may result from the proposed development will be addressed and ensure that the environment is affected to the minimum. The potential cumulative impacts will be assessed in detail during the EIA phase of the application, where detailed prevention and mitigation measures will be recommended.

7. Period for which the environmental authorisation is required

The authorisation for the waste management facilities is required for a period of 25 years.

8. Description of the process followed to reach the proposed preferred site

(NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result)

i) Details of all alternatives considered

(With reference to the site plan provided as Appendix D).

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity)

According to the Western Cape Department of Environmental Affairs & Development Planning (WC DEADP) Guideline on alternatives: EIA Guideline and Information Document Series (2011) feasible and reasonable alternatives must be identified for a development as required by the NEMA EIA Regulations and applicable to EIA. Each alternative is to be accompanied by a description and comparative assessment of the advantages and disadvantages that such development and activities will pose on the environment and socio-economy. Alternatives form a vital part of the initial assessment process through the consideration of modifications to prevent and/or mitigate environmental impacts associated with a particular development. Alternatives are to be amended when the development's scope of work is amended. It is vital that original as well as amended alternative identification, investigation and assessment together with the generation and consideration of modifications and changes to the development and activities are documented.

Although an array of alternatives could be investigated for each project, such alternatives will not necessarily be applicable to each project and/or project phase. However, there must always be strived to seek alternatives that maximises efficient and sustainable resource utilisation and minimise any negative impacts on the bio-physical and socio-economic environments.

Feasible alternatives

The following alternatives were investigated as feasible alternatives:

- *The site on which the proposed underground mining sections are to be located (site and layout alternatives);*
- *The mining method (technology alternatives)*
- *Design alternatives; and*
- Not implementing the mining activities (*No – Go alternative*).

Table 9 below contains the analysis of alternatives identified.

Table 9: Alternatives Analysis

TYPE OF ALTERNATIVE:	ALTERNATIVE EXPLANATION:
Location	**Develop on an alternative property** **Develop on alternative sites on the same property/properties**
No location alternatives have been identified or are assessed as part of this application, since the proposed alternative is located within the existing mining area. No site alternatives for the extension of underground mining area are applicable as the portions onto which the underground sections will be extended to, is immediately adjacent to the existing underground workings. The localities of the proposed development also mean that the existing infrastructure of the mine can be utilised for the processing and disposal of waste as per current operations	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Activity	**Develop an alternative activity e.g. Incineration of waste vs. landfill disposal, abstraction of water vs. re-use/recycling of water.**
No activity alternatives have been identified or are assessed as part of this application.	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Design	**Adapt architectural and/or engineering designs.**
No design or engineering alternatives have been identified or are assessed as part of this application. No mining method alternatives have been assessed as the current mining methods will be utilised.	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Layout	**Adapt spatial configurations of an activity on any site e.g. Locate manure dams away from water resources.**
No Layout alternatives have been assessed	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Technological	**Adapt methods or processes that can be implemented to achieve the same goal e.g. Introduction of bacteria rather than chemicals to waste water.**
No method or process alternative have been assessed. The current mining methods will be utilised.	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Demand	**The demand for products and/or services can be met by other means e.g. The demand for paper can be met through deforestation or rather by efficient and viable recycling.**
No alternatives to meet demand were identified or are assessed in this application.	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Input	**Implement different input materials and/or sources e.g. Utilisation of woodchips for fuelling boilers rather than electricity.**
No input alternatives were identified or are assessed in this application.	

TYPE OF ALTERNATIVE:	ALTERNATIVE EXPLANATION:
Routing	**Implement alternative routes for linear developments such as power line servitudes, transportation and pipeline routes e.g. Elongate and divert a railway line to exclude a sensitive environment.**
N/A	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Transport	**Method of transportation of product or ore.**
No alternatives have been assessed. The current mining methods will be utilised, and transport will be by the current mining and processing infrastructure.	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Scheduling and Timing	**Adapt the order and/or scheduling of several measures which plays a part in a program as it will influence the overall effectiveness of the end result.**
No alternative scheduling has been investigated. Scheduling will be based on the mine planning	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Scale	**Adapt the scale of an activity ex. 15 vs. 35 housing units, 12m2 vs. 0.5km2.** **P.S. Scale and magnitude is interrelated.**
At this stage, no alternatives in terms of scale have been identified or are assessed.	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
Magnitude	**Adapt the magnitude which is directly related to the extent of an activity.** **P.S. Scale and magnitude is interrelated. An activity may be very small scale but can pose an extensive magnitude ex. Destroying an extremely sensitive wetland on a very small scale could result in a magnitude of such as destroying the whole wetland and/or ecological system.**
At this stage, no alternatives in terms of magnitude have been identified or are assessed.	
TYPE OF ALTERNATIVE:	**ALTERNATIVE EXPLANATION:**
No-Go	**The option of not undertaking and implementing the activity at all.**
The length of time that the local, regional and national socio-economic environment will benefit from the mining activities will decrease by a significant number of years, should the proposed activities not be implemented.	

ii) Details of the Public Participation Process Followed

(Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether they attended public meetings. (Information to be provided to affected parties must include

sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land)

Public Participation

This section describes the public participation process (PPP) undertaken to date in line with Chapter 6 of the EIA Regulations (2014). The process is undertaken to ensure compliance with the requirements in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [as amended] (MPRDA) and the Environmental Impact Assessment Regulations (2014) [as amended]. The intention of the PPP was to inform I&APs, in sufficient detail, of the proposed project in order that I&APs may contribute meaningfully to the EIA process.

The PPP to date has included notification of I&APs through distribution of a Background Information Document (BID), placement of newspaper advertisements, placement of site, focussed engagement and meetings with community structures and public scoping meetings. A key aspect of public consultation is the notification of landowners, occupier and users within and adjacent to the application area. More detail in this regard to the process followed is provided below.

Interested and affected party (I&AP) database

As part of the PPP an I&AP database has been developed for the project. I&APs identified for the project include:

- landowners, lawful occupiers and ward councillors within and adjacent to the mining right application area
- community leaders and community structures
- non-government organisations and associations working in the area
- mines, industry and businesses in the area
- Parastatals
- commenting authorities:
    - Limpopo Department of Agriculture and Rural Development (LDARD)
    - Department of Water and Sanitation (DWS)
    - Department of Agriculture, Forestry and Fisheries (DAFF)
    - Department of Rural Development and Land Reform (DRDLR): Land Claims Commissioner
    - South Africa Heritage Resource Agency (SAHRA)
    - Provincial Heritage Resources Authority Gauteng (PHRAG)
    - Department of Economic Development, Environment and Tourism
    - Greater Tubatse Municipality

I&APs who attended meetings and /or submitted contact details have been registered on the I&AP database. The latest copy of the database is included in Appendix F-i. The database will be updated on an on-going basis throughout the process.

Mining Right Application

- A copy of the scoping report has been made available for a 30-day review and comment period, as from 18 July to 18 August 2018.
- An electronic copy of the scoping can be downloaded. Please contact Malan Scholes Consulting (projects@malanscholesconsulting.co.za) for link.
- Please send all comments to projects@malanscholesconsulting.co.za

Registration of any I&AP's can take place by registering on the I&AP's database, by sending details of the I&AP to MSC. Please feel welcome to contact us should you have further queries or would need additional clarification.

Advertisements and site notices

During the initiation of the PPP, advertisements were placed in the following newspaper:

- Steelburger on Friday 9 March 2018 (local newspaper)

A copy advertisements placed are included in Appendix F-ii.

Site notices (5) in English, were placed at key positions in and adjacent to the mining right area on 8 March 2018. A copy of the site notices are presented in Appendix F-iii with the location of the notices presented in Appendix F-iv.

Additional Advertisements and site Notices.

Announcement of the public review period will be done through the following advertisement and placement of site notices.

- Steelburger on Friday 20 July 2018 (local newspaper)

Site Notices will be placed at key positions in and adjacent to the mining right area on 16 an 17 July 2018. Copy of the advertisement, site notice and placements of site notices will be included into the Final Scoping Report for submission to the DMR.

Background Information Document (BID)

A BID document was compiled for the proposed project. The purpose of the BID was to inform I&APs about the proposed project, the EIA process, environmental attributes, possible impacts and means of providing input into the EIA process. The BID was made available in English and included details of the public scoping meetings. The BID was distributed at the public scoping meetings. The BID is presented in Appendix F-v.

Public Meetings

The purpose of holding the public scoping meetings was to:

- to provide an overview of the project and related EIA process
- to provide I&APs with an opportunity to: o raise any issues and concerns (both positive or negative)
    - provide input on any environmental sensitivities and potential impacts
    - to record issues within the formal assessment process so that they can be addressed during the course of the EIA
- to outline the way forward.

The date, venue and time of the public scoping meetings are provided below.

Table 10: Scoping Public Meeting

Date	Venue	Time
Friday 23 March 2018	Ga-Malekana Community Hall	16h00 – 17h30

The meetings were held in English due to the diversity of languages present at the meetings with translation taking place where required. Copies of the BID were made available to attendees at the meetings. Minutes of the meeting is included in Appendix F-vi.

Community Leaders Meeting

A meeting with community leaders, Royal houses and community representatives were arranged as provided below.

Table 11: Community Leaders Meeting

Date	Venue	Time
Thursday 24 May 2018	Chrome Valley Lodge	10h00 – 12h00

The proposed project was presented to the community leaders and to obtain permission from the community leaders to arrange community public meetings. Minutes of the meeting is included in Appendix F-vii.

Community Scoping Meetings

Additional public meetings were arranged through the community structures (i.e. Community Leaders) with the Kalkfontein community and the Buffelshoek community as presented below.

Table 12: Additional Scoping Meetings

Date	Venue	Time
Thursday 7 June 2018	Kalkfontein Community Hall	10h00 – 12h00
Thursday 7 June 2018	Buffelshoek Community Hall	13h00 – 15h00

The meetings were presented in English due to the diversity of languages present at the meetings with translation taking place where required. Copies of the BID were made available to attendees at the meetings. Minutes of the meeting is included in Appendix F-viii. Proof of arrangement through the community structures are presented in Appendix F-ix.

Review of the Draft Basic Assessment

I&AP review of Scoping Report

The Scoping Report is herewith released for a period of 30 days from 18 July 2018 to 18 August 2018. Hard copies of the Scoping Report is herewith submitted to all organs of state and relevant authorities. In addition copies are placed at the following locations as presented below:

Table 13: Scoping Report for Public Review

Venue	Location
Twee Rivers Mine	SHEQ Offices
Kalfontein Tribal Office	Tribal Office
Buffelshoek Tribal Office	Tribal Office
Malan Scholes Consulting Office	Reception First Floor, One-On-Jameson, 1 Jameson Avenue, Melrose Estate, Johannesburg

In addition, registered I&APs have been notified of the availability of the Scoping Report for review via SMS and E-mail notifications. Electronic copies of the Scoping Report will be made available on request. Where meetings take place during the review period, hard copies of the executive summary will be provided.

Next Phase - Way forward

All comments received from I&APs and organs of state and responses sent will be included in the final Scoping Report to be submitted to the Competent Authority (CA).

DMR review of scoping report

On completion of the 30-day review period, a Final Scoping Report will be compiled which will include comments received during the I&AP review period. The report will be submitted to the DMR for its review via the online SAMRAD system.

Summary of Issues raised

A high level summary of the issues/concerns raised during the public meetings are presented below.

- Impact on groundwater and surface water
- Impact on biodiversity
- Jobs creation
    - Benefit to the community, Skills development
- Damage to Houses – Cracks
- Employment and the number of employees (Empowerment).

iii) Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

Comments received are listed below, comments received during the public review period will be discussed in this section when the scoping report is submitted to the Competent Authority.

Table 14: Summary of issues raised

Name and Surname	Issues raised	Response provided by project team
Mr Masha	Asked which portion to be affected and further asked that community must be engaged. He also asked how TRP is going to address the environmental impact and put measures in place. He said that fauna and flora will be affected also due to water shortages	The EAP responded on the issues raised: 1. A map was presented to indicated which portion will be included into the mining right. 2. Impacts identified during the scoping phase will be address during the EIA phase of the project. Mitigation measures will be included in EMP. 3. Additional community meeting will be arranged through the community leaders and Royal houses.
Mr Maimela	Emphasizes was placed on the fact that some of the wells had water before but now is dry and request for transparency about information.	The EAP responded on the issues raised: 1. The impact of the mine on the groundwater resource will be investigated during the EIA phase 2. The Draft Scoping and Draft EIA will be made available for public review.

Mr Tau	He asked whether the tailings dam will be constructed at Kalkfontein	Mr Dzondzi responded that TRP already secured an area for new Tailings dam at De Groote boom and environmental authorization has been obtained for the project.
Mr Tau	Tau mentioned that houses will be affected by blasting during mining.	Mr Jacobs responded that a complaint was received that the blast has causes damage to the houses. An external independent company was appointed by the mine to do samples and investigation, the report is available on request. The report concluded that TRP blasting did not cause the damage to the properties.
Mr Tau	Asked if the community can get mining rights for surface while TRP is mining underground in the same area.	No opencast reserves are available within the area. Explanation was given on how deep the reef is and that it cannot be open casted mined (JJ)
Mr Tau	Water crisis should be addressed since dams and wells are dry.	Groundwater impact assessment will be included in the EIA phase of the project (DW). Mr Bethrum Dzondzi added the water the water shortage can be reviewed on the Social and Labour Plan. He emphasize that there are measures of addressing water issues sometimes it can be due to seasons and request the members that for now we must focus on the Project itself. He will facilitate the process of checking water quality and quantity.
Mr Maimela	He requested that dust monitoring results should be shared since it affect them too. He further proposed regular information sharing or forum sessions.	All information is available at the mine on request. The mine has platforms and forums in place where information can be presented.

Community Member Buffelshoek (CMB)	Question was raised regarding the farm boundaries and the mining area. The schedule only presents a 5 year plan. The life of mine is presented as 25 years.	The life of mine is 25 year based on current resources. The planning is only undertaken for 5 years and will be updated annually (RM). The farm boundaries and mining area is presented in the BID (RM).
CMB	What will the extent of mining be in Buffelshoek?	No mining is taking place at Buffelshoek, but in future mining may take place. Additional exploration will be required to establish the reserve (BD)
CMB	Will the Scoping Report be made available for public review?	I&AP's will have 30 days for review of the documents for the date it is made available for public review. This will be done during the scoping and EIA phase of the project (RM). All registered I&AP's will be informed when the documents are made available.
CMB	Concern regarding the first arranged scoping meeting of 23 March was raised.	During the first scoping meeting held on 23 March 2018 the community raised the concern that not all communities affected was included. For this reason additional scoping meeting with community leaders and the communities were arranged (RM). All scoping meeting will be reflected in the Draft Scoping Report.
CMB	Will chrome and PGM's be mined and where will processing take place?	Chrome and PGM's will be mined within the mining right area. Processing will take place at the current processing plant. No new surface infrastructure forms part of the application (RM).
CMB	Will the community benefit from the chrome mining? Will the community obtain 26% shareholding?	The shareholding concern does not form part of the scope of the current application and process. ARM legal has met with the community leaders and legal representation and the concerns will be addressed on another platform by ARM Legal (BD).

