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Environmental Impact Assessment
And
Environmental Management Plan
Addendum Report

for Amendments to Licenced Activities Associated with the Platreef Underground Mine, near Mokopane, Limpopo Province

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 2008) (NEMA) AND THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO. 59 OF 2008) (NEM:WA) IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT NO. 28 of 2008) AS AMENDED (MPRDA).

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This document has been prepared by Digby Wells Environmental.

Report Type:	**EIA and EMP Addendum Report**
Project Name:	**Environmental Impact Assessment and Environmental Management Programme Addendum Report for the Platreef Underground Mine, Mokopane**
Project Code:	**IVA3396**

Name	Responsibility	Signature	Date
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This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.

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 a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

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

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process: -

- determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- determine the: -
  - nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
  - degree to which these impacts: -
    - can be reversed;
    - may cause irreplaceable loss of resources, and
    - can be avoided, managed or mitigated.
- identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- identify suitable measures to manage, avoid or mitigate identified impacts; and
- identify residual risks that need to be managed and monitored.

EXECUTIVE SUMMARY

Introduction

Digby Wells Environmental (hereafter Digby Wells) has been appointed by Ivanplats (Pty) Ltd (hereafter Ivanplats), as the independent Environmental Assessment Practitioner (EAP) to conduct an Addendum Environmental Impact Assessment (EIA) and update their Environmental Management Programme Report (EMP) and associated specialist studies for the proposed Platreef Underground Mining Project (hereafter the Project) near Mokopane, Limpopo.

Digby Wells Environmental undertook the necessary Environmental Impact Assessment (EIA) for the Project in 2012. To date, Ivanplats was granted the following licences/authorisations:

- Environmental Authorisation (EA) dated 27 June 2014 with reference 12/1/9/2-W32 issued by the Limpopo Department of Economic Development, Environment and Tourism (LEDET). Subsequent to this, Ivanplats had applied for and was also issued with the following EA Amendments:
  - EA Amendment (19 August 2014) relating to minor amendments of the conditions of approval; and
  - EA Amendment (30 July 2015) relating to the change of location of the Tailings Storage Facility (TSF) from the Turfspruit Farm to the Rietfontein Farm.
- Mining Right (MR) dated 04 November 2014 with reference LP30/5/2/2/1/10067MR granted by the Department of Mineral Resources (DMR); and
- Waste Management Licence (WML) dated 13 March 2015 with reference 12/9/11/L1224/5 issued by the National Department of Environmental Affairs (DEA).

Ivanplats has submitted a Bulk Sample Water Use Licence Application (WULA) to the Department of Water and Sanitation (DWS) and is still to submit the WULA for the overall Platreef Project to the DWS. The submission of the Project WULA to DWS is dependent on the granting of the Bulk Sample WULA.

Ivanplats is now proposing an amendment to its approved mine infrastructure area to accommodate surrounding communities that have moved closer to the infrastructure area boundary. Furthermore, Ivanplats has also proposed a restructure of the mine layout to optimise mining operations on the reduced infrastructure footprint.

The purpose of this Report is to describe and assess the environmental impacts of the proposed reduced infrastructure footprint and resultant layout amendments only and does not deal with the existing, authorised mining activities. However, for the purposes of holistic understanding of the mine elements of the existing approved EIA/EMP, where relevant, are included.

Project Applicant

The Applicant details are set out in the table below.

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Project Overview

The proposed Project site is located approximately 8 km northwest of the town of Mokopane which is situated in the magisterial district of the Mogalakwena Local Municipality and within the Waterberg District Municipality. Ivanplats plans to mine Platinum and other Platinum Group Metals (PGMs) such as Palladium (Pd); Rhodium (Rh); Iridium (Ir); Ruthenium (Ru); and Osmium (Os) with the Life of Mine (LoM) expected to be 30 years with the potential to extend this period by another 30 years.

An underground mine is planned and the Project aims to make use of the sublevel blast hole stoping method for mining the target Platinum Group Metals (PGMs). Ivanplats has commenced with the sinking of Shaft No. 1. In addition, certain mine infrastructure has been established to support the sinking of Shaft No. 1, including the mine's access road, a mine boundary fence and temporary facilities such as workshops and offices.

The Project is accessible all year-round by the N11 national highway, and a developed rail network goes through Mokopane, the closest railhead to the Project. A large, unskilled labour force lives in urban areas and farms around the proposed study area.

Scope of Amendment

During the site establishment phase of the Project, the communities surrounding the approved mine infrastructure area had commenced with the establishment of residential plots within and in close proximity to this approved infrastructure area. The Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities established plots along the western and southern boundaries of this mine infrastructure area whilst the Ga-Magongoa, Baloi and Macheke communities have established plots along the eastern boundary.

The approved mine infrastructure layout had an approved footprint of 420 hectares (ha), the close proximity of the communities has however resulted in the reduction of area available for the development of mine infrastructure. It is estimated that the footprint of the mine infrastructure area has been reduced by 74 ha, thus only leaving 346 ha available for the development of the mine. As a result of this footprint reduction, Ivanplats has reviewed the approved mine layout to ensure an optimum use of the reduced footprint. In particular, the footprint and/or position of certain activities/infrastructure required amendment.

Any change to the approved mine layout necessitates the requirement for an amendment to the relevant licences, in this case the Environmental Authorisation (12/1/9/2-W32), in terms of Regulation 31 of the Environmental Impact Assessment (EIA) Regulations, 2014 and the Mining Right (LP30/5/2/2/1/10067MR) in terms of Section 102 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

Further to these amendments, Ivanplats is also currently undertaking a Definitive Feasibility Study which has resulted in the addition of required and key structures on the approved mine layout plan. It should be noted that these additional structures do not constitute new listed activities in terms of the EIA Regulations 2014 as all Project related activities have either been approved in terms of the EIA Regulations, 2010 or do not trigger the relevant thresholds in the EIA Regulations, 2014. Ivanplats intends to apply for an environmental authorisation in terms of Section 24 of NEMA for the list of activity amendments set out below. The list of activity amendments Ivanplats intends to apply for an environmental authorising for in terms of Section 24 of NEMA are listed below:

- Headgear of Shaft No. 2 increased in height from 45 m to 96 m high;
- One additional production shaft (i.e. Shaft No. 2) and three vent raises (positions of these vent raises have been amended);
- Road alignments of access and internal mine roads have been amended and new maintenance roads included;
- Inclusion of distribution power lines and substations (< 33 kV);
- Inclusion of diesel generators (<10 MW);
- Inclusion of above-ground Waste Rock Crusher/s;
- Waste Rock Stockpile increased in height from 17 m to 25 m high;
- Separation of the Ore Stockpile into High Grade and Low Grade Ore and an increase in height from 8 m to 25 m high;
- Amendment to water management infrastructure:
    - Two attenuation ponds to collect clean water runoff
    - One stormwater pond to collect dirty water runoff
    - Two raw water dams
    - Inclusion of mine dirty water storage dam

- Inclusion of clear water storage dam
- Inclusion of a stormwater drain from the Project site to the downstream water resources

- Realignment of a section of the Tailings Storage Facility (TSF) pipeline; and
- Re-positioning of waste management infrastructure: Sewage Treatment Plant, Leachate Pond, Composting Facility, Material Recovery Facility (MRF), Tyre Storage Area, Salvage Yard and Landfill.

It should however be noted that the following proposed developments which Ivanplats are currently still investigating may be subject to a separate EIA/amendment process and has not been dealt with as part of this EIA Addendum Report:

- Once the mining of each stope is completed, Ivanplats are proposing to backfill these stopes with a combination of cemented rock fill and paste fill. It should be noted that this activity of backfilling was not comprehensively addressed as part of the previous EIA process undertaken in 2013. This EIA Addendum Report also does not deal with the proposed backfilling activity as it triggers the requirement for a new WML, hence a new EIA process will need to be conducted. This will be applied for by Ivanplats at a later stage;
- Ivanplats is also currently investigating the potential of renewable energy (i.e. solar photovoltaic (PV)) to reduce the reliance on the national grid. Ivanplats are investigating options for siting, capacity and design of such a facility. This development may trigger a separate EIA process;
- Agreements with Eskom were made to provide a temporary supply of a 5 MVA overhead power lines to support the power requirements during any future construction activities for the Project. Associated with these power lines, a temporary substation (5 MVA) and a permanent substation (70 MVA) will be established. These facilities are assumed to have been authorised through a separate EIA process undertaken by Eskom;
- The change in position of the waste management infrastructure is being addressed through a separate WML Variation Application undertaken by Golder Associates Africa (Pty) Ltd (GAA) and was submitted to the DMR separately; and
- Ivanplats has submitted a Water Use Licence Application (WULA) to the Department of Water and Sanitation (DWS) relating to their Bulk Sample Shaft (BSS) operations, and is still to submit the IWULA for the entire Platreef Project to the DWS. The date for submission of the Platreef Project IWULA is dependent on the granting of the BSS WULA and will be confirmed with the DMR at a later stage.

An Amendment Application Process will be undertaken to address the Project modifications. This EIA Addendum Report serves to:

- Provide an updated mine layout and description of the amended Project components;
- Identify and assess the potential impacts and risks associated with the Project amendments; and
- Provide further recommendations on the mitigation measures and action plans proposed based on the Project amendments.

The following specialist studies have been conducted as part of this addendum EIA/EMP report:

- Air Quality Assessment;
- Visual Assessment;
- Noise Assessment;
- Heritage Impact Assessment;
- Rehabilitation Plan; and
- Closure Cost Assessment.

Digby Wells Environmental has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the amendment application.

As part of the amendment application, a public participation process (PPP) was undertaken. In particular, project stakeholders were informed of the proposed amendments via SMS, email, site notices, advertisements, meetings and dissemination of information in the public domain.

Conclusion

As a result of communities proximity to the mine's infrastructure area, Ivanplats has proposed a reduction to the footprint area and subsequently restructure the mine layout to ensure optimum use of the reduced space. These amendments not only benefit the mine's productivity but were also investigated considering the health and safety of surrounding communities.

The findings of the impact assessment have shown that the proposed Project may result in certain negative impacts to the environment; however, adequate mitigations measures have been included into the EMP Report to reduce the significance of all the identified negative impacts. Most negative impacts (minor and moderate) can be reduced through the implementation of mitigation measures. By reducing the mine's footprint area and subsequent infrastructure layout, Ivanplats can ensure the optimum operation of the Project as well as manage the impacts to the surrounding communities. It is recommended that the amendment be granted for Ivanplats to continue with the mining operations at Platreef Mine.

Table 1-1: Summary of Project Amendment Impacts

Potential Impact	Aspects Affected	Phase	Significance	Significance (Post Mitigation)
Dust generation	Air Quality	Construction	Negligible (negative) – 35	Negligible (negative) – 21
Reduction in air quality	Air Quality	Construction	Minor (negative) – 42	Negligible (negative) – 12
Reduction in air quality due to gaseous emissions	Air Quality	Construction	Moderate (negative) – 77	Negligible (negative) – 24
Airborne dust leads to reduced air quality	Air Quality	Operational	Moderate (negative) – 84	Negligible (negative) – 27
Reduction in the quality of air	Air Quality	Operational	Moderate (negative) – 105	Negligible (negative) – 30
Reduction in the quality of air	Air Quality	Operational	Moderate (negative) – 78	Negligible (negative) – 30
Reduction in the quality of air	Air Quality	Operational	Minor (negative) – 45	Negligible (negative) – 27
Reduction in air quality due to gaseous emissions	Air Quality	Operational	Moderate (negative) – 91	Negligible (negative) – 30
Reduce air quality due to dust emission	Air Quality	Decommissioning	Negligible (negative) – 24	Negligible (negative) – 18
Reduction in air quality	Air Quality	Decommissioning	Minor (negative) – 45	Negligible negative) – 18
Physical changes to burial grounds and graves	Cultural Heritage	Construction	Major - negative (-140)	Moderate - negative (-78)
Intangible Impacts to Burial Grounds and Graves	Cultural Heritage	Construction, Operational and Decommissioning	Moderate - negative (-80)	Significance: Moderate - positive (75)
Noise will emanate from the machinery and vehicles	Ambient Noise	Construction	Minor (negative) – 66	Minor (negative) – 36
Noise from the machinery and vehicles operating crushing circuit, hauling of ore on surface, continuous stockpiling and shaping of waste rock dump and over burden stockpiles as well the use of generators	Ambient Noise	Operation	Moderate (negative) – 78	Minor (negative) – 44