CMB	The legal representative of the community to be included in the consultation process and future meetings.	The comments is noted and the legal representative will be included in the process (RM).
CMB	Employment and SME opportunities for the community	Employment and SME's will be address by the mine through the SLP (BD).
CMB	Concern was raised regarding Groundwater and that the mine will have an impact on the groundwater quality and quantity.	Groundwater will be addressed by a groundwater specialist study and will form part of the EIA phase.
CMB	How will the project affect the following; - Blasting - Grazing - Groundwater	No surface infrastructure will be constructed and the mine is well below surface level and it is anticipated that the mine will not have additional surface impacts. Groundwater will be addressed by a specialist study during the EIA phase.
CMB	No surface infrastructure will be constructed. Will any additional employment opportunities created	Employment will be address by the mine through the SLP (BD).
Community Leader	Senior leaders/Legal team to be present at the next meeting.	Noted.

9. The Environmental attributes associated with the sites

(1) Baseline Environment

The study area falls within the Tubatse Local Municipality and the Sekhukhune District Municipality, Limpopo Province.

The proposed extension of the underground mining area will be located on various portions of farms Tweefontein 360KT, Dwarsrivier 372 KT, Kalkfontein 367 KT and Buffelshoek 368 KT, Steelpoort, Limpopo Province.

Type of environment affected by the proposed activity.

(Its current geographical, physical, biological, socio- economic, and cultural character)

Gradient and landscape context

The project area is located on the gently undulating plains of the Steelpoort River valley. The valley features a strip of plains on either side of the river and the plains are flanked by a series of hills, which are the foothills of the eastern escarpment of southern Africa.

The surrounding area comprises of undulating, mountainous terrain, where elevations range from 1 900 mamsl in the Schurinksberg range in the east to 800-1 000 mamsl in the Steelpoort, Dwarsrivier and Klein-Dwarsrivier river valleys. The elevation rises steeply to 1 600m to the west and south west of the Dwarsrivier valley, on the western periphery of the Dwarsrivier farm. Major topographical features include the Dwarsriver and Klein Dwarsrivier river systems and steep slopes forming part of the Merensky and UG2 outcrops.

Regional Geology

The bassline information in this section of the report is extracted from the approved GCS, EMP/EIA (approved 30 July 2015).

The proposed UG2 and Merensky expansion project areas, are situated in the eastern limb of the Bushveld Igneous Complex, mainly anorthosite and norite with thin localized layers of chromite and pyroxenite, the world's largest layered intrusion, comprising the emplacement of at least 7 105km³ of magma into the sediments of the Transvaal Supergroup. The UG2 sub-outcrops approximately north/south along the Klein Dwarsrivier valley and dips towards the west at 7-10º. Faults with dolerite intrusive dykes dominate the structural setting creating steeply incised valleys.

Two (2) dyke sets are evident. The most prominent set strikes NNE-SSW comprises a series of relatively closely spaced dyke intrusions. The second set strikes WNW ESE and is widely spaced. The dolerite dykes are fine to medium grained with an average thickness of less than 10m.

The faults striking NNE-SSW on TRP property are predominantly strike-slip in character. In contrast, the ENE-WSW and NNW-SSE fault sets show little or no strike-slip movement. Mining exploration observations have been made of the intersections between dykes and faults and the age relationships is reported to be complicated, with the majority of the more prominent NNE-aligned faults appearing to post-date the dykes.

Climate

Regional Climate

The project area is situated on the eastern escarpment on the border of the Highveld and Northern Transvaal climatic zones (Schulze, 1974) and falls within the Northern Transvaal Climate Zone, as defined by Schulze (1994). The climate is semi-arid and hot with rainfall occurring as a result of thunderstorms. The rainy season extends from November to March, with the peak rainfall occurring in January. Rainfall is somewhat variable with 12% of all years, experiencing drought conditions. The mean annual rainfall is in the order of 703mm. Frost is rare and generally only occurs from July to August.

Average daily maximum temperatures are approximately 32 ºC in January, and 22 ºC in July, with extremes in the order of 42 ºC and 31 ºC respectively. Average daily minimum temperatures are approximately 18 ºC in January and 4 ºC in July, with extremes of the order of 8 ºC and -7 ºC respectively.

Prevailing Wind Direction

The local wind field is characterised by south-easterly and north-easterly winds with a very low frequency of winds from the western sector (due to the mountainous terrain to the west). The north-easterly wind flow increases during day-time conditions with south-easterly wind flow increasing during the night. Low to moderate wind speeds with an average wind speed of 3.3m/s. Local source contributors to ambient PM_{10} concentrations in the vicinity of the study site are: domestic fuel burning and vehicle activity in residential areas close to the mine; surrounding chrome and platinum mining activities; cattle ranching in the Steelpoort Valley; agricultural activities and limited cultivation in fertile areas adjacent to the Steelpoort River.

Soils, Land Use and Land Capacity

Existing Mine (and Location of the UG2 and Merensky Expansion)

Specialist studies were undertaken in 2001 – 2002 and again from the first expansion project in 2013, the following information was extracted from the EMP/EIA (GCS, 2015):

In the initial infield studies in 2001-2002 a total of thirteen (13) soil forms were identified in the study area (existing mine infrastructure) including: Hutton (Hu), Avalon (Av), Westleigh (We), Valsrivier (Va), Swartland (Sw), Sterkspruit (Ss), Sepane (Se), Bonheim (Bo), Glenrosa (Gs), Mayo (My), Mispah (Ms), Oakleaf (Oa) and Willowbrook (Wo).

In the study carried out in August 2002 on the Northern Decline Area, a total of four (4) soil forms were identified in the study area including: Hutton (Hu), Valsrivier (Va), Glenrosa (Gs) and Mispah (Ms). The soil forms Oakleaf, Valsrivier and Mispah dominate the existing mine infrastructure areas.

For the expansion of the TSF a specialist study was undertaken by TerraAfrica in 2013. For the investigation three different main soil groups were identified i.e. soil of the Mispah, Oudtshoorn and Rensburg soil forms. The site is dominated by very shallow rocky soils of the Mispah form (47.5% or 75.5 ha of the total study area) as well as soil with a dorbank horizon of the Oudtshoorn form (76.7 ha or 48.3%). The other soil form identified is that of the Rensburg form that consist of a vertical A-horizon overlying a G-horizon.

Soil was chemically analysed at a soil laboratory and was found to range from slightly acidic to mildly alkaline. High levels of calcium and magnesium were tested. Two main land capability classes namely grazing, and wilderness capability were identified for the footprint site and pipeline route. Grazing land capability included all the soil forms except soils from the Mispah soil form. The area has very low potential for irrigated and rainfed crop production due to the soil properties. The area has an average grazing capacity of 6-8 ha per large animal unit and the entire study area can carry approximately 20 head of cattle without resulting in veld degradation.

Groundwater (Hydrogeology)

The baseline information for this section is extracted from the hydrogeological study report, compiled by GCS in 2012 (GCS, EMP/EIA 2015).

Groundwater in the current and proposed expansion areas (Kalkfontein and Tweefontein farms, the north of Dwarsrivier) is controlled by shallow weathered and deep fractured aquifers. Some alluvium primary aquifers are associated with the floodplain of the Dwars River, but this does not play a role

for the underground mining. The groundwater occurrence in the deep aquifer is controlled by the lateral and vertical distribution of fracture zones.

A hydrocensus as conducted in August 2012 within the Kalkfontein and Tweefontein properties, as well as neighbouring farms within a maximum radius of 2 km from prospective mine infrastructure indicated that: A total of three (3) boreholes and one (1) fountain were visited during the hydrocensus. One (1) borehole was equipped with a submersible pump powered by a generator and the remaining two (2) boreholes were not equipped nor in use.

The water from the fountain is directed via a pipeline toward water troughs for stock watering, while the water from the borehole is used for domestic and small scale irrigational purposes. Residents in the Kalkfontein area mostly buy water or collect the water from the Dwars River that flows past the site area at approximately 6km to the west.

According to available data from the NGDB as well as the hydrocensus, the water levels in boreholes surrounding the site area vary from ~3.0 to ~60 metres below ground level (mbgl).

A total of four (4) new boreholes were drilled with borehole depths ranging between 40m and 80m. Very low yields were obtained on all the boreholes except one, which intersected an underground cavity and are not regarded as representative of the ambient hydrogeology that will control the inflow into the proposed new mine workings.

The boreholes were pumped at abstraction rates that ranged between 1.21 to 1.45 l/s. Time periods for the constant rate tests ranged between 9 to 480 minutes. The aquifer test data was interpreted using the Cooper-Jacob (1946) method for drawdown data, and the residual drawdown method for the recovery data. Very low transmissivities were obtained, with no significant water strikes related to the lineaments shown on the geological maps.

A total of four (4) groundwater samples were collected during the pumping tests on the newly drilled boreholes and were sent to Analytico (an accredited laboratory) for analyses. The chemistry data was compared to the Department of Water Affairs South Africa Water Quality Target Values (DWA SAWQTV) for drinking water, as well as the South Africa National Standard (SANS241:2011) guidelines for domestic use.

The following observations were made from the results:

- All boreholes showed compliance with the (SANS241:2011) standard for drinking water for all constituents;

- All boreholes exceeded the target values for drinking water but remained compliant with the SANS241:2011 standard for drinking water for the electric conductivity (EC) and calcium (Ca);
- Only TRP GWM16 were compliant with the target values for magnesium (Mg); and
- TRP GWM16 and TRP GWM17 exceeded the target values for total dissolved solids (TDS).

Surface Water (Hydrology)

The baseline information for this section is extracted from the hydrological assessment, compiled by GCS in 2012 (GCS, EMP/EIA 2015).

Water Management Area

TRP is located within the B41G quaternary catchment of the Olifants Water Management Area (WMA), also referred to as WMA 4. The Olifants River originates near Bethal in the Highveld of Mpumalanga, initially flowing northwards before curving eastwards and reaching Mozambique via the Kruger National Park. In Mozambique, the Olifants River joins the Limpopo River before discharging into the Indian Ocean.

The main tributaries of this WMA are the Wilge, Elands and Ga-Selati Rivers on the left bank, and the Steelpoort, Blyde and Klaserie Rivers.

Baseline hydrological

The project area consists of a main catchment within which a relevant sub-catchment was delineated. The catchment is mainly rural. In order to calculate the peak flows, the Rational, Alternative Rational, Standard Design Flood and an Empirical Method were utilised. The flows were calculated under current conditions (natural and current mining activities) and were determined for a 24-hour rainfall event. The area is not anticipated to have a large potential stream flow reduction impact on the runoff of the immediate and general area. The results of the SDF method were chosen as the best of those calculated. For the larger of the two catchments analysed, the 1 in 100-year peak flow, using this method, was 2155.1m3/s and the 1 in 50-year peak flow was 1693.8m3/s. For the smaller catchment the results were 67.9m3/s and 53.3m3/s, respectively.

A water quality evaluation was performed on a sampling point in the site area. The water sample indicated relatively good quality water in terms of compliance to the SAWQG and SANS standards. The sample had elevated metals (iron and aluminium), which could have resulted from natural water-rock interactions. These will not have an adverse effect on health. The water quality results did not show an impact from mining on the streams. Floodlines on river sections were analysed to evaluate

risks associated with potential flooding of infrastructure and protection of natural resources. The floodline analysis showed that the relevant floodlines fall largely but not exclusively within 100m of the rivers analysed.

Wetland and Riparian Zones

The existing EMP/EIA (GCS 2015) states that small pockets of wetland vegetation exist on the property, but this is only associated with the major rivers that run through the site (Groot and Klein Dwars Rivers). Wetlands do not exist in isolation on any other area of the property.

FLORA (Plant Life)

The following baseline information for the existing mining area was extracted from the EMP/EIA (GCS 2015) South Africa National Standard (SANS241:2011)

The Dwars River area comprises two vegetation types, namely Sekhukhune Plains Bushveld and Sekhukhune Mountain Bushveld (Mucina & Rutherford, 2006). Sekhukhune Plains Bushveld is confined to the level plains of major river valleys in northern Mpumalanga and southern Limpopo Provinces. It has a conservation status of Vulnerable and is considered poorly protected. Almost 50% of the project area is covered by transformed and untransformed portions of Sekhukhune Pains Bushveld. Sekhukhune Mountain Bushveld dominates the mountainous western half of the project area.

This vegetation type is also confined to northern Mpumalanga and southern Limpopo provinces, and has a conservation status of Least Threatened. However, it is hardly protected and Mucina and Rutherford (2006) comment that the area within the vicinity of the Dwars River is under increasing pressure from mining activities. The project area is situated within the Sekhukhuneland Centre of Plant Endemism (SCPE), an area characterised by a high proportion of range-restricted endemic plants, many of which are threatened (Van Wyk & Smith, 2001).

Fourteen vegetation communities are within the project area based on distinctive plant structure and floristic composition, as follows:

- Kirkia – Triaspis Closed Woodland
- Lydenburgia – Vitex Open Woodland
- Protea – Tristachya Open Woodland
- Lydenburgia – Olea Outcrop Thicket
- Xerophyta - Myrothamnus Sheetrock Shrubland
- Acacia Closed Woodland

- Sclerocarya - Bolusanthus Open Woodland
- Euclea - Rhus Open Shrubland
- Lydenburgia - Euclea Open Woodland
- Plains Thicket
- Degraded Old Lands
- Lydenburgia - Olea Riverine Thicket
- Combretum erythrophyllum Riverine Woodland
- Phragmites - Imperata Marsh

Important Flora

Fifteen Red Data plants has been identified in the existing mining area. Three of these are significantly threatened and are in urgent need of conservation attention:

Gladiolus sp. nov. – This spectacular iris has only recently been discovered in the Kennedy's Vale area by Graham Deall in 2005. It has subsequently also been located at TRP near the North Decline (M. Lötter pers. comm.). The species is currently being described by Dr John Manning of the South African National Biodiversity Institute and is confirmed as a very range-restricted endemic of the SCPE. Mervyn Lötter of the MTPA has suggested that the preliminary Red Data status of this new species should be Critically Endangered. The species appears to favour arid woodland on rocky hillslopes and flowers at the end of summer. Within the project area it is only known from a small area on a hill slope above the North Decline.