Potential Impact	Aspects Affected	Phase	Significance	Significance (Post Mitigation)
Noise from the machinery and vehicles	Ambient Noise	Decommissioning	Negligible (negative) – 21	Negligible (negative) – 14
The change of land use from agriculture to mining will have a negative visual impact	Visual	Construction	Moderate negative (-105)	Moderate negative (-98)
Infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas	Visual	Construction	Minor negative (-70)	Minor negative (-63)
Drilling and blasting for shafts and vent raises will have a negative visual impact. Dust from blasting will also have a negative visual impact.	Visual	Construction	Minor negative (-63)	Minor negative (-48)
The construction of the headgear and associated shaft infrastructure will have a negative visual impact on the receiving environment	Visual	Construction	Moderate negative (-91)	Moderate negative (-84)
The construction of surface infrastructure will have a negative visual impact on the receiving environment	Visual	Construction	Moderate negative (-77)	Minor negative (-63)
Dust from the waste rock crusher and mine crushers will also have a negative visual impact.	Visual	Operational	Minor negative (-45)	Negligible negative (-32)
Dust from vehicular activity will also have a negative visual impact	Visual	Operational	Minor negative (-45)	Minor negative (-36)
Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade	Visual	Operational	Major negative (-112)	Moderate negative (-105)

Potential Impact	Aspects Affected	Phase	Significance	Significance (Post Mitigation)
ore stockpile will have a negative visual impact. Dust from the stockpiles will also have a negative visual impact				
Operation of the production shafts will have a negative visual impact. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact.	Visual	Operational	Minor negative (-66)	Minor negative (-50)
Demolition and removal of infrastructure will have a minor negative visual impact	Visual	Decommissioning	Minor negative (-56)	Minor negative (-42)
Rehabilitation of disturbed areas will have a minor negative visual impact	Visual	Decommissioning	Minor negative (-63)	Minor negative (-48)
Sealing of shafts will have a negative visual impact on the receiving environment.	Visual	Decommissioning	Minor negative (-42)	Negligible negative (-30)

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LIST OF ACRONYMS AND TERMS

µg/m^3	Micro grams per cubic meter
Al	Aluminium
AMD	Acid Mine Drainage
AQIA	Air Quality Impact Assessment
BBBEE	Broad Based Black Economic Empowerment
BIC	Bushveld Indigenous Complex
CA	Competent Authority
CBD	Central Business District
CRR	Comment and Response Report
CSR	Corporate Social Responsibility
dBAba	Unit of sound level. The weighted sound pressure level by the use of the A metering characteristic, which allows the sound pressure level to be measured at the approximate sensitivity as the human ear
DEA	Department of Environmental Affairs
Digby Wells	Digby Wells Environmental
DM	District Municipality
DMR	Department of Mineral Resources
DO	Dissolved Oxygen
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act, 1989 (Act No. 73 of 1989)
ECO	Environmental Control Officer
ED	Enterprise Development
EE	Employment Equity
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
EP	Equator Principles
ESA	Early Stone Age
FEL	Front End Loader
GDP	Gross Domestic Product

GIS	Geographic Information System
GN R.	Government Notice Regulation
GPS	Geographical Positioning System
GRP	Grave Relocation Plan
Ha	Hectares
HDPE	High Density Polyethylene
HDSAs	Historically Disadvantaged South Africans
HIA	Heritage Impact Assessment
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
I&APs	Interested and Affected Parties
IBA	Important Bird Area
IDP	Integrated Development Plan
IFC	International Finance Corporation
IHAS	Invertebrate Habitat Assessment System
IHI	Index of Habitat Integrity
Ir	Iridium
IUCN	International Union for Conservation of Nature
IWUL	Integrated Water Use License
IWULA	Integrated Water Use License Application
JWF	Joint Water Forum
kg	Kilogram
km	Kilometre
km^2	Square Kilometre
$L_{Aeq,T}$	Is the value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T_m, has the same mean-square sound pressure as a sound under consideration whose level varies with time.
LAN	Limestone Ammonium Nitrate
LC	Least Concern
LED	Local Economic Development
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LEGDP	Limpopo Economic Growth Development Plan

LEMA	Limpopo Environmental Management Act, 2003
LHD	Load-Haul-Dumper
LIHRA	Limpopo Heritage Resource Authority
LM	Local Municipality
LoM	Life of Mine
LSA	Later Stone Age
m	Metre
m^2	Square Meter
mamsl	Meters Above Mean Sea Level
Mg/m^2	Milligrams per square meter
MIRAI	Macro-invertebrate Response Assessment Index
MLM	Mogalakwena Local Municipality
mm	Millimetres
MPRDA	The Minerals and Petroleum Development Act, 2002 (Act No. 28 of 2002)
MRA	Mining Right Area
N11	National Highway No. 11
NAAQS	National Ambient Air Quality Standards
NBSAP	National Biodiversity Strategy and Acton Plan
NEM:AQA	National Environment Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEMA	The National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act , 2004 (Act No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFAQM	National Framework for Air Quality Management
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act, 1999 (Act No.25 of 1999)
NID	Notice of Intent to Develop
No.	Number
NPAES	National Protected Areas Expansion Strategy
NQF	National Qualifications Framework

NWA	National Water Act, 1998 (Act No. 36 of 1998)
Os	Osmium
Pd	Palladium
PGM	Platinum Group Metals
PM_{10}	Particulate Matter less than 10 microns in diameter
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
PPP	Public Participation Process
Project	Platreef Underground Platinum Mine
PS	Performance Standards
Pt	Platinum
Rh	Rhodium
ROM	Run of Mine
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SMME	Small, Medium and Micro-sized Enterprises
SoW	Scope of Work
StatsSA	Statistics South Africa
STI	Sexually Transmitted Infections
ToR	Terms of Reference
TSF	Tailings Storage Facility
WBPA	Waterberg-Bojanala Priority Area
WDM	Waterberg District Municipality
WMA	Water Management Area
WRB	Waste Rock Berm
WRD	Waste Rock Dump
WULA	Water Use Licence Application

Part A: Scope of Assessment and Environmental Impact Assessment Report

1 Introduction

Ivanplats (Pty) Ltd (hereafter Ivanplats) wishes to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (the Project). Digby Wells Environmental undertook the necessary Environmental Impact Assessment (EIA) for the Project in 2012. Ivanplats was subsequently granted the following licences/authorisations:

- Environmental Authorisation (EA) dated 27 June 2014 with reference 12/1/9/2-W32 issued by the Limpopo Department of Economic Development, Environment and Tourism (LEDET). Subsequent to this, Ivanplats had applied for and was also issued with the following EA Amendments:
  - EA Amendment (19 August 2014) relating to minor amendments of the conditions of approval; and
  - EA Amendment (30 July 2015) relating to the change of location of the Tailings Storage Facility (TSF) from the Turfspruit Farm to the Rietfontein Farm.
- Mining Right (MR) dated 04 November 2014 with reference LP30/5/2/2/1/10067MR granted by the Department of Mineral Resources (DMR); and
- Waste Management Licence (WML) dated 13 March 2015 with reference 12/9/11/L1224/5 issued by the National Department of Environmental Affairs (DEA).

The change in position of the waste management infrastructure is being addressed through a separate WML Variation Application undertaken by Golder Associates Africa (Pty) Ltd (GAA) and was separately submitted to the DMR recently. Ivanplats has submitted a Water Use Licence Application (WULA) to the Department of Water and Sanitation (DWS) relating to their Bulk Sample Shaft (BSS) operations, and is still to submit the IWULA for the entire Platreef Project to the DWS. The date for submission of the Platreef Project IWULA is dependent on the granting of the BSS WULA and will be confirmed with the DMR at a later stage.

Since the granting of the above-mentioned licences, Ivanplats has commenced with the sinking of Shaft No. 1. In addition, certain mine infrastructure has been established to support the sinking of Shaft No. 1, including the mine's access road, a mine boundary fence and temporary facilities such as workshops and offices.

During the site establishment phase of the Project, the communities surrounding the approved mine infrastructure area had commenced with the establishment of residential plots within and in close proximity to this approved infrastructure area. The Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities established plots along the western and southern boundaries of this mine infrastructure area whilst the Ga-Magongoa, Baloi and Macheke communities have established plots along the eastern boundary.

The approved mine infrastructure layout had an approved footprint of 420 hectares (ha), the proximity of the communities has however resulted in the reduction of area available for the development of mine infrastructure. It is estimated that the footprint of the mine infrastructure area has been reduced by 74 ha, thus only leaving 346 ha available for the development of the mine. As a result of this footprint reduction, Ivanplats has reviewed the approved mine layout to ensure an optimum use of the reduced footprint. In particular, the footprint and/or position of certain activities/infrastructure required amendment.

Any change to the approved mine layout necessitates the requirement for an amendment to the relevant licences, in this case the Environmental Authorisation (12/1/9/2-W32), in terms of Regulation 31 of the Environmental Impact Assessment (EIA) Regulations, 2014 and the Mining Right (LP30/5/2/2/1/10067MR) in terms of Section 102 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

Further to these amendments, Ivanplats is also currently undertaking a Definitive Feasibility Study which has resulted in the addition of required and key structures on the approved mine layout plan. It should be noted that these additional structures included in this application do not constitute new listed activities in terms of the EIA Regulations 2014 as all Project related activities have either been approved in terms of the EIA Regulations, 2010 or do not trigger the relevant thresholds in the EIA Regulations, 2014. It should however also be noted this EIA Addendum Report does not deal with the proposed backfilling activity as it triggers the requirement for a new WML, hence a new EIA process will need to be conducted. This will be applied for by Ivanplats at a later stage.

An Amendment Application Process will be undertaken to address the Project amendments. This EIA Addendum Report serves to:

- Provide an updated mine layout and description of the amended Project components;
- Identify and assess the potential impacts and risks associated with the Project amendments; and
- Provide further recommendations on the mitigation measures and action plans proposed based on the Project amendments.

2 Item 3: Contact Details

The project applicant's details are set out in the table below.

Table 2-1: Contact Details of the Project Applicant

Company name:	Ivanplats (Pty) Ltd
Contact person:	Mr. Gerick Mouton
Physical address:	2nd Floor, 82 on Maude Street, Sandton, 2146
Telephone:	+27 11 088 4300
Cellphone:	+27 83 708 0999
Email:	gerickm@ivanplats.com

2.1 Item 3(a)(i): Details of the EAP

Digby Wells Environmental (Digby Wells) is a South African company with international expertise in providing Environmental and Social services to South African as well as international clients, with the focus predominantly on the Mineral Resources and Energy sectors in Africa. Please refer to Table 2-2 below for the contact details of the Environmental Assessment Practitioner (EAP).

Table 2-2: Contact details of the EAP

Name of Practitioner:	Kasantha Moodley
Telephone:	+27 11 789 9495
Fax:	+27 11 789 9498
Email:	kasantha.moodley@digbywells.com

2.2 Item 3(a)(ii): Expertise of the EAP

2.2.1 The Qualifications of the EAP

Kasantha has completed the following qualifications:

- Bachelor of Science (BSc) Honours – University of Witwatersrand (2012); and
- Bachelor of Science (BSc) – University of KwaZulu Natal (2008)

Please find Kasantha's qualification attached as Appendix A.

2.2.2 Summary of the EAP's Past Experience

Kasantha Moodley currently holds the position of Senior Environmental Consultant within the Environmental and Legal Services Department at Digby Wells Environmental. She has been with Digby Wells for almost 2 years and is responsible for managing several integrated environmental regulatory processes. Prior to Digby Wells, Kasantha Moodley spent 4 years with Environmental Resources Management Southern Africa (Pty) Ltd as a project manager. She has also spent 1 year at Arup Consulting Engineers and a further 2 years at GIBB (consulting) as a project consultant. Kasantha Moodley has a combined professional experience of almost 9 years in environmental assessment and planning and project management.

Kasantha Moodley has therefore been involved in several EIAs within various sectors including infrastructure, manufacturing, mining, oil and gas, and energy. Of particular relevance to this Project, Kasantha Moodley has just completed an EIA for a greenfields open pit coal mine in Gauteng.

Refer to Appendix A for Kasantha Moodley's CV.

3 Item 3(b): Description of the Property

The Project is located approximately 280 km northeast of Johannesburg and 8 km northwest of the town of Mokopane in Limpopo Province of South Africa (Plan 1– Appendix B). The Project properties include the farms Macalacaskop 243 KR and Turfspruit 241 KR with the construction of the approved Tailings Storage Facility (TSF) on the farm Rietfontein 2 KS.

These farms are located in the Waterberg District Municipality (WDM) and Mogalakwena Local Municipality (MLM). MLM is divided into 31 wards of which the directly affected villages fall within wards 20 to 24. These wards fall within the jurisdiction of the Mokopane Traditional Authority (TA). The property details as required are presented in Table 3-1 below.

Table 3-1: Property Details

Farm Name:	The Platreef Project is located on three adjacent farms, namely: ▪ Turfspruit 241 KR ▪ Macalacaskop 243 KR ▪ RE of Farm Rietfontein 2 KS
Application Area (Ha):	The approved Mining Right Area is 7841.265 Hectares (Ha) The total area to be utilised for the Project's infrastructure is 345.3 Ha
Magisterial District:	Mogalakwena Local Municipality (MLM) within the Waterberg District Municipality (WDM)
Distance and direction from nearest town:	Approximately 8 km northwest of the town of Mokopane

21 digit Surveyor General Code for each farm portion:	**Farm**	**21 digit SG code**
	Turfspruit 241 KR	T0KR00000000024100000
	Macalacaskop 243 KR	T0KR00000000024300000
	RE of Farm Rietfontein 2 KS	T0KR00000000000200000

4 Item 3(c): Locality Map

A Locality Plan has been attached as Appendix B (Plan 2).