Zantedeschia pentlandii – this well-known bulb is endemic to the SCPE and is most common at higher altitudes in the upper Dwars River valley and the Roossenekal area. It has a National Red Data status of Vulnerable and is threatened by illegal collecting. Scattered specimens were located in Lydenburg – Vitex Open Woodland, Protea – Tristachya Open Woodland and Xerophyta – Myrothamnus Sheetrock Shrubland within the project area.

Resnova sp. aff. *megaphylla* – this is a bulbous plant that appears to be very similar to Resnova megaphylla, which has a Red Data status of Vulnerable. However, this species complex has not yet been satisfactorily described and there is some measure of uncertainty over the precise identification of the Two Rivers taxon. It is confined to shady areas below large boulders on the upper east-facing slopes, only in Lydenburgia – Vitex Open Woodland and Lydenburgia – Olea Outcrop Thicket.

Thirty-one (31) plants species are endemic or near-endemic to the Sekhukhuneland Centre of Plant Endemism (27), the Wolkberg Centre of Plant Endemism (1) or Mpumalanga (3). The most range-restricted of these are the new *Gladiolus sp.* described above, *Zantedeschia pentlandii, Aloe fouriei*

and Resnova sp.aff. megaphylla. Forty-three species are protected by legislation, in terms of the Mpumalanga Nature Conservation Act (No.10 of 1998), the Limpopo Environmental Management Act, 2003 (No. 7 of 2003) and the National Forests Act, 1998 (No. 38 of 1998)

Twenty-four (24) plant species with either national or provincial Red Data status potentially occur within the vicinity. However, most of these have only a Moderate to Low chance of occurring.

Fauna (Plant Life)

The following baseline information for the existing mining area was extracted from the EMP/EIA (GCS 2015)

Mammals

Twenty-eight (28) mammal species were confirmed to occur on Dwarsriver 372 KT during fieldwork in 2008, four of which have Red Data status and seven of which are protected. The highest species diversity was reported in Plains Woodland with 23 species, followed by Closed Woodland on Rocky Mountain Slopes with 22 species. More extensive fieldwork, including more nocturnal surveys, would have produced a slightly longer list. A total of 72 trap nights was achieved during 2008 fieldwork, with only three rodent species being caught.

Birds

As a result of the presence of numerous habitats on the property, including man-made, as well as an elevation varying from 890m to 1 513m, a high diversity of species was recorded. The quarter-degree grid 2430 CC, in which the study area falls, supported 268 bird species during the Southern African Bird Atlas Project, a total reflecting high diversity and but perhaps only moderate observer coverage. The greater Kennedy's Vale area was rated as being of Low conservation importance for birds by the Mpumalanga Tourism & Parks Agency (MTPA).

A total of 221 bird species was recorded during fieldwork, a fairly comprehensive list and a number which more extensive fieldwork would only slightly increase. The highest species diversity was reported in Plains Woodland with 145 species, followed by Closed Woodland on Rocky Mountain Slopes with 120 species.

Seven of the bird species potentially occurring in the vicinity of the mine are protected under the National Environmental Management: Biodiversity Act (No.10 of 2004), namely Southern Ground Hornbill, Martial Eagle, Cape Vulture, White-backed Vulture, Tawny Eagle, Bateleur and Lesser Kestrel.

Reptiles and Frogs

Twenty-nine (29) reptiles and ten frogs were confirmed to occur during fieldwork. Of these, four are endemic (Van Dam's Girdled Lizard, Transvaal Thick-toed Gecko, Sekhukhune Flat Lizard and Clicking Stream Frog) and five are protected under the National Environmental Management: Biodiversity Act 2004 (No. 10 of 2004): Water and Rock Monitors, Leopard and Lobatse Hinged Tortoises and Van Dam's Girdled Lizard. The highest species diversity for reptiles was reported in Open Woodland on Rocky Mountain Slopes (15 species) and for frogs Riverine Wetland (8 species).

The mining area is in an area classified as being of Low importance for both reptiles and frogs but is home to a moderate diversity of species. A total of 21 conservation-important reptiles and frogs potentially occur. Of the species potentially occurring, one has Red Data status, namely Southern African Python. This large snake favours broken, hilly savannas, particularly if close to water, and therefore has a High likelihood of occurring on the property. It is listed as Vulnerable, mainly due to the traditional medicine trade and direct persecution by landowners.

Selected Invertebrates

Pycna sylvia, South Africa's largest endemic cicada species was thought to be extinct until its recent rediscovery during an EIA survey at Der Brochen in 2001. It has been suggested (Malherbe 2002, Malherbe et al. 2004, Harrison 2005) that *Vitex obovata subsp. wilmsii* may be the main food plant for nymphs of *Pycna sylvia*, and that the adult cicadas also preferentially feed on this tree species, albeit with less fidelity. Subsequent observations by our team suggest that the presumption of a close association of *P. sylvia* with *Vitex obovata* may have been over-hasty and based on inadequate data.

Air Quality

Reference is made to the Air Quality Assessment, Airshed Planning Professionals (December 2012), for description of the baseline conditions.

The information contained in this section has been extracted from this report which was undertaken with the focus on the TRP current operations. The sensitive receptors closest to the TRP mine (approximately 3km to the west of the proposed TSF site) are two informal settlements, referred to as Village 1 and Village 2 in the air quality report and the residential areas of Ga-Mampuru, Kokwaneng, Madimola and Didingwe River Lodge.

Local source contributors to ambient PM_{10} (airborne particulates) concentrations in the vicinity of the study site are:

- Domestic fuel burning and vehicle activity in residential areas/sensitive receptors close to the mine;
- Surrounding chrome and platinum mining activities;
- Cattle ranching in the Steelpoort Valley;
- Agricultural activities and limited cultivation in fertile areas adjacent to the Steelpoort River.

It can be assumed the surrounding chrome and platinum mining activities is the largest source contributor in the area. The rock dumps, gravel roads, crushing of ore, possible open pit operations and TSFs associated with these mines produce dust which contributes to the overall atmospheric dust load in the area.

Typical mitigation measures such as a speed limit of 30km/h implemented will serve a triple purpose: Reduce dust fallout, reduce exhaust emissions and ensure the safety of workers. Another measure is through dust suppression by means of spraying water on surrounding roads.

Noise

Mining and mining activities often emit significant noise levels which can become a nuisance or health risk to mine workers and fauna within the mining area, but also to the surrounding land users and occupiers and fauna. The most sensitive receptors identified for the project area is the surrounding communities including land users, mine workers, mining communities and permanent farm homesteads and settlements. The region is predominantly occupied by mining, tourism and agricultural land uses.

The main noise generation activities of the proposed development during all phases are:

Operation phase:

- Transportation of materials; and
- Offloading of materials.

Closure or care and maintenance phase:

- Limited number of vehicles moving around the site.

Noise generation can therefore be expected on the proposed site due to activities and actions as indicated above. Noise levels may possibly exceed allowed limits for noise as indicated in SANS 10103: 2008. The sensitive receptors should be established during the Environmental Impact Assessment Phase and it should be established whether the distance from the site and natural noise breaks, such as vegetation in between will make noise levels acceptable.

The existing noise levels in the vicinity of the TRP site include traffic on the R555 road and mining activities. Environments which are recognized as being noise sensitive include residential areas, offices, educational facilities and health and church buildings.

None of these sensitive environments exist in close proximity to the TRP mining area. It will however still be important to implement a noise monitoring programme to monitor noise levels and implement mitigation measures should the set limits be exceeded.

Visual

Reference is made to the Visual Impact Assessment (2013), for description of the baseline conditions.

The mining area lies in the valley of the Dwars and Groot Dwars Rivers, surrounded by large hills which form part of the Schurinksberg range. The majority of the land use is occupied by thicket / bushland with mining activities forming a major part of the greater precinct. The area has a rural, bushveld atmosphere with mining activity forming a major part of the regional economy.

From the study it was established that the existing mining area presents a moderately disturbed sense of place. Although it is disturbed, the pleasant scenery and rural atmosphere adds attraction to the region.

Archaeology and Heritage

In 2002, Anton von Vollenhoven conducted the Heritage Impact Assessment (HIA) for the initial mine application. A heritage assessment looking specifically at the UG2 and Merensky expansion project area was conducted in 2012 (Shasa, 2012). No additional Heritage Impact Assessment will be undertaken for the expansion of the underground area as no surface infrastructure will be constructed.

The results from the 2012 studies showed that large areas of this proposed project area are already under mining operations. Primary focus was on the area's leading north from the current mining area where survey took place to determine if any areas would be viable for expansion. The areas covered, from the existing mine, indicated both Iron Age and historical occupation, but no sites of heritage significance. Graves were found in these areas but have since been relocated prior to the start of trial mining, in consultation with the affected community.

For the 2013 expansion project (NEMA EIA) the, South African Heritage Resource Agency requested a desktop palaeontological study for the proposed TSF and Pipeline route. The study was undertaken by Wits University in 2013. No palaeontological resources are expected in the mining area. The figure below is an indication of all the Heritage resources currently present and protected at TRP.

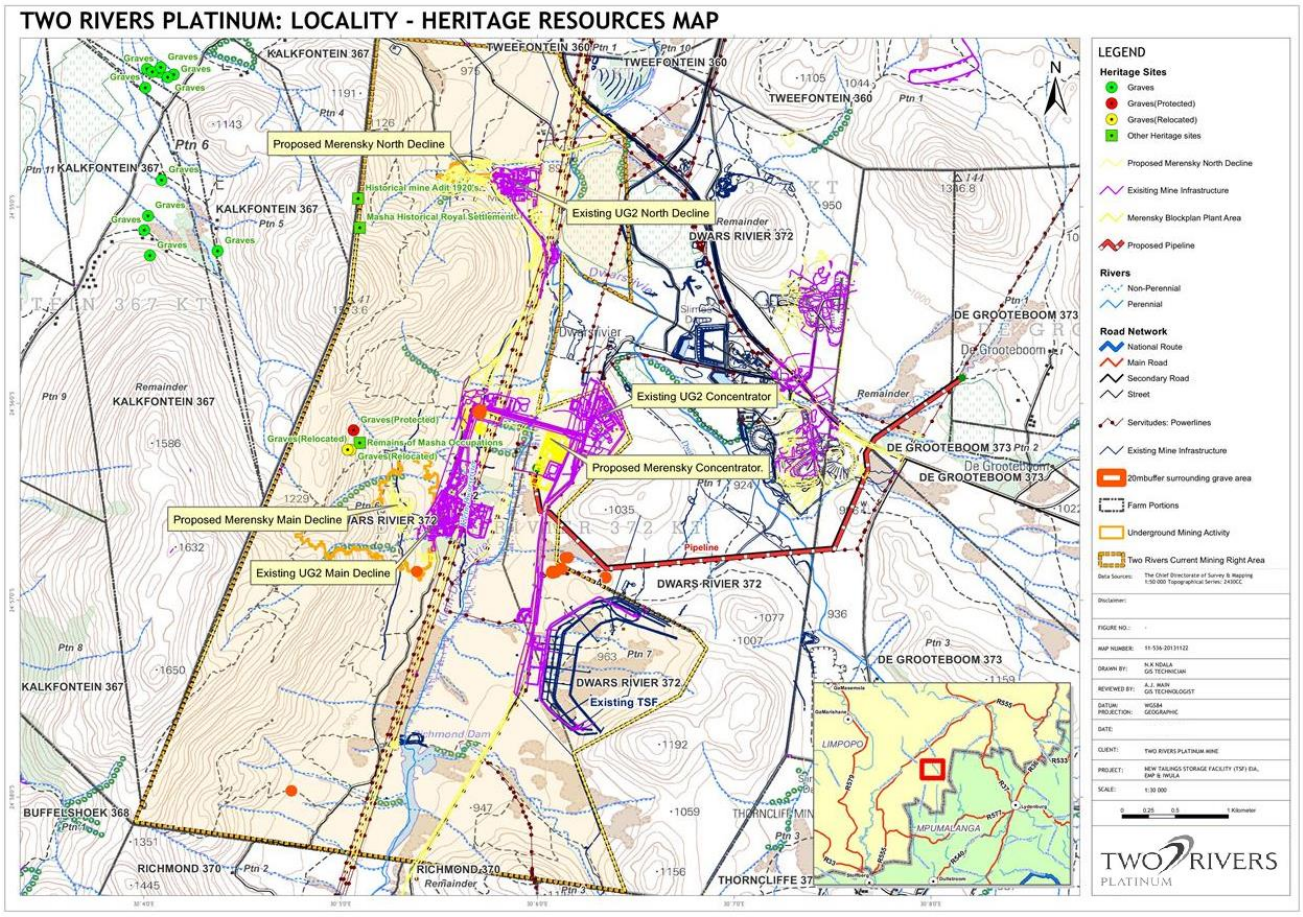


Figure 8: Heritage Resources at TRP (GCS, EMP 2015)

Social-Economic Environment

The information in the following section was extracted from the Environmental Management Programme Report (EMPR) realignment document (GCS, 2015) and the Social Impact Assessment (SIA) report compiled by GCS, 20012.

This section provides a delineation of the study area and a brief economic status quo pertaining to employment and labour profile.

Limpopo Province has the fourth largest population in the country. In 2001, the province's population was estimated at 5 273 637 people, consisting of several ethnic groups distinguished by culture, language and race. The Northern Sotho (Sepedi) people make up the largest number, being nearly 57%. The Tsonga (Shangaan) speakers comprise 23%, while the Venda people make up 12%. Afrikaans speakers comprise 2.6%, while English-speaking whites are less than half a percent.

Approximately 97% of the population is Black, 2% is White, and less than a percentage is Coloured or Asian.

Within the Greater Tubatse Local Municipality (LM), the Integrated Development Plan (IDP) reports that the northern section of the LM has the most marginalised economy of the region and has no economic base. However, with the development of mines in the LM, the area has started to benefit economically mines in many ways (2012/3). The IDP, however, also highlights that although there are several mines in the area, the existing resources remain unexploited. The LM views investment in this sector as very important as it brings with it investment in infrastructure, results in creation of job opportunities, etc.

According to the Greater Tubatse LM IDP (2012/3), the region's main economic drivers and future development thrusts are the following:

- Mining cluster development;
- Horticulture development;
- Meat cluster development;
- Tourism cluster development;
- Nodal development; and
- Informal sector development.