5 Item 3(d): Description of the Scope of the Proposed Overall Activity

A plan of the project site and updated infrastructure layout has been attached as Appendix B (Plan 3). The proposed project amendments are discussed in the sections below.

5.1 Item 3(d)(i): Listed and Specified Activities

The Project's activities and infrastructure that are proposed to be amended are listed in Table 5-1 below. The volumes, footprints, positioning and/or heights of the infrastructure listed below have been amended to accommodate the reduced footprint of the mine infrastructure layout. In addition, further detail on the infrastructure has been made available during the Definitive Feasibility Study, currently being undertaken, therefore there are additional activities/project components, which were not included in the EIA Process undertaken during 2013. These activities/project components have now been included in Table 5-1.

It should however be noted that these activity amendments do not constitute new listed activities in terms of the EIA Regulations, 2014. All activities listed in Table 5-1 have been approved in terms of the EIA Regulations, 2010 or do not trigger the relevant thresholds in the EIA Regulations, 2014 to require a new EIA process. Thus an Amendment Application Process is being undertaken to address the Project amendments.

Table 5-1: Amended Project Activities

Name of Activity	Aerial extent of the activity	Listed Activity	Applicable Listing Notice
Headgear increased in height from 45 m to 96 m high	Shaft No. 2 = 525 m²	All activities listed have been authorised in terms of the EIA Regulations,2010	Not applicable, as there are no activities triggered in terms of the EIA Regulations, 2014
One additional production shaft (i.e. Shaft No. 2) and three vent raises (positions of these vent raises have been amended)	Shaft No. 2 = 525 m² Vent Raise 1 = 88 m² Vent Raise 2 = 28 m² Vent Raise 3 = 28 m²		
Road alignments of access and internal mine roads have been amended and new maintenance roads included	Mine Road = 20.53 ha Service Road = 1.82 ha		
Inclusion of distribution power-lines and substations (< 33 kV)	Power-line Servitude = 20.17 ha Combined footprint for substations = 1.3 ha		
Inclusion of diesel generators (<10 MW)	0.96 ha		
Inclusion of above-ground Waste Rock Crusher/s	563 m²		
Waste Rock Stockpile increased in height from 17 m to 25 m high	Waste Rock Stockpile = 27.65 ha CRF Crushed Rock Stockpile = 1.16 ha		
Separation of the Ore Stockpile into High Grade and Low Grade Ore and increase in height from 8 m to 25 m high	High Grade Ore Stockpile = 5.56 ha Low Grade Ore Stockpile = 15.54 ha		
Amendment to water management infrastructure: ▪ Two attenuation ponds to collect clean water runoff ▪ One stormwater pond to collect dirty water runoff ▪ Two raw water dams ▪ Inclusion of mine dirty water storage dam ▪ Inclusion of clear water storage dam	Attenuation Pond 1 = 8.74 ha Attenuation Pond 2 = 8.17 ha Stormwater Pond = 9.0 ha Raw Water Dam 1 = 2.98 ha Raw Water Dam 2 = 2.9 ha Mine Dirty Water Storage Dam = 0.79 ha Clear Water Storage Dam = 0.2 ha		
Inclusion of a stormwater drain from the Project site to the downstream water resources	Stormwater Drain Servitude = 9.77 ha		
Realignment of a section of the Tailings Storage Facility (TSF) pipeline	TSF Pipeline Servitude (Amended) = 22.06 ha		
Re-positioning of waste management infrastructure: Sewage Treatment Plant, Leachate Pond, Composting Facility, Material Recovery Facility (MRF), Tyre Storage Area, Salvage Yard and Landfill.	Sewage Treatment Plant = 0.34 ha Leachate Pond = 0.3 ha Composting Facility = 0.34 ha Material Recovery Facility (MRF) = 0.13 ha Tyre Storage Yard = 0.94 ha Salvage Yard = 0.81 ha Landfill = 1.96 ha Landfill Cover Material = 0.57 ha		

Name of Activity	Aerial extent of the activity	Listed Activity	Applicable Listing Notice
Blasting – Condition 32 of the Environmental Authorisation granted in 2014 states that a 500 m safe blasting distance from the boundaries of the communities affected must be observed. The amendment of this condition is requested due to the following reasons: As stated above, during the site establishment phase of the Platreef Project, the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities established residential plots in close proximity to the proposed mine infrastructure area. The approved mine infrastructure layout had a total footprint area of 420 hectares (ha), which has now been reduced to 346 ha due to these encroachments. Please refer to Appendix 4 for a Comparative Layout/Footprint of the mine infrastructure area in 2013 compared to 2016. There a vast number of households now located along the western and southern boundaries of the mine infrastructure area. The current blasting procedures employed for the project include the mining standard of a 500 m radius safe blasting distance from the communities. This may however be a concern for structures such as the stormwater pond located on the south-western corner of the mine infrastructure area. Blasting will be required to establish this pond in this area, however the 500 m safe blast distance cannot be adhered to due to the close proximity of the communities. The blasting design/method will be developed to reduce the volume and extent of fly rock. Furthermore, Ivanplats will undertake a Safety Risk Assessment to determine the risks to the surrounding communities; this will be submitted to the Chief Inspectorate of Mines for review and approval.	N/A		
Demolition and removal of all infrastructure	345 ha		
Mine rehabilitation and sealing shafts	345 ha		

The change in position of the waste management infrastructure is being addressed through a separate WML Variation Application undertaken by Golder Associates Africa (Pty) Ltd (GAA) and which was submitted to the DMR recently.. Ivanplats has submitted a Water Use Licence Application (WULA) to the Department of Water and Sanitation (DWS) relating to their BSS operations, and is still to submit the IWULA for the entire Platreef Project to the DWS. The date for submission of the Platreef Project is dependent on the granting of the BSS WULA and will be confirmed with the DMR at a later stage.

5.2 Item 3(d)(ii): Description of the Activities to be undertaken

5.2.1 Mining Process

The Project will utilise the sublevel blast hole stoping method, whereby the ore zones are divided into individual stopes/areas. Access drifts are driven through the ore zone at the top and bottom of each stope. At the bottom of the stope, a number of drawpoints are developed to extract the ore. The ore is drilled and blasted from the access drifts and the ore is removed from the stope using a diesel-powered Load-Haul-Dump (LHD) and dumped in an orepass located nearby. From here the ore is loaded onto trucks and hauled to ore bins located near the production shaft.

Access from the production shaft to the ore zones will be provided by the development of main access levels at depths of 750 m, 850 m, 950 m and 1 000 m below surface. Stope access will be provided by ramps and additional mining sublevels located near the individual ore zones. The ore will be fed from the ore bins to a crusher who will be located below the 1 000 m level. The crusher will discharge the ore into a fine ore bin. The ore will then be fed onto a conveyor system which will be located on the 1 000 m level that will be transferring it to a skip loading station at the production shafts.

Primary access to the underground mine is planned to be via a 7.25 m wide and 975 m deep bulk sample and ventilation shaft (i.e. Shaft No. 1). Ivanplats has already commenced with the sinking of Shaft No. 1. There will also be a second shaft (i.e. Shaft No. 2) which will serve as a production and service shaft and will be 10 m wide and 1100 m deep. The headgear for Shaft No.2 will be approximately 96 m high whilst the headgear for Shaft No. 1 is approximately 45 m high. The inclusion of Shaft No. 2 and height of the associated headgear is one of the key amendments addressed as part of this EIA Addendum Report.

There will also be three ventilation (vent) shafts; vent raises 1 and 2 will be 6 m wide and 975 m deep, whilst, vent shaft 3 is 6 m wide and 750 m deep. The positions of these vent raises have changed during the detailed design phase, this re-positioning has also been addressed herein.

Once the mining of each stope is completed, Ivanplats are proposing to backfill these stopes with a combination of cemented rock fill and paste fill. It should be noted that this activity of backfilling was not comprehensively addressed as part of the previous EIA process undertaken in 2013. This EIA Addendum Report also does not deal with the proposed

backfilling activity as it triggers the requirement for a new WML, hence a new EIA process will need to be conducted. This will be applied for by Ivanplats at a later stage.

5.2.2 Ore Processing

As part of the Project, a concentrator plant will be developed at three separate production phases of 4 Million tonnes per annum (Mtpa), 8 Mtpa and 12 Mtpa during the Life of Mine (LoM). The concentrator plant will consist of three stages of crushing, ball milling and classification; these activities are discussed further below.

5.2.2.1 Run of Mine Storage and Reclamation

Run of Mine (ROM) is crushed underground to a top size of 150 mm. The pre-production ROM material is conveyed to the 500 000 tonne (t) ROM stockpile. Once the production plant is operational, the material will be reclaimed by means of a Front End Loader (FEL) into the 70 t ROM silo feed bin. ROM material is fed onto a 250 mm vibrating grizzly via vibrating feeders. Grizzly oversize is fed to a jaw crusher for RoM top size control. The combined grizzly undersize and jaw crusher product is conveyed to the 6000 t ROM silo. During normal production the material from the mine will be conveyed directly into the 70 t reclaim bin and be fed to the ROM silo via the vibrating grizzly and jaw crusher circuit.

The ROM silo is equipped with apron feeders for extraction onto the crushing circuit feed conveyor. Tramp metal is removed prior to crushing by means of a tramp metal magnet situated at the conveyor head end.

Ore is proposed to be stored in two separate stockpiles, namely Low-Grade and High-Grade. The Low-Grade ore stockpiles will have a total volume of 5 154 000 tonnes while the High- Grade stockpile will have a total volume of 1 415 000 tonnes. The height of these stockpiles is approximately 25 m.

5.2.2.2 Crushing and Screening

The material from the ROM silo is conveyed to the 125 t primary crusher feed bin from where it is extracted by means of a vibrating feeder and fed to a cone crusher for primary crushing. The crusher circuit consists of one primary cone crusher (open circuit), one secondary cone crusher (closed circuit) with a set of double deck vibrating screens, and two tertiary cone crushers (closed circuit) with a set of vibrating screens.

The primary and secondary crusher product is collected in two 110 t coarse ore screening feed bins, from where it is extracted and fed to two double deck vibrating coarse ore screens. The top decks of the coarse ore screens have apertures of 38 mm, and the oversized material from the top decks are transferred to the 125 t secondary crusher feed bin.

The secondary crusher product is transferred back to the coarse ore screening section. The bottom decks of the coarse ore screens have 12 mm apertures. The oversized material from the bottom decks, together with the oversized material from the fine ore screens, are transferred to two 45 t tertiary crusher feed bins. The tertiary crusher product is transferred to the fine ore screening section for final classification. The tertiary crusher product is collected in two 45 t fines screening feed bins, from where it is fed to two single deck vibrating screens (10 mm apertures). The oversized material from the fine ore screens is recycled back to the tertiary crusher feed bins, together with the 12 mm deck oversize from the coarse ore screening section. The tertiary screening product is conveyed to the mill feed silos.

5.2.2.3 Milling

A mill feed silo is fed via conveyor with final crushed product. The silo is equipped with three belt feeders which draw material from the silo onto the mill feed conveyor. The primary mill is an Effective Grinding Length (EGL) ball mill. The mill is operated in open circuit and grinds to a product size of 500 µm. The mill discharges directly to the secondary mill sump. The secondary mill is operated in closed circuit with a multi-cyclone nest; the circuit is designed for a re-circulating load of 250 % and produces 75 µm from the new feed size of 500 µm. Water is added to the mill discharge sump to give a cyclone slurry feed density of approximately 51 %. The overflow from the cyclones is at a density of 30 % approximately and then gravitates directly to the flotation circuit conditioning tank.

The media used for the mill will be high chrome steel. Steel balls are added to the mill using a dedicated ball kibble, magnet and hoist arrangement. This will be a semi-automated operation and steel will be added as required. Spillage from the milling circuit will report to the mill discharge sump.

5.3 Mine Ancillary Infrastructure

The Project requires support facilities and infrastructure to operate. The major infrastructure requirements are discussed in the sections below and depicted in Plan 3.

5.3.1 Water Management

Ivanplats is a member of the Joint Water Forum (JWF); which forms part of Olifants River Water Resource Development Project (ORWRDP), and the Pruissen Water Forum. Participants in the water scheme are required to indicate their water requirements from the scheme, for the total water requirements to be calculated relative to the capacity of the scheme. These requirements are translated into a non-binding Memorandum of Agreement and then a binding Off-take Agreement. The Project has indicated that their water requirement is approximately 16.2 Ml/d.

Water treatment requirements for the Project consist of the following:

- Mine Dirty Water Treatment Plant – treatment of mine water for re-use;
- Raw Water Treatment Plant – treatment of process water from Return Water Dams to augment internal recycled process water;
- Potable Water Treatment Plants – treatment of raw water from Flag Boshielo Dam for potable use at the mine;
- Process Water Filtration Plant – to augment internal recycled process water; and
- Sewage Treatment Plant – treatment of sewage generated on the mine, the plant is currently being designed to have a capacity to treat waste generated by 3000 people at a rate of approximately 150-200 litres per day.