The main challenges facing economic development within the Greater Tubatse LM are (IDP, 2012/3):

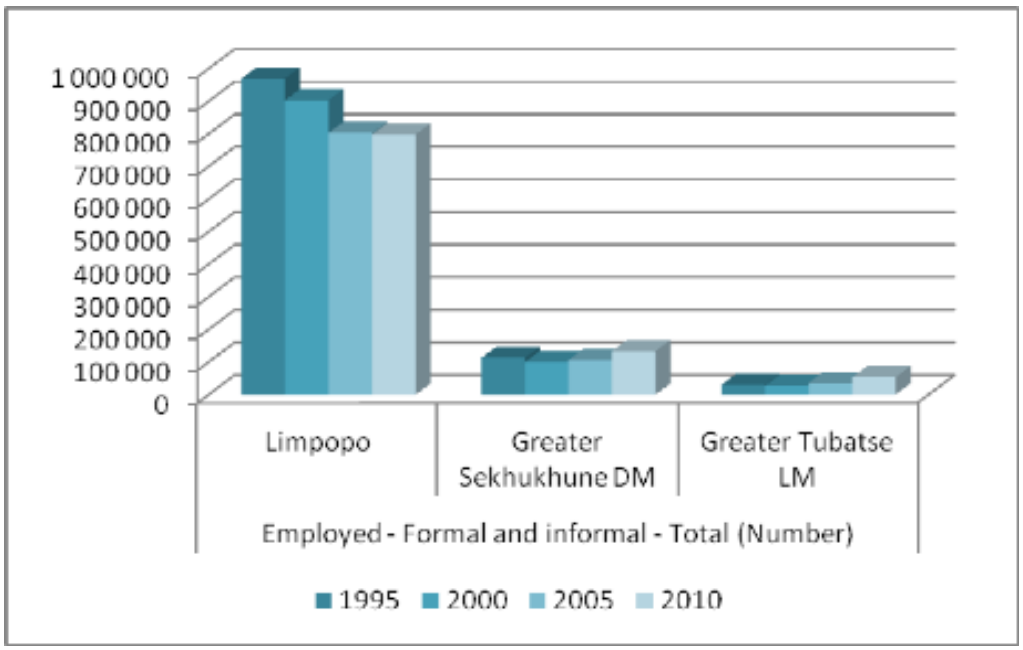
- Brain drain;
- High level of illiteracy;
- Lack of infrastructure for agriculture and tourism development;
- Migration and immigration; and
- High level of HIV/Aids.

Below is an indication of the main economic indicators for the region as a whole.

Employment and labour profile

The employment status of the population has a variety of important implications. Economically active and employed persons can contribute to the overall welfare of a specific community by paying their taxes, looking after the youth and aged and by stimulating the economy. However, should a community have a large number of economically inactive and / or unemployed persons, the burden on the Environmental Assessment Practitioner (EAP) of that community are amplified.

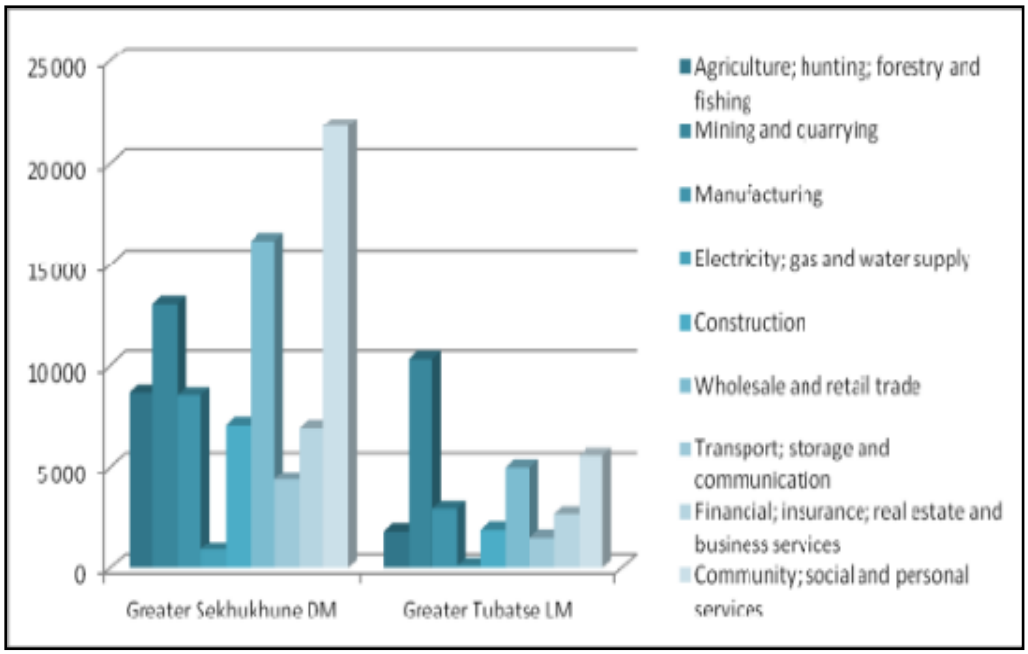
The figure below, illustrates that the Greater Tubatse LM unemployment increased dramatically between 1995 and 2010, increasing by 31.17%. This is considerable when comparing the slight increase of 2.49% for Limpopo Province and the significant decrease of 15.31% for the Sekhukhune DM. The province has, however, seen a decrease of 21.41% in the number of employed persons, with this number increasing for both the Sekhukhune DM (15.86%) and Greater Tubatse LM (44.67%).



Source: South African Community Survey 2007

Figure 9: Economic status (1995 – 2010) – (Source: GCS, 2015 EMP)

The most employment within the DM is created by the community, social and personal services industry as indicated in the figure below. The mining and quarrying industry has been the strongest industry within the LM over the same period.



Source: South African Community Survey 2007

Figure 10: Industry (2007)

Services and infrastructure profile

Social service delivery centres on the provision of health, education and community development facilities and services. The concept of service delivery also comprises various elements such as affordability, quality, efficiency and access.

This indicator therefore examines the level of service provision in the study area. Services assessed include sanitation, water, housing and electrification. There are three (3) priority services (water, sanitation and electricity) for the promotion of health, convenience and quality of life.

Housing

According to the figure below, the Greater Tubatse LM has a similar housing profile as that of the DM. A house or brick structure on a separate stand or yard is the noted most frequently, while informal dwellings/shacks NOT in a backyard are found the most frequent out of any other type of housing, excluding a house or brick structure on a separate stand or yard.

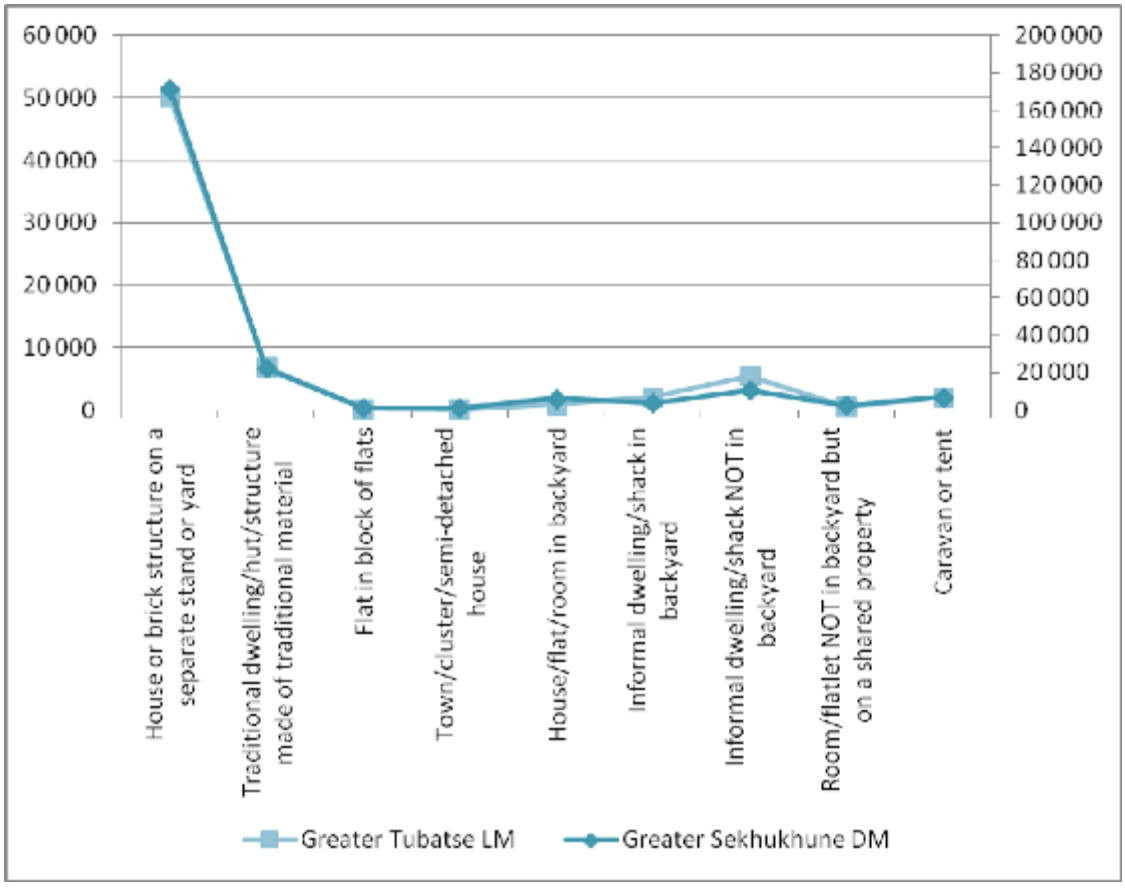


Figure 11: Type of dwelling (1995 / 2010)

According to the Greater Tubatse LM IDP (2012/3), approximately 50% of the land in Greater Tubatse LM area is currently under land claims. The claims are almost exclusively in rural areas that were part of the former Lebowa territory. The only land claim was lodged near an urban area, and that was in Steelpoort with none in Burgersfort and Ohrigstad. In the first quarter of 2007 the records of the Limpopo Land Claims Commissioner indicated that, out of 52 land claims that were lodged in the LM, 13 have been gazetted and 39 are in the process of being gazetted. Nearly 48 % of land claims have been submitted by the communities, 24 % by tribal authorities, and 18 % by individual persons (private claimants).

Energy use

As indicated in the table below, the use of electricity for lighting in the LM has increased between 1995 and 2010 by 76.50%. With the increase in electrification, the Limpopo Province and the DM has shown a decrease in all other methods of creating light. The use of solar/other/unspecified sources has increased by 5.70% and the use of gas has increased with 12.61% for the LM between 1995 and 2010.

Table 15: Percentage Change in use of energy from 1995 to 2010

	Limpopo Province	Greater Sekhukhune DM	Greater Tubatse LM
Solar/other/unspecified	-0.03%	-122.01%	5.70%
Electricity	62.86%	59.99%	76.50%
Gas	-82.25%	-23.15%	12.61%
Paraffin	-508.99%	-330.20%	-162.23%
Candles	-90.56%	-118.06%	-50.18%

Source: Quantec Research (Pty) Ltd

Water

As indicated in Table 11 the Greater Tubatse LM has incrementally increased the level of water supply to households with the biggest improvement in piped water inside a yard. Households with access to piped water inside their dwellings have increased at a slightly slower rate. The LM has shown the best improvement within these categories, as compared to the Limpopo Province and the DM. The use of water from a dam, river, stream or spring has reduced across all three regions over the 1995 – 2010 time period.

Table 16: Percentage Change in form of water supply from 1995 to 2010

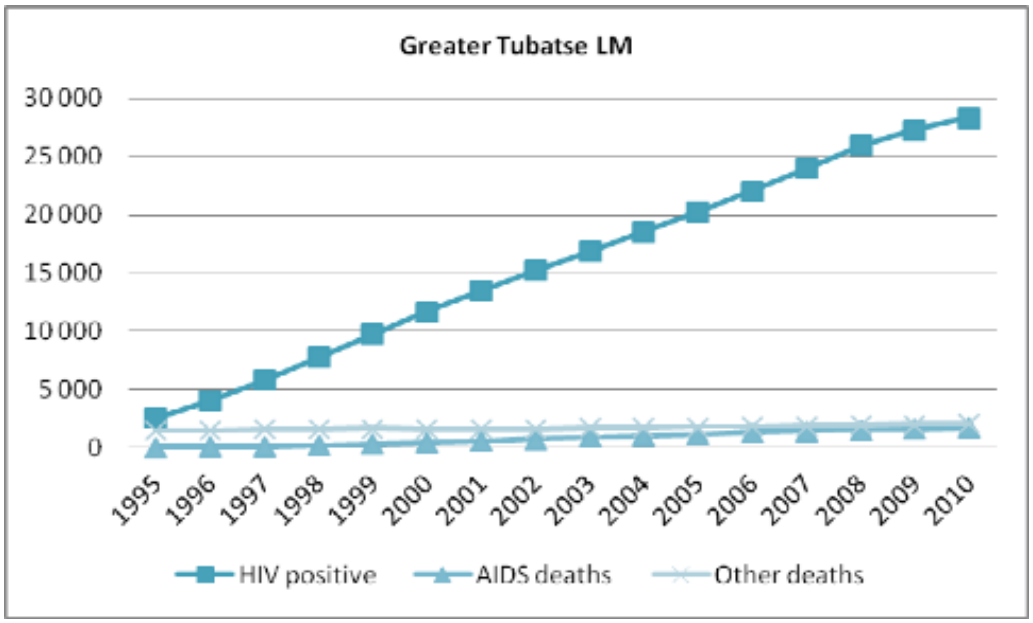
	Limpopo Province	Greater Sekhukhune DM	Greater Tubatse LM
Piped water inside dwelling	26.81%	25.82%	55.38%
Piped water inside yard	43.92%	37.21%	64.03%
Piped water on community stand: <200m from dwelling	33.08%	42.69%	52.93%
Piped water on community stand: 200m> from dwelling	26.89%	25.09%	36.19%
Borehole/rain-water tank/well	3.77%	13.58%	8.41%
Dam/river/stream/spring	-24.85%	-23.20%	-20.84%
Water-carrier/tanker/Water vendor	57.75%	69.67%	81.62%

Source: Quantec Research (Pty) Ltd

Healthcare

HIV/AIDS in South Africa has increased rapidly over the past decade. The social and economic consequences of the disease are far reaching and affect every facet of life in South Africa. Despite South Africa creating a progressive and far-sighted policy and legislative environment for dealing with HIV/AIDS, the prevalence of HIV/AIDS continues to increase. This indicates that policies and laws have not been adequately implemented and have not impacted significantly on the ground. The figure below is an indication of the number of HIV positive persons living within the Greater Tubatse LM in 2010 has increased by 90.80% since 1995. The number of HIV related deaths has increased by 96.53% over the same period, with the number of other deaths increasing slightly by 27.55%. These numbers in each case are higher than that of the Limpopo Province or the DM.

According to the Greater Tubatse LM IDP (2012/3), there are 11 medical facilities in the LM, which mainly constitute regional clinics, and can be found in areas such as Burgersfort, Bothashoek, Praktiseer, Ga-Makofane, Motshana, Ga-Mashabela, Ga-Motodi, Ga-Rantho GaRiba, Leboeng, Malokela, Mampuru, Montwaneng, Mophalema, Phiring, Taung, Motlolo and Ga-Selala. Clinics previously operated by the National Health Department can be found in Steelpoort, Ohrigstad and Burgersfort. These clinics offer improved service to the previously mentioned as they are equipped with better infrastructure. Specialist treatment is exclusively available at the major hospitals outside of the municipal area.



Source: Quantec Research (Pty) Ltd

Figure 12: HIV/AIDS status (1995 – 2010)

Roads

The Greater Tubatse LM has four (4) major transportation corridors along which major spatial activities are taking place, these are (IDP, 2012/3):

- Dilokong and Burgersfort (R37) Corridor;
- Stoffberg (R555) Corridor;
- Ngwaabe Corridor to Jane Furse; and
- The Hoedspruit (R36) Corridor.

The major roads allow for the development of nodes or settlements at certain appropriate points along the corridor which become an anchor of spatial development agglomeration, such as Burgersfort, Ohrigstad and Steelpoort.

(a) Description of specific environmental features and infrastructure on the site

Environmental Features

From the description of the baseline environment above, it is clear that some significant sensitive environmental features occur on the study area. The Klein Dwars River is runs through the existing mining area and a number of river crossings has been constructed as approved in the Water Use License. The confluence of the Klein and Groot Dwars River is 3.5km to the west of the project area. The flow from these rivers contributes to the Steelpoort River, which is a tributary of the Olifants River.

Some fifteen Red Data plants were confirmed to occur on the site. Three of these are significantly threatened and are in urgent need of conservation attention. The vegetation, on a regional scale, is however classified as 'Least Threatened' implying that the habitat types encountered in the study site, is highly likely well represented in the general region. Based on various ecological and biodiversity considerations the following faunal sensitivities are estimated for the terrestrial faunal habitats of the study area:

- Kirkia – Triaspis Woodland: medium-high faunal sensitivity;
- Lydenburgia – Vitex Open Woodland: medium-high faunal sensitivity; and
- Tristachya – Loudetia Grassland Slopes: medium-high faunal sensitivity.

The areas covered, from the existing mine, indicated both Iron Age and historical occupation, but no sites of heritage significance. Graves were found in these areas but have since been relocated prior to the start of trial mining, in consultation with the affected community.

Existing Infrastructure on the study area and in close proximity

The mine infrastructure presently consists of, *inter alia*, the following structures and infrastructure – Approved in the 2015 (GCS) EMP/EIA. The mine is a fully operational mine with two declines and associated processing infrastructure.

- Storm water dams, Drying Beds, Settling Dams and a treatment facility.
- Dirty Water Handling Infrastructure – RWD, Cut off trenches
- Overland ore conveyance
- Waste material stockpiles.
- High mast lighting. 10-15 high mast lights at each new shaft, in high traffic and security critical areas.
- Ore silo to provide surge capacity for the overland conveyor system.
- Office blocks
- Change houses – change facilities, ablution and storage lockers for 350 – 400 people at each shaft.
- Lamp and crush facility at each shaft
- Roads
- Haul Roads
- Bus stop and parking for personnel and visitors.
- Security and access control.
- Cable storage and salvage yard
- Sewage (treatment plants included as vendor supplied units, sized according to personnel complement.
- Firefighting and prevention (fire hydrants and hose reels, electric and diesel pumps to operate the deluge systems in the main substations of both shafts).
- Storm Water Management (cut off drains and berms at the Main and North shafts).
- General stores at each shaft for rock drills, rotary equipment, batteries and gas cylinders.
- Explosive stores (a local explosives magazine to cater for daily usage, filled daily from the primary storage).
- Bulk fuel and lubricant storage (to receive store and dispense a week's consumption of each product).
- Miscellaneous facilities: portal rainwater sump and drain, dirty water sump and drain, covered walkways, brake test ramp, refuse disposal facilities, electrified fencing around the perimeter of the infrastructure.
- Processing plants (UG 2 and Merensky)

- ROM Circuits, Silo's and Stockpiles
- Primary processing plant
- Secondary processing plant
- Underground infrastructure (refuge bays, workshops, offices and diesel and lubricant storage)
- Existing Tailing Storage and Waste Rock Disposal Facilities; and
- New Tailings Storage Facility and associated pipeline.

Roads

The R577 provincial road approximately 1km north of the site and the R555 provincial road is about 5km to the west of the site. Access to the site is obtained from the R577 onto a tared road leading to the processing plant and mining area. There are also haul roads within the mining area.

Railway line

No railway lines occur in close proximity to the study area.

Powerlines

A number of Eskom servitudes are located on the mining area. The mine is supplied by Eskom from the two 30MVA, 33/11kV transformers.

Water

TRP water is supply from the Klein and Groot Dwars Rivers, and the Inyoni dam located within the Klein Dwars river catchment. No additional water supply is required for expansion of the existing UG2 mine.

Sewage

Both Shafts have existing sewage treatment plants and will be used as-built without any additions or extensions.

(b) Environmental and current land use map

(Show all environmental, and current land use features)

Refer to Appendix E

10. Impacts identified

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts)

Potential impacts that may be caused by the proposed development will be identified using input from the following:

- Views of I&APs;
- Existing information;
- Specialist investigations;
- Site visit with the project team; and
- Legislation.

The following potential major direct, indirect and cumulative impacts were identified:

- Land degradation
- Potential to alter the topography
- Loss of soil characteristics - erosion and compaction
- Potential for alien invasive establishment
- Reduced flow to downstream water catchment
- Potential pollution to water resources (surface and groundwater)
- Drawdown cone from dewatering activities (groundwater quantity)
- Increased dust and emissions
- Increased noise levels
- Damage to property/infrastructure from blast events
- Potential damage to heritage sites (grave and/or archaeological artefacts)
- Influx of job seekers to the area
- Potential increased traffic – haulage
- Health and safety impacts;
- Potential injury and loss of health and life of humans; and
- Altered Socio-Economic Environment (Positive or negative).

Table 17: Impacts during the construction phase – general impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CONSTRUCTION PHASE					
GENERAL IMPACTS					
N/A		-			
N/A					

Table 18: Impacts during the construction phase activity specific impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CONSTRUCTION PHASE					
ACTIVITY SPECIFIC IMPACTS					
N/A					

It should be noted that no construction phase is anticipated as the current underground mining section will only be extended into the proposed underground section. No surface infrastructure construction is anticipated.

Table 19: Impacts during the operational phase – general impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
GENERAL IMPACTS					
	GEOLOGICAL AND SOILS	Soil erosion and soil compaction by heavy duty vehicles on site.	Medium (-)	Probable	Medium term
		Contamination of soils through: - Indiscriminate disposal of waste; and - Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from vehicles and other chemicals from operational and maintenance activities e.g. paints.	Medium (-)	Possible	Long term
	HYDROLOGICAL SURFACE WATER AND GROUNDWATER	Stormwater, erosion and siltation impacts due to a lack of implementing measures to manage stormwater run-off quantity and quality during the operational phase.	Medium (-)	Possible	Long term
		Contamination of stormwater runoff and ground water, caused by: - Sediment release; - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles; - Other chemicals from maintenance activities e.g. paints; and - Effluent discharges, due to a lack of stormwater management and system maintenance. - Underground mining and blasting – Nitrate pollution	Medium (-)	Possible	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
GENERAL IMPACTS					
		Impacts of dewatering on the groundwater aquifer should water be abstracted from ground water during the operational phase.	Medium (-)	Probable	Long term
	BIOLOGICAL FAUNA AND FLORA	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	Low (-)	Unlikely	Permanent
		Spreading of alien invasive species and bush encroachment of indigenous species.	Medium (-)	Possible	Long term
	EXISTING LAND USE	Possibility of mining activities and workers causing veld fires destroying veld and animals on the study area and on adjacent land, impacting on the livelihood of surrounding land owners and users.	Medium (-)	Possible	Long term to Permanent
	VISUAL	Visibility from sensitive receptors / visual scarring of the landscape and impact on 'Sense of Place' as a result of the visibility of the mining site including the waste management facilities and mining activities.	Low (-)	Definite	Long term
		Visibility of solid domestic and operational waste.	Medium (-)	Definite	Long term
	NOISE, VIBRATION AND LIGHTING	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the operation of the mining activities and processing.	Low (-)	Definite	Medium term
		Disturbance due to vibrations caused by vehicles.	Low (-)	Definite	Medium term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
GENERAL IMPACTS					
		Impact of security lighting on surrounding landowners and animals.	Low (-)	Definite	Long term
	AIR QUALITY	Increased dust pollution (soil and ore fines), vehicles on gravel roads and storage of tailings and waste rock, as well as other mining and processing activities.	Medium (-)	Definite	Long term
		Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term
	WASTE (INCLUDING HAZARDOUS WASTE)	Generation and disposal of general waste, litter and hazardous material during the operational phase and operational waste i.e. waste rock, tailings etc.	High (-)	Definite	Long term
	SERVICES	Need for services e.g. water, electricity and sewerage systems, causing additional strain on natural resources and service infrastructure.	Low (-)	Unlikely	Long term
	TRAFFIC	The change in the traffic patterns as a result of increased traffic entering and exiting the operations on the surrounding road infrastructure and existing traffic.	Low (-)	Unlikely	Long term
		Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.	Medium (-)	Possible	Long term
	HEALTH AND SAFETY	Possibility of mining activities and workers causing veld fires, which can potentially cause injury and or loss of life to mine workers and surrounding landowners, visitors and workers.	Medium (-)	Possible	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
GENERAL IMPACTS					
		Increased risk to public health and safety: Dangerous areas including the waste management activities and waste poses health risks and possible loss of life to mine workers and visitors to the site.	Medium (-)	Possible	Long term
	SOCIO-ECONOMIC	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on groundwater, dust pollution, noise pollution etc.	Low (-)	Definite	Long term to permanent
		Extended employment provision due to the implementation of the extension of the mining activities, allowing mining activities to continue for additional years.	High (+)	Definite	Long term
		Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	Medium (+)	Possible	Long term

Table 20: Impacts during the operational phase – activity specific impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY SPECIFIC IMPACTS					
Extending of the underground mining sections	HYDROLOGICAL SURFACE WATER AND GROUNDWATER	Impact of Nitrate based explosives used during mining on groundwater quality. Contamination plume can affect the groundwater resource.	Medium (-)	Definite	Long term
		Impacts of dewatering on the groundwater aquifer should water be abstracted from ground water during the operational phase.	Medium (-)	Probable	Long term
	WASTE	Generation and disposal of additional hazardous operational waste i.e. waste rock, tailings, etc.	Medium (-)	Definite	Long term
	HEALTH AND SAFETY	Increased risk to public and worker health and safety.	Medium (-)	Possible	Permanent
	SOCIO-ECONOMIC	Extended employment provision due to the implementation of the extension of the mining activities, allowing mining activities to continue for additional years.	High (+)	Definite	Long term
Loading, hauling and conveying RoM to Processing Plant	HYDROLOGICAL SURFACE WATER AND GROUNDWATER	Possible impact on surface and groundwater from contaminated process water.	Low (-)	Probable	Long term
		Possible impact of spills and overflows from pollution control dams and facilities.	low (-)	Possible	Medium term
	WASTE	Generation and disposal of additional hazardous operational waste i.e. waste rock, tailings, etc.	Medium (-)	Definite	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY SPECIFIC IMPACTS					
	AIR QUALITY	Increased dust pollution (soil and ore fines), vehicles on gravel roads and transport of RoM	Medium (-)	Definite	Long term
		Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term
	HEALTH AND SAFETY	Increased risk to public and worker health and safety.	Medium (-)	Possible	Permanent
	SOCIO-ECONOMIC	Extended employment provision due to the implementation of the extension of the mining activities, allowing mining activities to continue for additional years.	High (+)	Definite	Long term
Processing of RoM	HYDROLOGICAL SURFACE WATER AND GROUNDWATER	Impact on surface and groundwater from contaminated process water.	Low (-)	Probable	Long term
		Impact of spills and overflows from pollution control dams and facilities.	low (-)	Possible	Medium term
	WASTE	Generation and disposal of additional hazardous operational waste i.e. waste rock, tailings, etc.	Medium (-)	Definite	Long term
	HEALTH AND SAFETY	Increased risk to public and worker health and safety.	Medium (-)	Possible	Permanent
	AIR QUALITY	Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE OPERATIONAL PHASE					
ACTIVITY SPECIFIC IMPACTS					
	SOCIO-ECONOMIC	Extended employment provision due to the implementation of the extension of the mining activities, allowing mining activities to continue for additional years.	High (+)	Definite	Long term
Deposition of waste rock and tailings onto waste rock dumps and tailings storage. Maintenance of the tailings dams and waste rock dumps.	HYDROLOGICAL SURFACE WATER AND GROUNDWATER	Seepage from waste management activities e.g. waste rock dumps, could cause a contamination plume affecting the underground water resources.	Medium (-)	Probable	Long term
		Discharge from Tailing Storage facilities and associated water handling infrastructure can cause contamination of surface water resources.	Medium (-)	Probable	Long term
	WASTE	Generation and disposal of additional hazardous operational waste i.e. waste rock, tailings, etc.	Medium (-)	Definite	Long term
	AIR QUALITY	Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term
	HEALTH AND SAFETY	Increased risk to public and worker health and safety.	Medium (-)	Possible	Permanent
	SOCIO-ECONOMIC	Economic impact should there be an incident of public health and safety.	Medium (-)	Possible	Long term