These water treatment activities have been previously assessed. There have however been several amendments to the water storage and management structures as described below.

5.3.1.1 Raw Water Dam

There are two (2) proposed raw water dams as part of the Project. The dam sizes will each have a capacity of 49 000 m^3. The dam will be of earthworks construction assuming 50% cut and 50% fill. The incoming stream shall be deemed non-hazardous raw water as it will be drawn from the Flag Boshielo Dam, and a single 2 mm thick High Density Polyethylene (HDPE) liner will be provided to prevent seepage losses. Raw water tanks will also be provided closer to the plant infrastructure; this water will supplement the water required for the processing activities.

5.3.1.2 Attenuation Ponds

There are two attenuation ponds proposed to collect and store surface water runoff. Pond 1 will have a capacity of 125 000 m^3 and Pond 2, a capacity of 150 000 m^3. These attenuation ponds are located along the eastern boundary of the Project infrastructure area. To cater for the 1:50 year flood event, a new stormwater drain has been proposed to discharge the excess water directly into the Mogalakwena River. The drain will be lined with concrete and will be 17.5 m wide. A maintenance road has also been proposed along the entire length of the drain, which is approximately 8 km. The proposed maintenance road will be 6 m in width with a 1.5 m and 1 m shoulder on either side. Alongside this proposed maintenance road, Ivanplats are also proposing a water supply pipeline with a servitude of 2.5 m. The proposed pipeline would serve to transport water abstracted from the Mogalakwena River to the mine. These structures would be fenced off to ensure the safety of the surrounding communities.

5.3.1.3 Contaminated Water Dams

There are several dams proposed around the mine infrastructure area to collect contaminated water for treatment and re-use. In particular, there will be:

- Mine Dirty Water Storage Dam – drains and stores water from both Shaft No. 1 and Shaft No. 2 areas;
- Mine Clear Water Storage Dam - storage of recycled mine water for re-use; and
- Process Water Dam storage of recycled process water.

It should be noted that fire water will be stored at separate dams/tanks located around the Project site. Below is a description of the key contaminated water dams.

5.3.1.3.1 Stormwater Pond

The stormwater pond serves to collect all dirty water from the mine, including process and mine water for re-use within the mine. The stormwater pond, with a capacity of 225 000 m^3 will have a HDPE liner. The stormwater pond will be located along the south-western corner of the Project site.

5.3.1.3.2 Leachate Pond

A leachate pond will be constructed to receive leachate emanating from the landfill, composting waste areas as well as water from the Material Recovery Facility (MRF) and tyre storage facility. The pond will have a composite liner system including a HDPE geo-membrane and compacted clay liner. The leachate pond has been designed to take a volume of approximately 2 300 m^3 water. The pond will be excavated to a depth of 3 m below ground level and side slopes will be 1:2.5.

The water management structures will be addressed in more detail in the Integrated Water and Waste Management Plan (IWWMP), currently being compiled by GAA.

5.3.2 Waste Management

All waste management facilities were approved, however the change in position of the waste management infrastructure is being addressed through a separate WML Variation Application undertaken by GAA and was submitted to the DMR separately. These waste management facilities will be located in a designated integrated waste management area, located along the southern boundary of the mine infrastructure layout. This area will be demarcated from the remaining plant area, with a concrete palisade fence and will be access controlled at all times. The following waste management facilities have been included within this infrastructure area:

- **General Landfill** - The overall size of the landfill will be 120 m by 170 m and will be split up into two cells. Construction rubble and other inert materials may be used as land fill cover material, which will be stored adjacent to the general landfill;

- **Composting Plant** - The composting facility size was determined based on total combined volume of 4 736 m³ per year for organic waste, sewage sludge, wood, garden waste, and wood and paper packaging. The composting facility will be a 150 mm thick reinforced concrete slab 120 m long and 30 m wide (3 600 m²). The concrete slab will be divided into 5 sections to accommodate different composting activities;
- **General Waste Storage Area -** The general waste storage facility will be 25 m long by 20 m wide. This area will involve the separation and storage of recyclables, composting and landfill disposal;
- **Hazardous Waste Storage Area –** The hazardous waste storage facility will be 20 m long by 15 m wide and will include the necessary containers and bunds. The facility will have a liner protected reinforced concrete slab and the facility will be covered entirely with a roof 3 m high;
- **Salvage Yard** - The salvage yard will be 100 m by 100 m (1 hectare) to contain 12 months of scrap metal storage; and
- **Tyre Storage Area** - Tyres and conveyor belts will be stored in a separate facility with the required stacking and spacing arrangements. This facility will be 136 m long by 72 m wide.

The above mentioned waste management facilities have been re-positioned as a result of the reduction of the mine infrastructure footprint. The amendment however is not significant due to the waste management facilities remaining within the designated waste management area. The change in positions is being addressed through a separate WML Variation Application undertaken by GAA and will be submitted to the DMR separately.

5.3.2.1 Waste Rock

In addition to the facilities mentioned above, waste rock that is mined from the underground workings will be stored on the Project site through a Waste Rock Berm and a Waste Rock Stockpile. Waste rock will be crushed using a mobile waste rock crusher; the crusher will be located within the Waste Rock Stockpile area. Once crushed, waste rock will be transport via truck to the designated waste rock berm or stockpiles.

The WRB will be constructed around the Project site and is intended as a safety boundary between the mine's activities and the community developments as well as to act as a noise and visual buffer to the surrounding communities[1]. The WRB will be developed and maintained to a height of 10 m. There will be approximately four (4) WRBs located along the boundary of the Project site.

[1] This was a recommendation in the approved EMPR for the Platreef Mine (2013)

The anticipated volumes of material to be stored at each are provided below:

- Berm 1 – 549 435 m^3
- Berm 2 – 310 289m^3
- Berm 3 – 302 219 m^3
- Berm 4 – 337 897m^3

The waste rock stockpile will have a volume of 5 000 000 m^3 at a height of approximately 25 m. For the purposes of this assessment, it has been assumed that the waste rock berms/stockpile will be permanent facilities, until such time that the proposed backfilling operations have been licenced. After which, Ivanplats can reclaim the waste rock material for mine backfilling.

With the recent amendments to the relevant waste management legal framework, the waste rock facilities for the Project are deemed to be legally authorised, Ivanplats should however ensure that the management measures prescribed in the approved EMP are adhered to with respect to these facilities.

5.3.2.2 Tailings Storage Facility

On 30 July 2015, the LEDET approved the establishment of a TSF on the RE of Farm Rietfontein 2 KS. Since the TSF site has already been approved as part of the authorisation received in July 2015, it has not been dealt with in this Addendum Report.

Ivanplats have however amended the route alignment of the TSF pipeline from the concentrator plant to the Rietfontein 2 KS TSF site. The reasoning for this re-alignment was to maintain a servitude that followed existing servitudes (i.e. Eskom Powerline and Turfspruit Road). The amended servitude will cover an area of approximately 22.06 ha.

5.3.3 Power Supply

Ivanplats have entered into an agreement with Eskom, whereby the parastatal will supply 70 MVA of power by expanding the national grid that would bring an additional high voltage line near the Project site. Further agreements with Eskom were made to provide a temporary supply of a 5 MVA overhead power lines to support the power requirements during any future construction activities for the Project. Associated with these power lines, a temporary substation (5 MVA) and a permanent substation (70 MVA) will be established. These facilities have been authorised through a separate EIA process undertaken by Eskom.

The distribution power line leading from the temporary substation will have a capacity of 33 kV; this however does not exceed the regulatory threshold to trigger a listed activity in terms of Listing Notice 1 (EIA Regulations, 2014). For the LoM, it is proposed that there will be three 11 kV distribution powerlines.

In addition, a diesel generator set with a capacity of 15 MVA and generation capacity of less than 10 MW will be established on the Project site for emergency power. An above-ground storage tank will be provided for the storage of diesel adjacent to the diesel generator set and will have a capacity of 60 m^3.

Ivanplats is also currently investigating the potential of renewable energy (i.e. solar photovoltaic (PV)) to reduce the reliance on the national grid. Ivanplats are investigating options for siting, capacity and design of such a facility. This development may trigger a separate EIA process.

5.3.4 Road Infrastructure

The Project site is accessed from the N11, a double-lane tarred national highway. The N11 runs directly through the Turfspruit and Macalacaskop farms. A Traffic Impact Assessment (TIA) undertaken by Aurecon South Africa (Pty) Ltd recommended the following road upgrade of the N11 for improved mobility:

- N11 northern approach to have one through lane, 60m left turning lane and 60m right turning lane; and
- N11 southern approach to have one through lane, a slip lane and a 60m right turning lane.

The upgrade of the N11 has been approved by the South African National Roads Agency Limited (SANRAL) as such the upgrade will commence in the second quarter of 2016.

Within the Project site, there will be several mine (20.53 ha) and service roads (1.82 ha). These roads serve to allow for mine vehicles to gain access to each designated area and are not designed for hauling, except for the haul roads between the designated waste rock stockpiles.

5.3.5 Additional Support Infrastructure

Additional mine support infrastructures that have been specified as part of the DFS include:

- Above-ground storage tanks for the storage of fuels (2 x 60 m^3, 4 x 82 m^3 and 2 x 20 m^3). The combined storage of fuels will therefore be 488 m^3;
- General mine offices, change houses, stores and workshops which will be limited to a height of 12 m;
- Gate house, there will be one gate house at the main mine entrance. There will be one emergency exit gate located at the northern boundary, this gate will be closed permanently; and
- Engagement centre and clinic will be the point of first contact for visitors and new employees. The centre will have the following facilities: induction facilities, medical examination centre, training office, Human Resources office, medical and fire rescue centre, parking area as well as Bus and Taxi drop-off area.

5.3.6 Project Schedule

The construction of Shaft No. 1 commenced in 2014 and is currently still being developed. The construction of Shaft No. 2 (i.e. production shaft) is now scheduled to commence on 01 January 2017. Construction of Shaft No. 2 will take approximately two years to complete and to intersect the reef. Phase 1 of the Project is expected to have a LoM of 30 years.

5.3.7 Project Activities

Table 5-2 provides a summary of the list of amended activities associated with the Project phases (i.e. construction, operation and decommissioning) that will be further assessed in this EIA Addendum Report.

Table 5-2: List of Project Activities

Activity No.	Activity:
Construction Phase	
1	Mine Development: Headgear, Sinking Shafts and Vent Raises
2	Linear Infrastructure: Access/ haul roads, stormwater drain, TSF pipeline
3	Distribution powerlines and substations (< 33 kV)
4	Generation of power using diesel generators (<10 MW)
Operational Phase	
5	Crushing: Waste Rock Crusher/Mine Crushers
6	Hauling: Internal mine roads, haul roads and access roads
7	Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore
8	Mining Processes: Production Shafts and Vent Raises
9	Generation of power using diesel generators (<10 MW)
10	Water management infrastructure
Decommissioning phase	
11	Demolition & removal of all infrastructure
12	Rehabilitation and sealing shafts

6 Item 3(e): Policy and Legislative Context

This section aims to provide a description of the policy and legislative context within which the Project is being proposed. This section has been divided into national, provincial, local by-laws; and standards and guidelines.