Table 21: Impacts during the closure phase – general impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CLOSURE AND POST-CLOSURE PHASES					
GENERAL IMPACTS					
	GEOLOGICAL AND SOILS	Soil compaction by heavy duty vehicles.	Medium (-)	Possible	Medium term
		Contamination of soils through: - Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from heavy duty vehicles and other chemicals.	Medium (-)	Possible	Short term
	HYDROLOGICAL SURFACE WATER AND GROUNDWATER	Stormwater, erosion and siltation impacts due to a lack of implementing measures to manage stormwater run-off quantity and quality during the closure phase.	Medium (-)	Possible	Medium term
		Contamination of stormwater runoff and ground water, caused by: - Sediment release; - Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from heavy duty vehicles; - Effluent discharges, due to a lack of stormwater management.	Medium (-)	Possible	Short term
		Impacts of dewatering on the groundwater aquifer should water be abstracted from ground water during the closure phase.	Medium (-)	Possible	Short term
		Impaction groundwater from the pollution plume associated with the waste storage facilities and underground mining.	Medium (-)	Possible	Medium term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CLOSURE AND POST-CLOSURE PHASES					
GENERAL IMPACTS					
	BIOLOGICAL	Disturbance and loss of fauna through noise, light and dust pollution as well as hunting, trapping and killing of fauna.	Low (-)	Definite	Long term
		Spreading of alien invasive species and bush encroachment of indigenous species.	Medium (-)	Possible	Long term
	VISUAL	Visibility from sensitive receptors / visual scarring of the landscape as a result of the closure and rehabilitation activities.	Low (-)	Definite	Long term
		Visibility of solid domestic and operational waste.	Low (-)	Possible	Long term
	NOISE, VIBRATION AND LIGHTING	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the operation of heavy duty vehicles and equipment.	Low (-)	Definite	Long term
		Disturbance due to vibrations caused by heavy duty vehicles.	Low (-)	Probable	Long term
		Impact of security lighting on surrounding landowners and animals.	Low (-)	Definite	Long term
	AIR QUALITY	Dust (soil and ore fines) pollution due to rehabilitation activities and heavy duty vehicles.	Medium (-)	Definite	Long term
		Windborne dust (soil and ore fines) and vehicle fumes and particulate matter PM10, altering air quality.	Medium (-)	Definite	Long term
	SERVICES	Need for additional services i.e. water, electricity and sewerage systems during the closure phase causing additional strain on natural resources and infrastructure.	Low (-)	Unlikely	Long term

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CLOSURE AND POST-CLOSURE PHASES					
GENERAL IMPACTS					
	TRAFFIC	The change in the traffic patterns as a result of traffic entering and exiting the proposed mine on the surrounding road infrastructure and existing traffic.	Low (-)	Possible	Long term
		Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.	Low (-)	Possible	Long term
	HEALTH AND SAFETY	Possibility of closure activities and workers causing veld fires, which can potentially cause injury and or loss of life to workers and surrounding landowners and visitors.	Medium (-)	Possible	Long term to permanent
		Increased risk to public health and safety: Dangerous areas including the waste management facilities poses health risks and possible loss of life to mine workers and visitors to the site.	Medium (-)	Possible	Long term to Permanent
		Increased risk to public and worker health and safety.	Medium (-)	Possible	Long term to permanent
	SOCIO-ECONOMIC	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on groundwater, dust pollution, noise pollution etc.	Medium (-)	Definite	Long term to permanent
		Economic impact should there be an incident of public health and safety.	Medium (-)	Possible	Medium term
		Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time.	Medium (+)	Possible	Long term

Table 22: Closure and post-closure specific impacts

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
IMPACTS DURING THE CLOSURE AND POST-CLOSURE PHASES					
PHASE SPECIFIC IMPACTS					
Rehabilitation of site, removal of infrastructure, sealing of shafts and closure of waste facilities	GEOLOGICAL AND SOILS	Soil erosion	Medium (-)	Definite	Long term
	HYDROLOGICAL SURFACE WATER AND GROUNDWATER	Seepage from waste management facilities could cause a contamination plume affecting the underground water resources.	Medium (-)	Probable	Long term
		Ground water pollution	Medium (-)	Probable	Long term
	WASTE	Generation and disposal of additional hazardous operational waste i.e. waste rock and tailings.	Medium (-)	Definite	Long term
	BIOLOGICAL FAUNA AND FLORA	Rehabilitation of area with natural vegetation and re-establishment of local biodiversity	Medium (-)	Definite	Long term

Table 23: Impacts as a result of not implementing the proposed development

ACTIVITY	ENVIRONMENTAL ASPECT	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	PROBABILITY	DURATION
NO-GO ALTERNATIVE					
N/A	SOCIO-ECONOMIC	Reduced period of providing employment for local residents and skills transfer to unskilled and semi-skilled unemployed individuals.	Very high (-)	Definite	Permanent
		Reduced period of development and upliftment of the surrounding communities and infrastructure.	Very high (-)	Definite	Permanent
		Reduced period of development of the economic environment, by job provision and sourcing supplies for and from local residents and businesses.	Very high (-)	Definite	Permanent
		Positive: No additional negative impacts on the environment	Medium (+)	Definite	Permanent
		Retrenchment as a result of closure of the mine	Very high (-)	Definite	Permanent

iv) Methodology used in determining the significance of environmental impacts

A “significant impact” is defined as it is defined in the EIA Regulations (2014): “an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence”. The objective of this EIA methodology is to serve as framework for accurately evaluating impacts associated with current or proposed activities in the biophysical, social and socio-economical spheres. It aims to ensure that all legal requirements and environmental considerations are met in order to have a complete and integrated environmental framework for impact evaluations.

Environmental Impact Assessment (EIA) Regulations, 2017 [as amended] requirements

The Environmental Impact Assessment (EIA) 2014 Regulations [as amended] promulgated in terms of Sections 24 (5), 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA), requires that all identified potential impacts associated with the proposed project be assessed in terms of their overall potential significance on the natural, social and economic environments. The criteria identified in the EIA Regulations (2014) include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact
- Probability of the impact occurring;
- Degree to which impact can be reversed;
- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated; and
- Cumulative impacts.

Malan Scholes Consulting has developed an impact assessment methodology (as defined below) whereby the Significance of a potential impact is determined through the assessment of the relevant temporal and spatial scales determined of the Extent, Magnitude and Duration criteria associated with a particular impact. This method does not explicitly define each of the criteria but rather combines them and results in an indication of the overall significance.

Malan Scholes Consulting Impact Assessment Methodology

The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented below.

Extent of the impact

The EXTENT of an impact is the physical extent/area of impact or influence.

Score	Extent	Description
1	Footprint	The impacted area extends only as far as the actual footprint of the activity.
2	Site	The impact will affect the entire or substantial portion of the site/property.
3	Local	The impact could affect the area including neighbouring properties and transport routes.
4	Region	Impact could be widespread with regional implication.
5	National	Impact could have a widespread national level implication.

Duration of the impact

The DURATION of an impact is the expected period of time the impact will have an effect.

Score	Duration	Description
1	Short term	The impact is quickly reversible within a period of less than 2 years, or limited to the construction phase, or immediate upon the commencement of floods.
2	Short to medium term	The impact will have a short term lifespan (2–5 years).
3	Medium term	The impact will have a medium term lifespan (6 – 10 years)
4	Long term	The impact will have a medium term lifespan (10 – 25 years)
5	Permanent	The impact will be permanent beyond the lifespan of the development

Intensity of the impact

The INTENSITY of an impact is the expected amplitude of the impact.

Score	Intensity	Description
1	Minor	The activity will only have a minor impact on the affected environment in such a way that the natural processes or functions are not affected.
2	Low	The activity will have a low impact on the affected environment.
3	Medium	The activity will have a medium impact on the affected environment, but function and process continue, albeit in a modified way.
4	High	The activity will have a high impact on the affected environment which may be disturbed to the extent where it temporarily or permanently ceases.
5	Very High	The activity will have a very high impact on the affected environment which may be disturbed to the extent where it temporarily or permanently ceases.

Reversibility of the impact

The REVERSIBILITY of an impact is the severity of the impact on the ecosystem structure

Score	Reversibility	Description
1	Completely reversible	The impact is reversible without any mitigation measures and management measures
2	Nearly completely reversible	The impact is reversible without any significant mitigation and management measures. Some time and resources required.
3	Partly reversible	The impact is only reversible with the implantation of mitigation and management measures. Substantial time and resources required.
4	Nearly irreversible	The impact is can only marginally be reversed with the implantation of significant mitigation and management measures. Significant time and resources required to ensure impact is on a controllable level.
5	Irreversible	The impact is irreversible.

Probability of the impact

The PROBABILITY of an impact is the severity of the impact on the ecosystem structure

Score	Probability	Description
1	Improbable	The possibility of the impact occurring is highly improbable (less than 5% of impact occurring).
2	Low	The possibility of the impact occurring is very low, due either to the circumstances, design or experience (5% to 30% of impact occurring).
3	Medium	There is a possibility that the impact will occur to the extent that provision must be made therefore (30% to 60% of impact occurring).
4	High	There is a high possibility that the impact will occur to the extent that provision must be made therefore (60% to 90% of impact occurring).
5	Definite	The impact will definitely take place regardless of any prevention plans, and there can only be relied on migratory actions or contingency plans to contain the effect (90% to 100% of impact occurring).

Calculation of Impacts – Significance Rating of Impact

Significance is determined through a synthesis of the various impact characteristics and represents the combined effect of the Irreplaceability (Magnitude, Extent, Duration, and Intensity) multiplied by the Probability of the impact. The significance of an impact is rated according the scores a presented below:

Significance = Irreplaceability (Reversibility + Intensity + Duration + Extent) X Probability

Significance Rating

Score	Significance	Colour Code
1 to 20	Very low	
21 to 40	Low	
41 to 60	Medium	
61 to 80	High	
81 to 100	Very high	

Degree to which the impact can be mitigated: *The effect of mitigation measures on the impact and its degree of effectiveness.*

- High (Impact 100% mitigated)
- Medium (Impact >50% mitigated)
- Low (Impact <50% mitigated)

Confidence rating: *Level of certainty of the impact occurring*.

- **Certain**
- **Sure**
- **Unsure**

Cumulative impacts: *The effect the combination of past, present and "reasonably foreseeable" future actions have on aspects.*

- Very Low cumulative impact
- Low cumulative impact
- Medium cumulative impact
- High cumulative impact

v) The positive and negative impacts and alternatives

Potential impacts that were identified during the Scoping process, with inputs from I&APs, are discussed under environmental component headings in this section. These discussions should be read with the corresponding descriptions of the baseline environment.

The potential impacts associated with the project phases (construction, operations, decommissioning and closure) have been identified and described and reference has been made to the studies/investigations that are required to inform the impact assessment. In the absence of site specific studies the assessment conclusions are conservative. It follows that the assessment provided below is a preliminary assessment which will, after having obtained specialist input, be refined/changed as necessary in the EIA, as appropriate.

Biodiversity

In the broadest sense, biodiversity provides value for ecosystem functionality, aesthetic, spiritual, cultural, and recreational reasons. The known ecosystem related value is listed as follows:

- Soil formation and fertility maintenance;
- Primary production through photosynthesis, as the supportive foundation for life;
- Provision of food and fuel;
- Provision of shelter and building materials;

- Regulation of water flows and water quality;
- Regulation and purification of atmospheric gases;
- Moderation of climate and weather;
- Control of pests and diseases; and
- Maintenance of genetic resources (key for medicines, crop and livestock breeding).

The discussions below consider terrestrial and aquatic ecosystems.

Issue: Physical Loss and/or general disturbance of terrestrial biodiversity.

The existing habitat units of the project area have been impacted and degraded to some extent as a result of past and current mining and anthropogenic activities, however, the project area still contains habitat units which are considered to be ecologically sensitive. The proposed extension of the underground mining activities will not impact on terrestrial biodiversity. No surface infrastructure will be constructed and the existing surface infrastructure will be utilised.

The significance of this impact is low in the unmitigated scenario. No additional surface impact is anticipated. The processing of RoM will take place at the existing facility and disposal of waste will take place at the existing facilities. Existing mitigation measures will be maintained to ensure that the impact on biodiversity is kept low.

Water Resources - Surface Water

The discussion below considers surface water and focus on possible impact associated with the proposed project.

Issue: Reduction in surface water quantity and quality.

The proposed extension of the underground mining area have the potential to negatively impact on water resources. Surface water impacts are associated with the existing processing of ore and disposal of waste onto waste storage facilities. The mine has existing environmental authorisations and water use licenses in place. It is not anticipated that the extension of the underground mining area will have a negative impact on surface water directly, however the indirect impact associated with processing and disposal will be assessed and mitigation and management measures will be included in the EIA phase. In the absent of mitigation measures will the direct impact on surface resources be low and the indirect impact high. With mitigation measured the significance of the potential impacts can be reduce.

Water Resources – Groundwater

The discussion below considers groundwater and focus on possible impact associated with the proposed project.

Issue: Reduction in groundwater quantity and quality.

Mining projects have the potential to negatively impact on water resources through abstraction for water supply and dewatering activities, regardless of the alternatives that are selected. Mining projects also present a number of emission sources that can have a negative impact on water quality. Contaminants from the project are expected to include operation related consumables, silt, fuels, hydrocarbons, residues, blasting equipment and hazardous wastes. Nitrate pollution associated with the mining method is anticipated.

In the absence of mitigation, given the importance of the groundwater system and based on the mine plan as presented in this report, the severity of unmitigated impacts would be high. Regarding water quantity impacts, where water resources are used by third party users, potential impacts affecting third party supply could occur. Impacts could extend beyond the site boundary to the water users and could extend beyond closure. In time, losses in water quantities and reduced water qualities could be reversed, however, at this stage, the related time period is not known. The related unmitigated significance is high. Important to note is that the use or potential contamination of water resources is regulated through water use licensing requirements of the DWS as the custodian of water resources in South Africa. Where the project plan takes into account the findings of specialist studies, applies the necessary mitigation to avoid, minimises or remedy impacts in line with the mitigation hierarchy and operates under a water use license, the significance of potential impacts can be reduced.

Blasting and Vibration

Issue: Blasting and vibration related impacts.

The current mining method involve drill and blasting. Blasting activities have the potential to impact on people, animals and structures located in the vicinity of the proposed project area. The activity will continue from the existing underground mining area. As a result of the dip angle of the ore body mining will only extent deeper below the surface. It is important to note that with the deepening of the mining areas the blasting effects will reduce.

The potential impact could have a medium severity in the unmitigated scenario. In the mitigated scenario, this severity reduces to very low because measures can be taken to control blasts and associated impacts.

Socio-Economic

Issue: Positive and negative socio-economic impacts

Mining projects have the potential to have positive and/or negative impacts on the following, regardless of the alternatives that are selected:

- employment for local communities;
- the local and national economy;
- social structures within communities;
- increased pressure on basic services;
- quality of life and health related issues
- livelihoods of businesses

Socio-economic impacts would occur during all project phases. In the absence of mitigation that focuses on enhancing positive impacts and reducing negative impacts, the severity of unmitigated impacts would be medium for negative impacts and medium (positive) for positive impacts. The related unmitigated significance could be medium. Where the project planning takes into account and applies the necessary mitigation to avoid, minimises or remedy impacts in line with the mitigation hierarchy, the significance of potential negative impacts can be reduced and potential positive impacts can be increased.

vi) The possible mitigation measures that could be applied and the level of risk

Table 24: Mitigation measures

Activity	Potential Impact	Possible mitigation	Potential for residual risk
Underground mining – extension of underground mining area	Physical loss and/or general disturbance of terrestrial biodiversity	• Avoid sensitive areas as far as practically possible. • Implementation of an alien invasive species programme. • Limit emissions (dust, light, noise). • Training of employees on the value of biodiversity. • Zero tolerance for harming and harvesting fauna and flora. • Effective waste management and pollution prevention. • Effective rehabilitation to achieve post closure land use.	Low

	Reduction in surface water quantity and quality.	• Design and implement contamination containment measures.
		• Mine infrastructure will be constructed and operated so as to comply with the National
		• Water Act No. 36 of 1998 and Regulation 704 (4 June 1999):
		  ○ Clean and dirty water system will be separate.
		  ○ Clean run-off will be diverted away from the site.
		  ○ Dirty water will be contained.
		  ○ The necessary exemptions and approvals will be obtained for activities and
		  ○ Infrastructure located within 100 m or within the 1:100 year floodline of the River and its tributaries.
		• Conduct surface water monitoring and implement remedial actions as required.
		• Effective equipment and vehicle maintenance.
		• Fast and effective clean-up of spills.
		• Effective waste management.
		• Education and training of workers.
		• Implement WUL requirements and mitigation measures
		• Effective rehabilitation to achieve post closure land use.
			Low – direct impact
			Medium – indirect impact

Activity	Potential Impact	Possible mitigation	Potential for residual risk
	Reduction in groundwater quantity and quality.	• Groundwater pollution will be identified and included into a groundwater management plan which will be implemented as part of the operational and closure phase • Implement WUL requirements and mitigation measures. • Conduct groundwater monitoring and implement remedial actions as required. This includes compensation for mine related loss of third party water supply. • Effective equipment and vehicle maintenance. • Fast and effective clean-up of spills.	Medium
	Blasting and vibration related impacts	• Develop and implement a vibration and blast management plan which addresses vibration and blast design criteria to limit ground vibration. • Remediation of all impacts caused by vibration and blasting.	Low
	Positive and negative socio-economic impacts	• Develop and implement procedures for recruiting, training and procurement that align with good industry practise (SLP). • Employ local people and procure goods and services locally as far as practically possible. • Effective communication to manage expectations with regard to employment and other opportunities. • Ensure that closure planning considerations address the re-skilling of employees for the downscaling, early closure and long-term closure scenarios. • Work together with communities to manage issues such as security.	Medium

vii) The outcome of the site selection Matrix. Final Site Layout Plan

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)

The final site layout plan will be described in the EIR / EMPR once all specialist studies have been completed and comments from I&APs have been received. In the absence of site specific specialist studies it is not possible to complete a site selection matrix at this stage. Please refer to Appendix D for a preliminary layout of the mining schedule for the extension of the underground mining area.

The positioning of the extension of the mining areas was informed by the position of the mineable resource and ensuring a feasible access point to the mineable resource. Thus no locational alternatives are considered in this EIA.

viii) Motivation where no alternative sites were considered

See section on alternatives

ix) Statement motivating the preferred site

(Provide a statement motivation the final site layout that is proposed)

The final site layout plan will be described in the EIR / EMPR once all specialist and engineering designs have been completed and comments from I&APs have been received. Please refer to Appendix D for a preliminary layout of the mining schedule for the extension of the underground mining area.

11. Plan of study for the Environmental Impact Assessment process

i. Description of alternatives to be considered including the option of not going ahead with the activity.

See section on alternatives for full description as discussed in this report.

The following alternatives were investigated as feasible alternatives:

- *The site on which the proposed underground mining sections are to be located (site and layout alternatives);*

The location of the proposed extension is adjacent to the current mining area and the existing decline shafts can be utilised to access the extension area. The feasibility studies and resources

planning has been completed and no alternative location will form part of the impact assessment phase.

- *The mining method (technology alternatives)*

The current mining method will be applied to the proposed extension area.

- *Design alternatives;*

The layout plans are based on the availability of resources and geological structures. Layout plans can be altered based on resources and geological information.

- Not implementing the mining activities (*No – Go alternative*).

This option will be discussed and assessed in further detail.

ii. Description of the aspects to be assessed as part of the environmental impact assessment process

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).

The following aspects will be assessed as part of the environmental assessment process for the current EMPr, historical specialist studies (existing studies) and specialist studies as identified in Table 25:

- Topography;
- Geology and Soils;
- Geohydrology;
- Hydrology;
- Climate;
- Biodiversity;
- Socio-economic;
- Dust fallout;
- Ambient noise levels;
- Financial Provision
- Aesthetic quality (visual); and
- Archaeological aspects.

iii. Description of aspects to be assessed by specialists

Table 25: Description of aspects to be assessed by specialists

Aspect	Specialist Study	Specialist	Terms of Reference
Extended mine area layout	Mine schedule and planning	Two Rivers Platinum – mine planning department	Mine Schedule - Production rates - Underground layout
Geohydrology	Geo-hydrological Study	Noa Agencies	The scope of work was to review available groundwater information from the previous studies and to compile a supporting specialist groundwater report for the expansion of the underground mine area, including: • Detailed site inspection for the mapping of relevant geo-hydrological features; • Data collection of existing information from topographical maps, ortho-photos, geological maps, hydrological information, meteorological information, previous groundwater studies in the area; • Meetings with relevant mine personnel; • Borehole/spring census in the area to assess groundwater utilisation by neighbours and their background water quality; • Evaluation of groundwater potential (quality & quantity); • Groundwater flow using MODFLOW and transport modelling using MODPATH or MT3D to predict the long-term impacts on the receiving environment; • Estimation of Inflows to the mines based on mining plans provided; • Assessment of the possible environmental impacts and to conceptualise mitigation measures; and • Recommendation for a groundwater monitoring network.

iv. Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

1. Steps to be taken to notify interested and affected parties

(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h) (ii) herein)

All registered interested and affected parties will personally be notified via email or message of the availability of the scoping report and EIA report including the venue and the period it will be available for.

A final EIA report including comments received during the I&AP review process will be prepared and submitted to the DMR for their review and decision-making. A site visit and meeting will be held, if requested.

f) NEXT PHASES OF THE PUBLIC PARTICIPATION PROCESS

1. Details of the engagement process to be followed

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and records of such consultation will be required in the EIA at a later stage)

During the EIA phase hardcopies and CDs of all reports and supporting documents will be submitted to the organs of state and relevant authorities. All the reports will be placed an area accessible to I&APs and will be available for Malan Scholes Consulting.

Engagement with interested and affected parties during the EIA phase will involve the following:

- All stakeholders and registered I&APs will have the opportunity to review and comment on all the documents released in the EIA phase. The EIA / EMPR report will be released for a period of 30 days for review and comment:
    - A hard copy of the report will be located at venues as specified.
    - Hard copies and CDs of the report will be submitted to all relevant organs of state; and
    - Digital copies can be provided via mail or other digital platforms (i.e. Dropbox)

- Should it be required, one on one or focus group meetings will be held with interested and affected parties.

2. Description of the information to be provided to Interested and Affected Parties

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land).

- The scoping report is herewith provided. The scoping report includes *inter alia* the site plan, a project description and typical impacts of each activity;
- The Environmental Impact Assessment Report will include *inter alia* findings of specialist studies and full assessment of all impacts of the alternatives, including cumulative impacts;
- The Environmental Management Programme to be made available, will include *inter alia* mitigation, management and monitoring measures to prevent and mitigate negative impacts and enhance positive impacts that have been identified in the EIA; roles and responsibilities and an environmental awareness plan.

v. Description of the tasks that will be undertaken during the environmental impact assessment process

A description of the tasks that would be undertaken during the EIA phase is provided below in Table 26. A preliminary schedule for the EIA phase that aligns with regulatory timeframes is included below.

Table 26: EIA Tasks and Timing

Phase	EAP activity	Opportunities for Consultation and Participation		Schedule *
		Competent Authorities	I&APs	
Specialist studies	EAP to manage specialist activities and receive inputs for EIA.	-	-	July – Sept 2018
EIA Phase	Compile EIA report	-	-	Aug – Sept 2018
	Distribute EIA for review	Provide copy to DMR for records	Review of EIA (30 days), Comments to EAP	Oct 2018
	I&AP consultations	-	Consultation with I&APs	

	Collate and respond to comments and finalise EIA report	-	-	November 2018
Competent authority review and decision making	EIA report to DMR (106 days from acceptance of Scoping report).	DMR Acknowledge Receipt of EIA (10 days).	Notify I&APs of final report submission	November - Dec 2018
		DMR Review (107 days)		
		Environmental Authorisation Granted / Refused		March – April 2019
Decision	Notify registered I&APs of decision (within 14 days of date of decision)	-	-	April 2019
Appeal Phase	EAP to provide information on appeal process as and when required.	Consultation during processing of appeal if relevant.	Submit appeal in terms of National Appeal Regulations, 2014	120 day process

- **Approach to the EIA**

An Environmental Impact Assessment (EIA) is a good planning tool. It identifies the environmental impacts of a proposed development and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

The EIA for this project will comply with the National Environmental Management Act (1998) (as amended) and the NEMA EIA Regulations (2014) [as amended] of the Department of Environmental Affairs (DEA). The guiding principles of an EIA are listed below.

- **Guiding principles for an EIA**

The EIA must take an open participatory approach throughout. This means that there should be no hidden agendas, no restrictions on the information collected during the process and an open-door policy by the proponent. Technical information must be communicated to stakeholders in a way that is understood by them and that enables them to meaningfully comment on the project.

There should be ongoing consultation with interested and affected parties representing all walks of life. Sufficient time for comment must be allowed. The opportunity for comment should be announced on an on-going basis. There should be opportunities for input by specialists and members of the public. Their contributions and issues should be considered when technical specialist studies are conducted and when decisions are made.

- **Information gathering**

Early in the EIA process, the Environmental Assessment Practitioner (EAP) identified the information that would be required for the impact assessment and the relevant data were obtained. In addition, available information about the receiving environment was gathered from reliable sources, interested and affected parties, previous documented studies in the area and previous EIA Reports. The project team then visited the site to gain first-hand information and an understanding of the existing operations and the proposed project.

- **Specialist Assessments**

Based on the impacts identified during the Scoping Phase, the following specialist studies have been identified to be completed and form part of the EIA. The main objective of the specialist studies is to provide independent scientifically sound information on issues of concern relating to the project proposal. The findings of the various specialist studies undertaken will be incorporated into the EIA Report. Any impacts that have not been identified during the scoping phase that have been identified and assessed by specialists will also be included in the environmental impact assessment.

- **Legislative Framework**

The legal requirements will be described and assessed in more detail.

- **Alternatives**

Current site alternatives and layouts and additional site and layout alternatives as identified by interested and affected parties, will further be assessed and a preferred alternative recommended.

- **Description and assessment of impacts identified during the scoping phase**

A comprehensive list of all impacts as identified by the EAP and the specialists, will be provided within the EIA report and assessed as per the methodology described in this report and plan of study.

- **Environmental management programme**

An Environmental Management Programme containing mitigation, management and monitoring measures and specifying roles and responsibilities will be compiled with specialist input.

- **Stakeholder engagement**

Registered interested and affected parties including relevant organs of state, will be consulted with during the EIA phase. All their comments will be formally responded to and incorporated into the EIA and the EIA report that will be submitted to the competent authority.

(ix) Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored

Table 27: Measures to avoid, reverse, mitigate or manage impacts and residual risk

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**POTENTIAL FOR RESIDUAL RISK**
Construction phase No construction phase is anticipated as the mine is operational and the existing underground mining section will be extended.	N/A	• N/A	N/A
Operational Phase: Extending of the underground mining sections (drilling, blasting and removal of rock). Loading, hauling and conveying of RoM to processing plant. Processing of RoM. Deposition of waste onto waste facilities and storage of waste. Maintenance of the waste rock dumps. Loading, hauling and off-loading of waste onto waste management facilities.	Soil erosion and soil compaction by heavy duty vehicles on site. Medium (-)	**Reduce and remedy through controlling management measures.** • The approved stormwater management plan must be implemented; • Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants; and • Soils compacted, should be deeply ripped at least to a depth of 300mm to loosen compacted layers and re-graded to even running levels.	Low (-)
	Contamination of soils. Medium (-)	**Prevent through controlling management measures.** • All vehicles and machinery will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks; • All leaks will be cleaned up immediately using an absorbent material and spill kits, in the prescribed manner; and • The approved Integrated Water and Waste Management Plan to be implemented. ***Hydrocarbons and hazardous waste*** • All hazardous waste generated shall be kept separate and shall not be mixed with general waste; and	Low (-)

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**POTENTIAL FOR RESIDUAL RISK**
		• All hazardous waste shall be stored within a sealed drum on an impermeable surfaced area within the central waste storage and transition area.	
	Stormwater, erosion and siltation impacts due to a lack of implementing measures to manage stormwater run-off quantity and quality during the operational phase. Medium (-)	**Reduce and remedy through controlling management measures.** • The Site Manager (SM) should ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater system; • Appropriate measures, e.g. erection of silt traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses should be taken; • No wastewater may run freely into any of the surrounding naturally vegetated areas; • The loss of topsoil must be minimised; • Erosion and subsequent siltation must be limited; • Any drainage channels shall be suitably designed to ensure that erosion does not occur; • All areas susceptible to erosion shall be protected and stabilisation measures implemented; • Packing of sandbags, gabions, straw bales or brush to reduce the speed of water flow where water is scouring the topsoil and results in the formation of erosion gullies; • Any surface runoff generated which has a high suspended solid content shall be collected at the point source in an appropriate containment facility, then be allowed to settle before discharge into the environment; and • A stormwater management plan must be compiled; and should be approved by DWS and implemented.	Low (-)
	Contamination of stormwater runoff and groundwater. Medium (-)	**Prevent through controlling management measures.** In accordance with Government Notice 704 (GN 704), the onsite management should: • Keep clean and dirty water separated; • Contain any dirty water within a system; and	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		• Prevent the contamination of clean water. In order to achieve these objectives, the following stormwater management measures must be implemented on the site to ensure that that potential stormwater impacts are kept to a minimum: • Clean and dirty stormwater needs to be separated. Dirty stormwater may not be released into the environment and should be contained and treated on site; • The operation and maintenance of the stormwater and waste water containment facilities shall be done in accordance with the requirements of the Integrated Water Use License and Integrated Water and Waste Management Plan (IWWMP); • All temporary storm water infrastructure (if any) on-site shall be maintained and kept clean throughout the construction period; • Immediate reporting of any polluting or potentially polluting incidents so that appropriate measures can be implemented; • Fuel and oil spills shall be treated immediately by appropriate mop-up products. Several hydrocarbon absorption/remediation products (i.e. Spill kits) must be placed throughout the site; • Use of bunds or traps to ensure full containment of hydrocarbon and other hazardous materials are mandatory; • Any contaminated material is disposed of in an appropriate manner and the potential risks associated with such spills are limited; • Stormwater leaving the site must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises; • All hazardous substances should be stored on impervious surfaces that allow for the containment of spills and leakages (e.g. bunded areas). Should spills occur, these should be reported to the Site Manager.	