Table 6-1: National Legislation

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
The Constitution of the Republic of South Africa, 1996 Under Section 24 of the Constitution of the Republic of South Africa, 1996 (the Constitution) it is clearly stated that: *Everyone has the right to (a) an environment that is not harmful to their health or well-being; and* *(b) to have the environment protected, for the benefit of present and future generations, through* *reasonable legislative and other measures that -* *(i) Prevent pollution and ecological degradation;* *(ii) Promote conservation; and* *(iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*	An EIA process has been previously undertaken in 2013 for the Project to determine the impacts associated with the Project. As part of the EIA process, mitigation measures and monitoring plans were recommended to ensure that any potential impacts can be managed to acceptable levels to support the rights as enshrined in the Constitution. This amendment application process serves to ensure that any further potential impacts associated with the proposed project amendments are also addressed and managed to acceptable levels.	The Project does currently hold an approved Mining Right and EA obtained in 2014 as well as a WML, approved in 2015. As such, Ivanplats have undertaken the necessary processes to identify, manage and address all potential impacts associated with the Project. In terms of every subsequent, amendment to the Project, Ivanplats have undertaken to ensure that the same due process is undertaken for the amended activities, to manage and address the associated potential impacts. As such, a Regulation 31 Application in terms of the EIA Regulations, 2014 and a Section 102 Application in terms of the MPRDA will be submitted to the DMR for consideration. This report also serves to provide an indication of the additional potential impacts and to mitigate these potential impacts to an acceptable level.
National Environmental Management Act, 1998 (Act No 107 of 1998) and EIA Regulations (December 2014) The Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA), as amended was set in place in accordance with Section 24 of the Constitution. Certain environmental principles under NEMA have to be adhered to, to inform decision making for issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that: *The potential impact on the environment and socio-economic conditions of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.* The EIA Regulation, 2014 was published under GN R 982 on 4 December 2014 (EIA Regulations) and came into operation on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R 983 (Listing Notice No. 1), GN 984 (Listing Notice No. 2) and GN R 985 (Listing Notice No. 3) in terms of Sections 24(2) and 24D of the NEMA, as amended. The EIA Regulations have been made applicable to prospecting and mining activities.	The EIA process previously undertaken in 2013 for the Platreef Project was undertaken in accordance with the principles of Section 2 of NEMA as well as with the EIA Regulations, 2010, promulgated in terms of NEMA. An environmental authorisation was granted to Ivanplats in terms of the EIA Regulations, 2010. As part of this authorisation, several listed activities of the Listing Notices of 2010 were approved. It should be noted that for this amendment application, all activities listed in Table 5-1 have been approved in terms of the EIA Regulations, 2010 or do not trigger the relevant thresholds in the EIA Regulations, 2014. Thus, an amendment application in accordance with the EIA Regulations, 2014 (Regulation 31) for these amended activities has been submitted to the DMR who is the Competent Authority to fulfil all necessary processes in terms of the NEMA.	The Project does currently hold an approved Mining Right and EA, dated 2014. Ivanplats have undertaken the necessary processes to identify, manage and address all potential impacts associated with the Project. In terms of every subsequent, amendment to the Project, Ivanplats have undertaken to ensure that the same due process is undertaken for the amended activities, to manage and address the associated potential impacts. The approved Environmental Management Programme Report (EMP) is guiding the current construction phase of the Platreef Project. Furthermore, through this Amendment Process, the EMP will be updated with further mitigation, management and monitoring actions to ensure compliance with the various pieces of environmental legislation that feed into the principles of the NEMA.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) On 29 November 2013, the list of waste management activities published under GN R718 of 3 July 2009 (GN R718) was repealed and replaced with a new list of waste management activities under GN R921 of 29 November 2013. Included in the new list are activities listed under Category A, B and C. These activities include inter alia the following: Category A describes waste management activities requiring a Basic Assessment process to be carried out in accordance with the EIA Regulations supporting an application for a waste management licence; Category B describes waste management activities requiring an Environmental Impact Assessment process to be conducted in accordance with the EIA Regulations supporting a waste management licence application; and Category C describes waste management activities that do not require a WML but these activities will have to comply with the prescribed requirements and standards as prescribed by the Minister, which includes the Norms and Standards for Storage of Waste, 2013. These activities include the storage of general waste at a facility with a capacity to store in excess of 100 m^3 and storage of hazardous waste in excess of 80 m^3. The Waste Classification and Management Regulations published under GN R 634 of November 2013 require that all wastes be classified according to SANS10234 and managed according to its classification. The National Norms and Standards for the Assessment of Waste for Landfill Disposal were published under GN R635 on 23 August 2013 and prescribe the requirements for the assessment of waste prior to disposal to landfill in terms of Regulation 8(1)(a) of the Waste Classification and Management Regulations. The National Norms and Standards for the Disposal of Waste to Landfill were published under GN R 636 of 23 August 2013 and determine the requirements for the disposal of waste to landfill as contemplated in Regulation 8(1)(b) and (c) of the Waste Classification and Management Regulations. The Regulations Regarding the Planning and Management of Residue Stockpiles and Residue Deposits from a Prospecting, Mining, Exploration or Production Operation were published in GNR 632 on 24 July 2015 under section 69(1)(i) of the NEM:WA. The purpose of the Regulations is to regulate the planning and management of residue stockpiles and residue deposits from prospecting, mining, exploration or production operations.	A WML has been granted for the Platreef Project in 2015, in terms of GNR 718, 2009 for a number of listed activities under Category A and Category B. Thus a full EIA process was undertaken to assess all listed waste management activities. There are transitional provisions provided for projects which have been approved in terms of legislation or regulations that have been appealed. However, the Project will eventually be required to comply with the regulations, particularly those relating to the National Norms and Standards for the storage of waste and the assessment and disposal of waste to landfill and the Waste Classification and Management Regulations.	The Project does currently hold an approved WML, dated 2015. As such, Ivanplats have undertaken the necessary processes to identify, manage and address all potential impacts associated with the waste management activities of the Project. The approved EMP is guiding the current construction phase of the Platreef Project. Linked to the amendment application process is a separate process referred as a WML variation application, in which minor amendments to the approved WML are requested. In particular, the positions of the waste management facilities have changed to a limited extent. Ivanplats are also currently undertaking a Waste Classification process to assist with the management of any potential contaminants of all waste materials and stockpiles.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Mineral and Petroleum Resource Development Act. 2002 (Act No. 28 of 2002) The MPRDA sets out the requirements relating to the development of the nation's mineral and petroleum resources. It also aims to ensure the promotion of economic and social development through exploration and mining related activities. The MPRDA requires that mining companies assess the socio-economic impacts of their activities from start to closure and beyond. Companies must develop and implement a comprehensive Social and Labour Plan (SLP) to promote socio-economic development in their host communities and to prevent or lessen negative social impacts.	A Mining Right (MR) was granted in 2014 by the DMR. All supporting documentation was also approved, including the EMP, associated Mine Works Programme (MWP) and SLP.	In terms of this amendment application process, a Section 102 Application in terms of the MPRDA will be submitted to the DMR to address the changes to the approved mine layout plan. These amendments will also be addressed through an addendum to the EIA/EMP Report.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) The prevailing legislation in the Republic of South Africa with regards to the Air Quality field is the National Environment Management: Air Quality Act (Act No. 39 of 2004) (NEM: AQA). According to the Act, the DEA, the provincial environmental departments and local authorities (district and local municipalities) are separately and jointly responsible for the implementation and enforcement of various aspects of NEM: AQA. A fundamental aspect of the new approach to the air quality regulation, as reflected in the NEM: AQA is the establishment of National Ambient Air Quality Standards (NAAQS). These standards provide the goals for air quality management plans and also provide the benchmark by which the effectiveness of these management plans is measured. The NEM: AQA provides for the identification of priority pollutants and the setting of ambient standards with respect to these pollutants.	To comply with the NEM:AQA, an Air Quality Impact Assessment (AQIA) was undertaken as part of the previous EIA process. The purpose of the AQIA was to determine the baseline atmospheric conditions and compare these against the NAAQS. This report was reviewed and accepted as part of the environmental authorisation received.	As part of the amendment application process, an addendum AQIA has been compiled to determine the potential impacts of the Project amendments against on baseline conditions. The required measures to ensure compliance with the NEM:AQA and NAAQs are included in the approved EMP as well this EIA/EMP Addendum Report. Ivanplats are undertaking continuous monitoring to determine the Project's emissions compared to the NAAQS and hence confirming the adequacy of the mitigation and management measures undertaken.
National Dust Control Regulation. 2013 The Minister of Water and Environmental Affairs, released on the 01 November 2013 the National Dust Control Regulation, in terms of Section 53, read with Section 32 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004). In the published National Dust Control Regulations, terms like target, action and alert thresholds were omitted. Another notable observation was the reduction of the permissible frequency of exceedance from three to two incidences within a year. The standard actually adopted a more stringent approach than previously, and would require dedicated mitigation plans now that it is in force.	To comply with the NEM:AQA, an Air Quality Impact Assessment (AQIA) was undertaken as part of the previous EIA process. The purpose of the AQIA was to determine the baseline atmospheric conditions and compare these against the NAAQS. This report was reviewed and accepted as part of the environmental authorisation received.	As part of the amendment application process, an addendum AQIA has been compiled to determine the potential impacts of the Project amendments against on baseline conditions. The required measures to ensure compliance with the NEM:AQA and NAAQs are included in the approved EMP as well this EIA/EMP Addendum Report. Ivanplats are undertaking continuous monitoring to determine the Project's emissions compared to the NAAQS and dust control regulations and hence confirming the adequacy of the mitigation and management measures undertaken.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
National Noise Control Regulations, R.154 of 1992 (the Noise Regulations) promulgated in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) The National Noise-Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) (NCRs) form part of the Environmental Conservation Act and these Regulations apply to external noise. The NCRs differentiates between Disturbing Noise levels (which is objective and scientifically measurable which are generally compared to existing ambient noise level) and Noise Nuisance (which is a subjective measure and is defined as noise that "*disturbs or impairs or may disturb or impair the convenience or peace of any person*"). Local Authorities use Controlled Areas to identify areas with high noise levels. Restrictions have been set out for development that occurs in these Controlled Areas. These regulations make provision for guidelines pertaining to noise control and measurements. The regulations make reference to the use of the South African National Standards 10103:2008 (SANS) guidelines for the Measurement and Rating of Environmental Noise with Respect to Land Use, Health, and Annoyance and to Speech Communication. As such, a Noise Impact Assessment in accordance with the NCRs must be undertaken for submission to determine the potential disturbing and nuisance noise levels associated with a particular development.	A Noise Impact Assessment was undertaken as part of the previous EIA process. The purpose of the assessment was to determine the baseline noise levels and compare these against the SANS guidelines. This report was reviewed and accepted as part of the environmental authorisation received.	As part of the amendment application process, an addendum Noise Impact Assessment has been compiled to determine the potential impacts of the Project amendments and to predict the noise impacts on the identified noise sensitive receptors by use of noise dispersion modelling. The required measures to ensure compliance with the SANS guideline and Noise Control Regulations are included in the approved EMP as well this EIA/EMP Addendum Report. Ivanplats are undertaking continuous monitoring to determine the Project's noise emissions, particularly from blasting activities.
The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is the overarching legislation that protects and regulates the management of heritage resources in South Africa. The Act requires that Heritage Resources Agency's in this case the South African Heritage Resources Agency (SAHRA) and Limpopo Provincial Heritage Resources Authority (LIHRA), be notified as early as possible of any developments that may exceed certain minimum thresholds. This act is enforced through the National Heritage Regulations GN R 548 (2000).	A Heritage Impact Assessment (HIA) was undertaken as part of the previous EIA process. The purpose of the assessment was to determine the sensitivity of the mine area in relating to resources of archaeological or heritage value. This report was reviewed and accepted as part of the environmental authorisation received, however an approval was also granted by SAHRA.	As part of the amendment application process, an addendum HIA has been compiled to determine the potential impacts of the Project amendments against the sensitive heritage features identified. Furthermore, a survey of new structures (particularly linear infrastructure) resulted in the identification of additional heritage resources. The required measures to ensure compliance with the NHRA is included in the approved EMP as well this EIA/EMP Addendum Report. Furthermore, a Conservation Management Plan (CMP) has been compiled for the Project. This report will be submitted to the SAHRA for review and approval.
GN R 527 (MPRDA Regulations), 2004 Regulation 527 (R527) specifies that the EMP must include environmental objectives and specific goals for mine closure. The applicant for a mining right must make prescribed financial provision for the rehabilitation or management of negative environmental impacts, which must be reviewed annually. R527 provides specific principles for mine closure including safety and health, residual and latent environmental impacts etc.	A Closure Cost Assessment and Rehabilitation Plan were submitted with the Mining Right Application to the DMR and thus approved as part of the previous EIA process.	The Closure Cost Assessment and Rehabilitation Plan have been amended to incorporate the Project amendments and will be re-submitted to the DMR for approval. Ivanplats will thereafter be required to review and update this on an annual basis.

Table 6-2: Provincial Legislation

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Limpopo Environmental Management Act, (Act No. 7 of 2003) The Limpopo Environmental Management Act, (Act 7 of 2003) (LEMA), is aimed at managing and protecting the environment in the Limpopo Province as well as securing ecologically sustainable development and responsible use of natural resources in the Province.	An EA was granted in terms of the EIA Regulations, 2010. During the EIA process an extensive baseline investigation was undertaken to determine the site sensitivities and regulatory thresholds and requirements for all environmental aspects. As such the LEMA would have been an instrument in determining those requirements and thresholds.	This EIA/EMP Addendum Report has been based on the same baseline investigation, and thus complies with the provisions set out in this Act.
Limpopo Heritage Regulations GN R 103 The Limpopo Heritage Authority has been established and is responsible for the management of heritage resources in the Province.	A HIA was undertaken as part of the previous EIA process. The purpose of the assessment was to determine the sensitivity of the mine area in relating to resources of archaeological or heritage value. This report was reviewed and accepted as part of the environmental authorisation received, however an approval was also granted by SAHRA.	As part of the amendment application process, an addendum HIA has been compiled to determine the potential impacts of the Project amendments against the sensitive heritage features identified. Furthermore, a survey of new structures (particularly linear infrastructure) resulted in the identification of additional heritage resources. The required measures to ensure compliance with the NHRA is included in the approved EMP as well this EIA/EMP Addendum Report. Furthermore, a Conservation Management Plan (CMP) has been compiled for the Project. This report will be submitted to the Limpopo Heritage Authority as a stakeholder on the Project.

Table 6-3: Local By-Laws

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Waste (July 2004) Chapter 2 of the by-laws attend to a Local Waste Plan. The objectives of the local waste plan, as set out in the by-laws, include: *a) establishing a means of ensuring that waste is collected, re-used, recycled or disposed of without causing harm to human health or damage to the environment and, in particular, without:-* *(i) risk to water, air, soil, plants or animals;* *(ii) causing nuisance through noise or odours; or* *(iii) adversely affecting rural or urban areas or areas of special interest;* *c) encouraging the minimisation or reduction of waste;* Sections 22 of the Waste by-law outline the laws governing the storage, collection, transportation and disposal of Special Industrial, Hazardous or Health Care Risk Waste.	As part of the approved Waste Management Plan compiled during the previous EIA process for the Project in 2013, these local requirements were taken into consideration. Furthermore, during project commencement, Ivanplats are required to consult with the local authorities in terms of specific requirements and capacity.	The Waste Management By-Laws applicable to Ivanplats are currently being complied with on the Project site and will continue to be observed during the construction of Shaft 2.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Water and Sanitation (2005) Chapter 2 of the Water and Sanitation by-law outlines the laws governing the application for water services. The main requirement is that no one shall gain access to water services from the water supply system, sewage disposal system or through any other sanitation services unless they have applied for such services to the authorised agent.	Ivanplats is a member of the Joint Water Forum (JWF); which forms part of Olifants River Water Resource Development Project (ORWRDP), and the Pruissen Water Forum. Participants in the water scheme are required to indicate their water requirements from the scheme, for the total water requirements to be calculated relative to the capacity of the scheme. These requirements are translated into a non-binding Memorandum of Agreement and then a binding Off-take Agreement. Ivanplats is committed to working with the JWF to develop the ORWRDP as the primary source of bulk water to the service the needs of the Project.	Water supply services from the local municipality will not be required however, Ivanplats is continuing with negotiations for an off-take agreement from the ORWRDP.
Waterberg-Bojanala Priority Area in terms of GN R 495 on 15 June 2012 The Waterberg-Bojanala Priority Area comprises the Waterberg District in Limpopo Province and the Bojanala Platinum District in the North West. The overall aim of establishing the Waterberg-Bojanala Priority Area is to regulate and to ensure future sustainable development in the area and maintain the NAAQS. It became critical that a Priority Air Quality Management Plan for the area be developed. A Priority Air Quality Management Plan includes the establishment of emissions reduction strategies and intervention. The implication of this is that all current and future contributing sources in the area will be assessed to determine the emission reduction targets to be achieved over the following years.	To comply with the NEM:AQA, an AQIA was undertaken as part of the previous EIA process. The purpose of the AQIA was to determine the baseline atmospheric conditions and compare these against the NAAQS. This report was reviewed and accepted as part of the environmental authorisation received.	As part of the amendment application process, an addendum AQIA has been compiled to determine the potential impacts of the Project amendments against on baseline conditions. The required measures to ensure compliance with the NEM:AQA and NAAQs are included in the approved EMP as well this EIA/EMP Addendum Report. Ivanplats are undertaking continuous monitoring (PM_{10}) to determine the Project's emissions compared to the NAAQS and hence confirming the adequacy of the mitigation and management measures undertaken. This information will assist in identifying possible emission reduction strategies for the Platreef Project in the future.

Table 6-4: Standards and Guidelines

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
The South African National Standards SANS 10103:2008 "The measurement and rating of environmental noise with respect to annoyance and to speech communication" (SANS 10103:2008) Provides for noise thresholds/limits within urban and rural areas and for night and day time.	A Noise Impact Assessment was undertaken as part of the previous EIA process. The purpose of the assessment was to determine the baseline noise levels and compare these against the SANS guidelines. This report was reviewed and accepted as part of the environmental authorisation received.	As part of the amendment application process, an addendum Noise Impact Assessment has been compiled to determine the potential impacts of the Project amendments and to predict the noise impacts on the identified noise sensitive receptors by use of noise dispersion modelling. The required measures to ensure compliance with the SANS guideline and Noise Control Regulations are included in the approved EMP as well this EIA/EMP Addendum Report. Ivanplats are undertaking continuous monitoring to determine the Project's noise emissions, particularly from blasting activities.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
The South African National Standard for Ambient Air Quality – Limits for Common Pollutants 1929:2011 Provides for pollutant concentration thresholds/limits as guidance to protect overall human health. Pollutants include SO_2, O_3, NO_2, CO, to name a few.	To comply with the NEM:AQA, an Air Quality Impact Assessment (AQIA) was undertaken as part of the previous EIA process. The purpose of the AQIA was to determine the baseline atmospheric conditions and compare these against the NAAQS. This report was reviewed and accepted as part of the environmental authorisation received.	As part of the amendment application process, an addendum AQIA has been compiled to determine the potential impacts of the Project amendments against on baseline conditions. The required measures to ensure compliance with the NEM:AQA and NAAQs are included in the approved EMP as well this EIA/EMP Addendum Report. Ivanplats are undertaking continuous monitoring to determine the Project's emissions compared to the NAAQS and hence confirming the adequacy of the mitigation and management measures undertaken.
International Finance Corporation Performance Standard 3: Resource Efficiency and Pollution Prevention is applicable to the visual assessment. Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional and global levels. For the purposes of this Performance Standard, the term 'pollution' is used to refer to both hazardous and non-hazardous chemical pollutants in the solid, liquid, or gaseous phases, and includes other components such as pests, pathogens, thermal discharge to water, Greenhouse Gas (GHG) emissions, nuisance odours, noise, vibration, radiation, electromagnetic energy and the creation of potential visual impacts including light (IFC, 2012).	IFC Performance Standards were used as a guideline to assess the visual impacts associated with the Project. A Visual Impact Assessment (VIA) was undertaken as part of the previous EIA and hence approved.	For this Amendment Application Process, an addendum VIA was compiled to determine the potential impacts of the Project amendments (i.e. height of infrastructure) on the surrounding visual receptors. The EIA/EMP Addendum Report takes these guidelines into consideration to mitigate, as far as possible, all the negative visual impacts associated with the amended activities.

7 Item 3(f): Need and Desirability of the Proposed Activities

Ivanplats has commenced with the construction of certain Project infrastructure such as the mine boundary fence as well as the sinking of Shaft No. 1. Prior to the installation of the mine boundary fence and during site establishment, the planned mine infrastructure area, which covered an approximate 420 hectares (ha), was advanced on by surrounding communities. As a result of the communities moving closer, Ivanplats was required to revise the mine layout plan by amending the footprint and/or location of certain activities/infrastructure. The total area of the mine infrastructure area is now 345 ha, thus reducing the approved area by a total of 74 ha.

The communities proximity to the mine infrastructure area is illustrated in a comparative map that shows the approved boundary and the reduced boundary (please refer to Appendix B (Plan 4)). Below is a list of the communities surrounding the mine infrastructure area and their current position:

- Ga-Magongoa – lies directly adjacent to the eastern boundary of the mine infrastructure area (this community has not moved as it has always been in close proximity to the infrastructure area);
- Ga-Kgobudi – moved into the mine infrastructure area. The approved infrastructure boundary was bent in the north-west corner around the nearest property of this community which was 35 metres from the previous infrastructure boundary. With the proposed amendment, this community lies directly adjacent to the new boundary; and
- Ga-Kgobudi 2 (Mzombane) – moved closer similarly to Ga-Kgobudi on the western side of the approved infrastructure boundary. The nearest houses are 150 metres from the approved infrastructure boundary. With the proposed amendment, this community lies directly adjacent to the new boundary.

The need and desirability of this amendment relates primarily to accommodating the communities that have moved in closer to the mine's boundary and restructuring the mine's layout plan to optimise the proposed infrastructure footprint and manage the potential impacts to the surrounding communities. Further impact assessments have been conducted to ensure the negative social and environmental impacts associated with the amendment of the mine's footprint and project activities are minimised.

Further to this, Ivanplats is the holder of a Mining Right. EA and a WML, the amended and additional activities and their aerial extent, as listed in Table 5-1, all fall within the granted authorisations and do not trigger any further listed activities.

8 Item 3(g): Motivation for the Preferred Development Footprint within the Approved Site including a Full Description of the Process followed to reach the Proposed Development Footprint within the Approved Site

8.1 Item 3(g)(i): Details of the Development Footprint Alternatives considered

A project alternative is defined as a possible course of action, in place of another, that would meet the same purpose and need (DEAT, 2004).

In an EIA process, project alternatives serve to determine the most effective way of meeting the objectives of that project. This is generally done through either enhancing the benefits of an activity and/or mitigating the negative impacts and risks of an activity.

According to the Department of Environmental Affairs (DEA) Criteria for Determining Alternatives in EIA Guideline (2004), there are various types or categories of alternatives, including:

- Location alternative – alternative project sites in the same geographic area;
- Process/design alternative – alternative process/design/equipment;
- Activity alternative – consideration of different means to achieve the same project objective;
- Routing alternative – consideration of different routes for linear infrastructure;
- Site layout alternative – consideration of the different options to place project infrastructure;
- No-go alternative – the proposed project/activity does not proceed, implying that the current situation or status quo remains.

8.1.1 Location Alternative

It is recognised that in some cases, an alternative location or site cannot be considered due to the nature of the project. Since mining and extraction can only occur at the location of an ore body, it is not feasible to consider alternative locations. In the case of this Project, the proposed amendment falls within the approved mining right area and involves a reduction in the footprint of the mine infrastructure area only. The overall feasibility of the Project, particularly the location of the mine has been proved through the Pre-Feasibility Study (PFS) concluded in 2013. Furthermore, Ivanplats has commenced with the construction of the mine and sinking of Shaft No. 1.

No alternative locations have been identified or assessed in this EIA Addendum Report as it would not meet the overall objective of the Project, which is ultimately to allow Ivanplats to mine the Platinum resource located below the current mine location.

8.1.2 Design Alternative

As part of the proposed amendments, Ivanplats considered the following options for the proposed stormwater management infrastructure to release stormwater from the Project site in a responsible manner should the 1:50 year flood occur. The following options were considered:

- Channel stormwater through an open V drain; or
- Pipe the stormwater through an underground pipeline.

Ivanplats undertook the necessary investigations to determine the advantages and disadvantages associated with releasing stormwater from the mine infrastructure area and at which point this stormwater could be released. It was determined, that from a safety perspective to the surrounding communities, it is best to release the water further downstream from the mine infrastructure area so as not to cause any safety risks within the communities or damages to property in the event of a flood.

Ivanplats considered both, the development of an open V drain or an underground pipeline, both of which would be approximately 8 km in length to allow for the release of the stormwater into a tributary of the Mogalakwena River.

In terms of the design it was determined, that the underground pipeline option would result in rapid water flow downstream, which could result in erosion of the stream banks and other resultant negative impacts on water quality and quantity as well as aquatic habitat. However, from a safety perspective to the surrounding communities, this option of a pipeline would not result in significant safety risks. The underground pipeline is however associated with a much higher capital cost than an open drain and would also result in higher maintenance costs.

The open V drain, designed with a width of 17.5 m will be lined with concrete. This design allows for the reduced flow of water downstream reducing the impacts to the downstream water quality. It is Ivanplats intention to mitigate any safety risks associated with the open V drain by erecting a fence along the entire length of the drain. There will however be designated safe crossing paths to allow for community mobility. The cost associated with developing the drain is significantly lower than that of the pipeline, including the required maintenance costs.

8.1.3 Activity Alternative

As part of the amendment process, there are no alternative activities that have been identified, as the activities associated with the Project have already been approved. This EIA Addendum Report serves primarily to address the reduced mine infrastructure footprint and the re-positioning of infrastructure within this area. The key activities associated with the Project remain as they were approved in 2014 and 2015.

8.1.4 Routing Alternative

In terms of routing alternatives, Ivanplats has reconsidered the routing of a section of the TSF pipeline leading from the concentrator plant to the TSF site, located at the RE of Farm Rietfontein 2 KS. The approved route for the pipeline traverses through an existing servitude for a powerline. This route option is not ideal as it also traverses several farm properties which pose a challenge to maintenance and control of unplanned incidents (i.e. burst pipeline) that may occur.

A new route has been proposed, parallel to the Turfspruit road, before it heads north towards Rietfontein. This reduces the potential impacts to farm land, but does however increase the length of the pipeline.

8.1.5 Site Layout Alternative

As part of the amendment process, the site layout for the mine infrastructure area had been revised to accommodate for the reduced footprint area. In particular, structures within the mine infrastructure area were re-positioned to optimise the space available (now 345 ha). This reduction of the footprint and re-positioning of infrastructure was necessary to control the potential impacts and risks associated with the communities' proximity to the mine.

In particular, the following key amendments were identified and are also assessed further to determine the potential impacts and risks to the surrounding communities:

- Shafts – 2 production shafts and 3 vent raises (re-positioning of vent raises);
- Crushing and stockpiling – amendments to the volume and footprints of the stockpiles and the separation of high grade and low grade ore into individual stockpiles; and
- Repositioning of water management structures including the stormwater dam and attenuation dams to control the flow of stormwater on site as the stormwater run-off could significantly impact the receiving environment and communities downstream.

8.1.6 No-Go Alternative

This alternative defines the situation which would result should the Project amendments not proceed.