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**POTENTIAL FOR RESIDUAL RISK**
		• Liquid hazardous waste shall be contained and stored according to the prescribed measures; • Increased runoff should be managed using berms and other suitable structures as required to ensure flow velocities are reduced; and • Removal of spills, rainwater and waste produced during clean-up of the bunds – shall be done in accordance to relevant specifications; and	
	Impacts of dewatering on the groundwater aquifer should water be abstracted from ground water during the operational phase. Medium (-)	**Prevent through controlling management measures.** • Water should be recycled to avoid any groundwater abstraction. No mitigation is possible for dewatering as the mine must be kept dry. Maintenance of water and waste management procedures to avoid contaminant seepage to groundwater. • Install flow meters to monitor the amount of water extracted from underground • Monitor of groundwater levels quarterly	High (-)
	Seepage from waste management facilities could cause a contamination plume affecting the underground water resources. Medium (-)	**Prevent through controlling management measures.** • Storage and classification of hazardous waste to be in accordance with the waste classification and management regulations GNR 634-635; • The footprint to be lined with a liner as determined by waste classification; and • Groundwater should be monitored on a quarterly basis to be able to detect any possible pollution caused by the waste management facilities. Should water quality deteriorate, mitigation measures as specified by a specialist shall be implemented.	Low (-)
	Disturbance and loss of fauna through noise, light and dust pollution and hunting, trapping and killing of fauna.	**Prevent or reduce through management measures.** • Environmental awareness training should include that no hunting, trapping or killing of fauna are allowed; • Any animals rescued or recovered will be relocated in suitable habitat away from the mining operations and associated infrastructure;	Very Low (-)

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**POTENTIAL FOR RESIDUAL RISK**
	Low (-)	• Any lizards, snakes or monitors encountered should be allowed to escape to suitable habitat away from disturbance. • No reptile should be intentionally killed, caught or collected during any phase of the project; and • General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.	
	Spreading of alien invasive species and bush encroachment of indigenous species. Medium (-)	**Prevent and control through management measures.** • An alien vegetation management plan should be drawn up and implemented; • Regular removal of invasive alien species should be undertaken. This should extend right through to the closure phase of the project; and • No spread of alien vegetation onto adjacent properties should be allowed. • Development of an alien invasive management plan.	Low (-)
	Possibility of mining activities and workers causing veld fires destroying veld and animals on the study area and on adjacent land, impacting on the livelihood of surrounding land owners and users. Medium (-)	**Prevent and control through management measures.** • All workers will be sensitised to the risk of fire; • Smoking is only allowed in designated smoking areas and dispose of cigarette butts safely in sand buckets; • The Applicant shall ensure that the basic fire-fighting equipment is available on the site; and • Extinguishers should be located outside hazardous materials and chemicals storage containers; Fire response and evacuation • An Emergency Plan (including Fire Protection, Response and Evacuation Plan) is to be prepared by the Applicant and conveyed to all staff on the site; and • Identify major risks to minimise the environmental impacts e.g. air pollution and contaminated effluent runoff.	Very Low (-)

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**POTENTIAL FOR RESIDUAL RISK**
	Visibility from sensitive receptors / visual scarring of the landscape and impact on 'Sense of Place' as a result of the visibility of the mining site including the waste management facilities. Medium (-)	**Reduce through management measures.** • The structures need to be constructed in such a way that they are stable. • The tailings dam side slopes will be vegetated in order to blend in with the surrounding environment and reduce the visual impact.	Low (-)
	Visibility of solid domestic and operational waste. Medium (-)	**Reduce and control through management measures.** • Housekeeping on site should be enforced.	Low (-)
	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the operation of the waste management facilities. Medium (-)	**Reduce and control through management measures.** • Vehicles will be regularly serviced to ensure acceptable noise levels are not exceeded. Silencers will be utilised where possible; • Heavy vehicle traffic should be routed away from noise sensitive areas, where possible; • Noise levels should be kept within acceptable limits. All noise and sounds generated should adhere to South African Bureau of Standards (SABS) specifications for maximum allowable noise levels for construction sites. No pure tone sirens or hooters may be utilised except where required in terms of SABS standards or in emergencies; • The Site Manager (SM) should take measures to discourage labourers from loitering in the area and causing noise disturbance; • Regular monitoring of noise levels at various, pre-determined locations. This will serve as the core of noise mitigation as it will enable the determination of problem areas; • Personal Protective Equipment to all persons working in areas where high levels of noise can be expected; Signs where it is compulsory; • Proper design of the plant areas and machinery where measures are taken to prevent noise generation such as silencers, mufflers and	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
		sound suppressing enclosures for parts/processes which can generate noise; and • Regular inspections and maintenance of equipment, vehicles and machinery to prevent unnecessary noise.	
	Disturbance due to vibrations caused by vehicles. Low (-)	**Reduce and control through management measures.** • All vehicles should be regularly serviced and maintained and kept in a good running condition; and • Adequate planning practices should be implemented to avoid any unnecessary trips made by heavy vehicles.	Very Low (-)
	Impact of security lighting on surrounding landowners and animals. Medium (-)	**Reduce and control through management measures.** • Unnecessary lights should be switched off during the day and / or night to avoid light pollution; • If lighting is required, the lighting will be located in such a place and such a manner so as to minimise any impact on the surround community; and • Security lighting should be designed in such a way as to minimise emissions onto undisturbed areas on site and neighbouring properties. Light fittings should face downwards.	Low (-)
	Increased dust pollution (soil and ore fines), vehicles on gravel roads and storage of tailings and waste rock, as well as mining activities. Low (-)	**Reduce and control through management measures.** • Dust suppression shall be implemented during dry periods and windy conditions; • Minimise travel speed on paved roads; • Implement and actively monitor dust fallout generated in the 8 major wind directions on the borders of the site; and • Implement monthly site inspection to check for possible areas of dust generation not addressed or not effectively managed.	Low (-)
	Increased windborne dust (soil and ore fines), vehicle fumes and particulate matter PM_{10}, altering air quality.	**Reduce and control through management measures.** Refer to mitigation measures above.	Low (-)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Medium (-)		
	Generation and disposal of additional general waste, litter and hazardous material during the operational phase and operational waste i.e. waste rock and tailings. Medium (-)	**Reduce and control through management measures.** • Mine management will draw up all rehabilitation plans. After the plans are approved by the competent authority, they will be implemented. Monitoring and modelling of the groundwater will continue until a closure certificate is issued; • The closure strategy will be re-assessed to determine containment, treatment and/or re-use options through the monitoring and calibration of the groundwater model during the operational phase;	Medium (-)
	Need for services e.g. water, electricity and sewerage systems, causing additional strain on natural resources and service infrastructure. Low (-)	**Reduce and control through management measures.** • Energy savings measures to be implemented at the mine, e.g.: ➢ No lights to be switched on unnecessarily. Only security lights to be switched on at night; • Energy saving bulbs to be installed; and • Water should be recycled as far as possible to avoid any additional water usage.	Very Low
	The change in the traffic patterns as a result of increased traffic entering and exiting the operations on the surrounding road infrastructure and existing traffic. Low (-)	**Reduce and control through management measures.** • Where feasible heavy vehicles should not operate on public roads during peak hours; and • Heavy vehicles should adhere to the speed limit of the road.	Very Low (-)
	Nuisance, health and safety risks caused by increased traffic on an adjacent to the study area including cars and heavy vehicles.	**Prevent through management measures.** • Drivers will be enforced to keep to set speed limits. • Trucks will be in a road-worthy condition. • Roads and intersections will be signposted clearly. Only main roads should be used;	Low (-)

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**POTENTIAL FOR RESIDUAL RISK**
	Medium (-)	• Where feasible vehicles should not operate on public roads during peak hours; • Vehicles should adhere to the speed limit of the road; • Heavy vehicles should always travel with their head lights switched on; • Heavy vehicles should not stop on the road to pick up hitchhikers – No stopping on the road approaching the mine will be allowed; • Single directional traffic shall be controlled through a stop-go system or any other appropriate traffic control method; • The mine shall be responsible for ensuring that suitable access is maintained for public traffic to all relevant businesses and properties; and • All traffic accommodation measures are to conform to the latest edition of the South African Road Signs Manual	
	Increased risk to public health and safety: Dangerous areas including the waste management facilities poses health risks and possible loss of life to mine workers and visitors to the site. Medium (-)	**Prevent through management measures.** • A health and safety plan in terms of the Mine Health and Safety Act (Act 29 of 1996) should be drawn up and implemented to ensure worker safety; • A health and safety control officer should monitor the implementation of the health and safety plan for the operational phase; • Regular health and safety audits should be conducted and documented; and a record of health and safety incidents should be kept on site and made available for inspection; • Any health and safety incidents should be reported to the Site Manager (SM) immediately; • First aid facilities should be available on site at all times; • Workers have the right to refuse work in unsafe conditions; and • Material stockpiles or stacks should be stable and well secured to avoid collapse and possible injury to site workers.	Low (-)
	Socio-economic impact on farmers, labourers and surrounding landowners and residents due to negative impacts on	**Reduce through management measures.**	Low (-)

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**POTENTIAL FOR RESIDUAL RISK**
	groundwater, dust pollution, noise pollution etc. Medium (-)	Refer to the above-mentioned mitigation measures for noise, dust and other environmental impacts.	
	Extended employment provision due to the establishment of additional life of mine. Extension of the current mining area High (+)	• Proceed with the proposed activity.	High (+)
	Sourcing supplies from local residents and businesses boosting the local economy for an extended period of time. Medium (+)	None	Medium (+)
	Increased risk to public and worker health and safety. Medium (-)	**Prevent through management measures.** • Access to the mining area and waste management facilities to be restricted; • Professional engineers will undertake monitoring of the stability of the mine residue deposits.	Low (-)
	Economic impact any public health and safety incident occur. Medium (-)	**Prevent through management measures.** Refer to the mitigation measures above.	Low (-)
Closure and Post-Closure Phases	Due to the closure phase overlapping with the operational phase, all of the impacts described above will be applicable to the closure phase as well.	Refer to the above mitigation measures for impacts during the operational phase.	Although it is expected that impacts can be mitigated to acceptable

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Very Low – High (-)		levels, there is still a low to medium overall risk for negative impacts on the bio-physical and socio-economic environment.
	Soil erosion Low (-)	**Prevent, reduce and remedy through management measures.** • The slopes of the tailings dam and berms will be benched and vegetated as soon as possible. The slopes will be seeded with the recommended seed mix at the onset of the wet season to reduce erosion by wind or water; • The side slopes of tailings dam will be vegetated concurrent with its development. After closure, the surface of the tailings dam will be top soiled to a thickness of at least 300mm. The surface area will be re-vegetated with the recommended seed mix; • During decommissioning, the waste rock dump will be capped by placing of a 300 mm clay layer over shaped areas. This will reduce infiltration of surface water into the dump and will reduce shaping and closure costs of the dump at mine closure; and • Mine management will draw up all rehabilitation plans. After the plans are approved by the competent authority, they will be implemented.	Low (-)
	Seepage from waste management facilities could cause a contamination plume affecting the underground water resources.	**Prevent through management measures.** • Storage and classification of hazardous waste to be in accordance with the waste classification and management regulations GNR 634-635;	Low (-)

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**POTENTIAL FOR RESIDUAL RISK**
	High (-)	• The footprint to be lined with a liner as determined by waste classification; and • Groundwater should be monitored on a quarterly basis to be able to detect any possible pollution caused by waste management facilities. Should water quality deteriorate, mitigation measures as specified by a specialist shall be implemented.	
	Ground water pollution Medium (-)	**Prevent through management measures.** • Mine management will draw up all rehabilitation plans. After the plans are approved by the competent authority, they will be implemented. Monitoring and modelling of the groundwater will continue until a closure certificate is issued; • The closure strategy will be re-assessed to determine containment, treatment and/or re-use options through the monitoring and calibration of the groundwater model during the operational phase; and • Should monitoring results indicate the formation and movement of a pollution plume in the aquifer, management, containment or treatment measures will be implemented to prevent impact on the receiving surface water and groundwater environment.	Low (-)
	Generation and disposal of additional hazardous operational waste i.e. waste rock and tailings. Medium (-)	**Reduce and control through management measures.** • Refer to the above-mentioned mitigation measures.	Low (-)

12. Other Information required by the competent Authority

i) Compliance with the provisions of sections 24 (4) (a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998) the EIA report must include the: -

(1) Impact on the socio-economic conditions of any directly affected person

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix 2.19.1 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12. herein).

A Social and Labour Plan (SLP) have been developed for the TRP mine.

2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

Not applicable to this application.

13. Other matters required in terms of sections 24 (4) (a) and (b) of the Act

(The EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24 (4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix D).

Not applicable to this application.

UNDERTAKINGS BY THE EAP

I, DuToit Wilken, the Environmental Assessment Practitioner responsible for compiling this report, undertake that:

- the information provided herein is correct
- the comments and inputs from stakeholders and I&APs have been correctly recorded, although due to the volume of comments and objections received from I&APs, it's possible that not all the information has been included.
- information and responses provided to stakeholders and I&APs by the EAP is correct to the best of MSC's knowledge at the time of compiling the report
- the level of agreement with I&APs and stakeholders has been correctly recorded and reported.

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Signature of the EAP

DATE:

-END-

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