The "no-go" alternative assumes that the Project amendments is not implemented and therefore the mine infrastructure footprint remains as is, however Ivanplats would have no control of the land due to the growth of the surrounding communities. The no go alternative would mean that the Project amendments would not go ahead and as a result any potential impacts associated with the proposed amendment would not occur. However, there are several impacts associated with not proceeding with the amendments, these include:

- Safety risks associated with inappropriate stormwater management structures;
- The Project would not be able to proceed with optimising the available space and such may result in in mine process inefficiencies due to space constraints; and

- The operational and maintenance difficulties that may be experienced as a result of routing the TSF across existing servitudes and current farm lands.

The potential impacts associated with the no-go alternative will be inherently assessed as part of this EIA Addendum Report by identifying and assessing the potential impacts associated with the Project amendments.

8.2 Item 3(g)(ii): Details of the Public Participation Process followed

A Public Participation Process (PPP) was initiated, which is central to the investigation of environmental and social impacts, as it is important that stakeholders who are affected by the Project are given an opportunity to identify concerns and to ensure that local knowledge, needs and values are understood and taken into consideration as part of the impact assessment process. The public participation process for the Project will follow the steps provided below.

8.2.1 Identification and Verification of Stakeholders

Stakeholders from the existing Project database were used and their contact details verified. Stakeholders included:

- Directly affected and surrounding landowners;
- National, Provincial and Local Government;
- Ward councillors;
- Local villages;
- Traditional authorities;
- Agricultural entities;
- Local businesses; and
- Non-governmental organisations.

The existing Project database will be verified and updated throughout the amendment process to ensure accuracy of stakeholder information.

8.2.2 Announcement of Amendment Application

The legislative requirements indicate that specific materials be developed and distributed as part of the PPP. Considering good practice also the following methods have been implemented for PP material to inform stakeholders about the Project (see Table 8-2 for further details).

- **Project announcement letter:** A letter was sent in English, Tsonga and Sepedi that contained information about the Project, applicable legislation, competent authorities and details of the appointed independent Environmental Assessment Practitioner

(EAP). This letter also announced the availability of the EIA Addendum Report and provided information about the Public Meeting.

- **Background Information Document (BID) with Comment and Registration Form:** included the location and a project description, locality map, legislative processes and requirements being followed, specialist studies to be conducted, list of competent authorities and the consultation / registration process with contact details of the Stakeholder Engagement Office. A Registration and Comment Sheet was also provided for stakeholders to use for formal registration as I&APs or to submit comments. The BID was available in English, Sepedi and Tsonga.
- **Newspaper Advertisements:** an English newspaper advert was placed in the Bosvelder, Limpopo Mirror and Seipone. The advert included a brief project description, applicable legislation, competent authorities and details of the appointed EAP. EAP and information about the 17 April 2016 Public Meetings. An additional advert announcing the Public Meetings scheduled for 17 April 2016 was placed in the Seipone Newspaper and Bosveld Review.
- **Site Notices:** English, Sepedi and Tsonga site notices were put up at various places around the Project site. These site notices contained a brief project description, information about the required legislation, competent authorities and, details of the EAP and information about the 17 April 2016 Public Meetings.

The information documentation detailed above was distributed to identified stakeholders by means of email, fax or post, or by hand where required.

8.2.3 Availability of the EIA Addendum Report

The Addendum report was scheduled to be made available at public libraries (Mogalakwena Public Library and Mahwelereng Public Library) for the full 30-day (29 March – 28 April 2016) public comment period, but due to strike action at these libraries, the report could only be made available at the libraries from 12 – 28 April 2016.

Alternative measures were taken in an effort to provide access to the reports for the full 30 days. These included having the report available at the Ivanplats mine site security gate, at the Ivanplats Stakeholder Engagement Department (SED), at the various stakeholder meetings undertaken and additional copies were placed at the Tribal Authorities of Tshamahansi and Moshate during the comment period of 30 days. Moreover, the report was made available at the Ivanplats CRA Mobile Office which made its rounds at the various sites between 09:00 and 15:00 daily. The sites included Moshate, Masehlaneng, Madiba, Mokaba, Magongoa, Masodi, Sekgoboko, Kgobudi, Maroteng, Malepetleke, Macheke, Masenya, Machikiri, Sekgakgapeng, Mabusela, Polar Park, Hlongoane, Kgobudi 2 (Mzombane), Kgosana and Baloyi. The report was also available on the Digby Wells website (www.digbywells.com) and CDs were available at the various stakeholder meetings and on request.

8.2.4 Project Consultation

Consultation with I&APs will be conducted during the availability of the EIA Addendum Report, which will be made available for a public comment period of 30 days. A variety of stakeholder meetings were undertaken which included traditional authorities, key stakeholders, communities and the general public. Comments received from I&APs are included in the Comment and Response Report (CRR) (see Appendix C6). It is noted that video footage of the various stakeholder meetings were also taken and can be made available.

In preparation of the various meetings scheduled, key stakeholders were reminded of the meetings by means of telephonic consultation. It is also noted that representatives from key competent and commenting authorities, municipalities and NGOs were formally invited by means of invitation letters sent via email (See Appendix C5). Comments raised by stakeholders are captured in the CRR and responded to by the relevant specialists and project team.

Provided below is a summary of the individual stakeholder meetings that were scheduled during the 30-day public comment period and information materials utilised during these meetings.

8.2.4.1 Traditional Authorities: Moshate Focus Group

This meeting was scheduled at the Moshate Village on Tuesday, 12 April 2016 from 09:00 – 11:00, but did not take place. Kgosi Kekana of the Mokopane Traditional Council communicated to Ivanplats that he was not going to partake in the Amendment Application process, and as a result, no meeting was undertaken. It was also noted that there are some concerns from the Traditional Council about the construction of the N11 intersection currently underway.

8.2.4.2 Traditional Authorities: Tshamahansi Focus Group

This meeting was scheduled at the Tshamahansi Village on Tuesday, 12 April 2016 from 13:00 – 15:00 and was completed without any disruptions or issues. The PowerPoint was presented in Tsonga and the meeting facilitated in Tsonga to allow for broad participation and local understanding of the project.

8.2.4.3 Key Stakeholder Meeting

This meeting was scheduled at the Oasis Lodge in Mokopane on Wednesday, 13 April 2016 from 09:00 – 11:00 and was completed, but it is noted that the meeting endured various disruptions from a few key stakeholders. Key comments from the attendees are provided below:

- Ivanplats should not have presented at the meeting, but rather Digby Wells;
- Legacy issues residing with Ivanplats needs to be resolved; and

- The Magongoa Public Meeting scheduled for the afternoon of 13 April 2016 will be disrupted.

It was intended to conduct the meeting in English only, since key stakeholders from various sectors of society were invited to attend, but in an effort to reinforce participation a combination of English and Sepedi was used. The following organs of state attended the meeting:

- Department of Water and Sanitation;
- Department of Agriculture, Forestry and Fisheries;
- Limpopo Department of Economic Development, Environment and Tourism; and
- Mogalakwena Local Municipality.

8.2.4.4 Magongoa Public Meeting

This meeting was scheduled at the Moshate Village on 13 April 2016 from 13:00 – 18:00 and did not commence due to the attendees from the Key Stakeholder Meeting following through on their threats that the public meeting would be disrupted. The disruptions were however supported by various other members of the community.

The interruption took place in the form of key stakeholders taking charge of the microphones and not allowing any representative from the project team to address the community. The meeting was thereafter called to a close after agreement was reached that the meeting should not continue.

8.2.4.5 Tshamahansi Public Meeting

This meeting was scheduled at the Tshamahansi Village on Wednesday, 13 April 2016 from 13:00 – 18:00 and did not take place as the Tshamahansi Traditional Council requested that they be given time to provide feedback to the Chief of Tshamahansi. They did however agree to hold the meeting in Tshamahansi Village on Sunday, 17 April 2016.

8.2.4.6 Kgobudi Public Meeting

This meeting was scheduled at the Lekwa Sports Ground on Sunday, 17 April 2016 from 09:00 – 11:00 and was intended for the following communities to attend: Mzombane, Sekgoboko and Kgobudi. An independent facilitator proficient in Sepedi was present at this meeting. This meeting did not proceed.

It is noted that community members were not allowed by the disrupters to freely sign attendance registers or take up their seats in the marquee prior to commencement of the public meeting. The meeting was further disrupted by a few individuals who started packing up the chairs put out for the attendees to sit on.

8.2.4.7 Masodi Public Meeting

This meeting was scheduled at the Masodi High Sports Ground on Sunday, 17 April 2016 09:00 – 11:00 and was intended for the following communities: Masehlaneng, Moshate, Maroteng and Masodi. The meeting did not continue since the following individuals disrupted the meeting by taking control of the microphone and addressing the community members present.

Some of the attendees were prohibited to sign the attendance registers. The meeting was cancelled as a result of the same individuals who started packing up the chairs intended for the community members to sit on. The independent Sepedi-speaking facilitator engaged the main disrupters after the meeting in an effort to resolve matters.

8.2.4.8 Tshamahansi Public Meeting

This meeting was scheduled at the Tshamahansi Village on Sunday, 17 April 2016 from 09:00 – 11:00 and was successfully undertaken. An independent facilitator proficient in Tsonga was present at this meeting. The presentation and facilitation took place in Tsonga. The following was noted during the public meeting:

- Training: communities queried how they go about receiving their certificates for the training completed through Ivanplats;
- Blasting: happening at night and it does disturb the communities;
- Noise: concerns raised about noise levels at night which causes a disturbance;
- Waste Management: how will waste be managed and disposed of; and
- Heritage: why the heritage artefacts are going to Wits University – is should rather go to the Mokopane Museum.

8.2.4.9 Ivanplats Employee Consultation

Employees from Ivanplats were also informed about the proposed amendments, since majority are employed from surrounding communities. This was done by means a PowerPoint presentation given at the company's recurring "Toolbox Talk" sessions as follows:

- Thursday, 14 April 2016: meeting was held at the Ivanplats Mine Offices based in Mokopane; and
- Friday, 15 April 2016: meeting was held at the Ivanplats Mine Site.

In Table 8-, photos of the various stakeholder meetings held, or prepared for and not undertaken as a result of the disruptions, are provided.

Table 8-1: Meetings Planned

Stakeholder Meeting	Photo
Tshamahansi Traditional Authorities Focus Group *Tuesday, 12 April 2016 from 13:00 – 15:00*	
Key Stakeholder Meeting *Wednesday, 13 April 2016 from 09:00 – 11:00*	
Kgobudi Public Meeting *Sunday, 17 April 2016 from 09:00 – 11:00*	

Stakeholder Meeting	Photo
Masodi Public Meeting *Sunday, 17 April 2016 from 09:00 – 11:00*	
Tshamahansi Public Meeting *Sunday, 17 April 2016 from 09:00 – 11:00*	

8.2.4.10 Information Media

In an effort to provide stakeholders with ease of access to information, which is understandable and available in their language of choice, the following information media were made available at the various stakeholder meetings as indicated below.

- **PowerPoint:** the PowerPoint presentation provided an overview of key components of the EIA Addendum Report and was available in English, Sepedi and Tsonga.
- **Posters:** as indicated in the photos above, posters were put up at the various meetings for stakeholders to peruse. These were laminated, A1 full colour posters providing a summary of the PowerPoint presentation. The posters were available in English, Sepedi and Tsonga.

- **Pamphlets:** these handouts were duplicates of the poster set put up at the various stakeholder meetings and available in A4, full colour prints in English (1150 copies), Sepedi (350 copies) and Tsonga (250 copies).
- **Additional media:** at the stakeholder meetings CDs containing the full EIA Addendum Report, printed copies of the EIA Addendum Report, registration and comment forms and the Ivanplats Social and Labour Plan (SLP) booklets were also available to stakeholders.

8.2.5 Public Participation Activities

Public Participation activities for the Amendment Application Process are summarised below together with the relevant reference for proof.

Table 8-2: Public Participation Activities

Activity	Details	Reference in Report
Identification of stakeholders	An existing stakeholder database was verified to reflect various sectors of society, including directly affected and adjacent landowners, in and around the study area. The database was updated throughout the amendment process.	**Appendix C1** Stakeholder Database
Distribution of announcement letter and Background Information Document (BID)	A BID, announcement letter with a Registration and Comment Form was emailed, posted and faxed to stakeholders on 04 March 2016.	**Appendix C2** Announcement Materials
Placing of newspaper advertisement	An advert was placed in the Bosveld Review – English (11 March 2016), Capricorn Voice – English (9 March 2016) and Seipone – Tsonga and Sepedi (16 March 2016) for Public Meetings scheduled on 13 April 2016. An additional advert was placed in the Seipone – Tsonga and Sepedi (13 April 2016) and Bosveld Review – English (8 April 2016) for Public Meetings scheduled on 17 April 2016.	**Appendix C3** Proof of Advertisement
Putting up of site notices	English, Sepedi and Tsonga site notices were placed at the Project site, local libraries, municipal offices and visible public venues on 08 March 2016. A site notice placement report and map has also been compiled.	**Appendix C4** Proof of Site Notices

Activity	Details	Reference in Report
Announcement letter of Addendum report	Announcement of availability of the Addendum report was done by means of the project notification letter emailed and posted to stakeholders on 04 March 2016. SMS notification was also sent to stakeholders providing details of the Public Meetings and availability of the report. Additional SMS notification was also sent to stakeholders on 31 March 2016 providing details of Public Meetings on 17 April 2016. Copies of the EIA Addendum Report was made available at the following places: ▪ Mogalakwena Public Library; ▪ Mahwelereng Public Library; ▪ Ivanplats CRA Mobile Unit; ▪ Ivanplats Mine security gate; and ▪ Moshate and Tshamahansi Tribal Authorities. The EIA Addendum report was also made available on the Digby Wells www.digbywells.com (under Public Documents) for 30 day comment period and at all the Public Meetings for perusal. *(Comment period for the Addendum report was between 29 March and 28 April 2016)*	**Appendix C2** Announcement Materials
Stakeholder meetings	The following stakeholder meetings were scheduled: ▪ Moshate Tribal Authority Focus Group Meeting on 12 April 2016; ▪ Tshamahansi Tribal Authority Focus Group Meeting on 12 April 2016; ▪ Key Stakeholder Meeting on 13 April 2016; ▪ Public meetings on 13 April 2016 at Magongoa and Tshamahansi respectively; and ▪ Public Meetings on 17 April 2016 at Kgobudi, Masodi and Tshamahansi respectively.	**Appendix C5** Invitation to Authorities
Obtained comments from stakeholders	Comments, issues of concern and suggestions received from stakeholders will be captured in the CRR.	**Appendix C6** Comment and Response Report

8.3 Item 3(g)(iv): The Environmental Attributes associated with the Development Footprint Alternatives

8.3.1 Baseline Environment

A detailed assessment of the baseline environment was provided in the previous specialist studies conducted for the Platreef Project in 2013. Therefore, this EIA Addendum Report, provides a synopsis of the baseline environment and has been updated, where relevant. Please refer to the Specialist Addendum Reports in Appendix D to J for a detailed baseline assessment.

8.3.1.1 Climate

The predominant wind direction is from northeast, with the secondary contributions from the east northeast and east respectively. Contributions from the northeast and southeast quadrant are dominant. Calm conditions (wind speeds < 0.5 m/s) occurred for 4.2 % of the time. Wind speed capable of causing erosion occurred 14.4% of the time. The latter is equivalent to 51 days of high wind speed capable of causing erosion in a year. This is twice the scenario observed in some areas.

As shown in Figure 8-1, for the period 2009-2012, the total monthly rainfall from January to December is presented. The annual total and average of 1021 mm and 719 mm are reported respectively, for the study area.

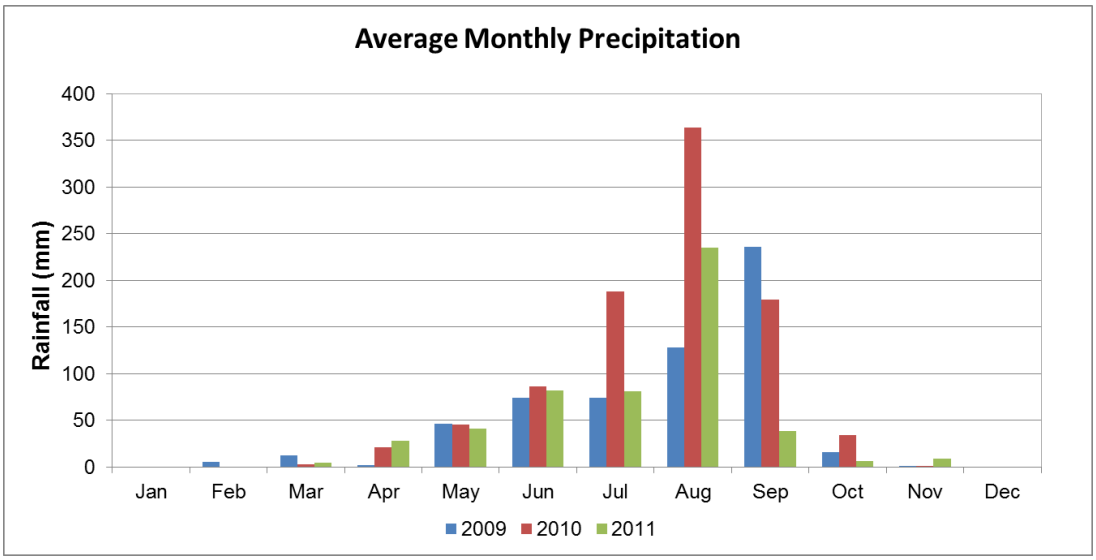


Figure 8-1: Average Monthly Precipitation

Please refer to Appendix E for the Air Quality Addendum Report for further detail.

8.3.1.2 Geology

The study area (the mining right area) is located on the Northern Limb of the Bushveld Igneous Complex (BIC). The BIC intrudes the Transvaal Supergroup, forming a massive igneous province up to 7 km in thickness, extending over 60 000 km². The BIC is the world's largest layered intrusion and the world's largest source of platinum (Cawthorn, 1999). The BIC is divided into four exposed sections, known as the Eastern, Western, Northern, and Southern Limbs. A fifth section, the Bethal Limb, is located under younger sedimentary cover and does not crop out.

Typically the BIC consists of a mafic–ultramafic layered suite, a granite suite, and a package of predominantly felsic volcanic rocks. Emplacement of the complex appears to have been rapid, with both intrusive and extrusive rocks dated to about 2 057 Ma (Harmer, 2000 cited in Kinnaird et al., 2005).

8.3.1.3 Topography and Visual Aspects

The study area falls within the Limpopo River Catchment Area with the perennial Mogalakwena River flowing along the western boundary. Floodplains occur along the Mogalakwena River on the south-western boundary of the study area with several non-perennial streams flowing in a westerly direction through the study area. The study area is situated within the Mogalakwena River valley. Mountainous areas run to the east and west of the study area, while the Project site itself. The study area is relatively flat except for the mountainous area in the north-eastern corner and several isolated ridges. The land within the study area is mainly used for agricultural activities and livestock.

The topographical model indicates that the elevation of the study area increases from 1 028 metres above mean sea level (mamsl.) in the Mogalakwena River floodplain in the south-western corner to 1 747 mamsl. on the ridges in the north-eastern corner of the study area.

The majority of the study area has gentle slopes of less than 2.8°.Slopes of between 2.9° and 8.5° occur near the base of the ridges in the north-east of the study area. Moderate slopes of between 8.6° and 16.6° occur at the foot of the ridges. The steepest slopes occur on the ridges and range between 16.7° and 56.6°.

The slope aspect / direction of the study area is generally in a westerly and south-westerly direction towards the Mogalakwena River. Slopes of various other directions occur in isolated areas along the river valleys and on the ridges.

The visibility of the Project refers to the viewshed area. The Project has a high visibility as it is visible from a large area (practical viewshed of approximately 321.92 km²) with numerous visual receptors. The relatively flat topography of the study area provides minimal screening; however the mountainous areas to the east and west of the study area will provide screening of the Project to those areas beyond the Mogalakwena river valley.

The Topography and Visual Addendum Report is attached as Appendix D.

8.3.1.4 Soils, Land-Use and Land Capability

Existing land type data was used to obtain generalised soil information and terrain types for the study area. Land type data exists in the form of published 1:250 000 maps. These maps indicate delineated areas of similar terrain types, pedosystems (uniform terrain and soil pattern) and climate (Land Type Survey Staff, 1989).

The study area is undulating and is located within the dominant Ae, Ah and Ib land types of the 2328 Pietersburg and 2428 Nylstroom land type maps (Land Type Survey Staff, 1989). These land types indicate that the underlying geology consist mainly of hornfels, shale, quartzite, conglomerate, granite and biotite granite. The Ae land type covers most of the southern part of the Project site while land types Ah and Ib cover the northern part of the Project site.

The Ae land type is flat with slopes of 1 – 5 % while the Ah and Ib land types are undulating containing slopes of 5 – 10 % and 10 – 100 % respectively. The Ib land type is easily recognised as rocky outcrops within the study area.

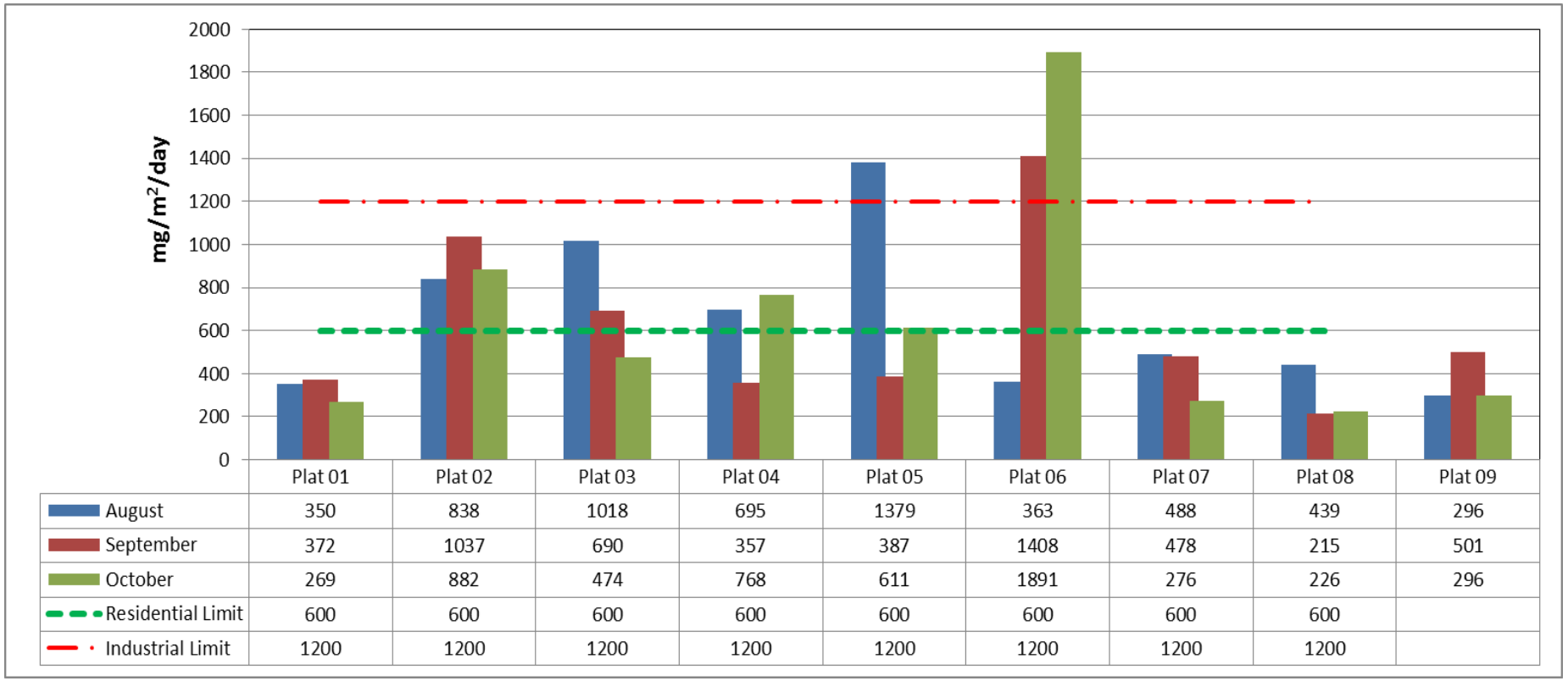
Land capability is determined by a combination of soil, terrain and climatic features. Land capability is defined by the most intensive long term sustainable use of land under rain-fed conditions. The site is dominated by the Ae land type indicating that arable agriculture is potentially possible but used presently for sustainable agriculture, specifically mixed arable and grazing (cattle) but dominated by grazing.

8.3.1.5 Air Quality

The Air Quality Addendum report is attached in Appendix E. The model predications have shown that there are instances were dust deposition rate, daily PM_{10} and $PM_{2.5}$, and hourly NO_2 and SO_2 values exceeded recommended standards. It is worth mentioning that these exceedances are not confined to the study area, rather, surrounding environments are affected.

Dust fall rates were measured (using ASTM D1739:1970 or equivalent) in the vicinity of the study area. Dust deposition rates from the monitoring network confirm that some sites are in violation of the National Environmental Management Air Quality Act; National Dust Control Regulations, 2013 (NEMAQA-NDCR) (GN R827 of 1 November 2013). Sites Plat 02 (Aug, Sep and Oct 2015) and Plat 03 (Sep and Oct 2015) were in exceedance of the residential limit (600 mg/m^2/day). At site Plat 06, the non-residential limit of 1200 mg/m^2/day was exceeded in Sep and Oct respectively (Figure 8-2). The recommended standards specified in NEMAQA-NDCR, 2013 stipulated two exceedances within a year, and it must not be sequential months.

The PM_{10} data analysed indicated that the daily concentrations are generally below the current standard of 75 µg/m^3 for greater part of the year, with two exceedances only. These exceedances occurred in February and December of 2015 (Figure 8-3).



	Plat 01	Plat 02	Plat 03	Plat 04	Plat 05	Plat 06	Plat 07	Plat 08	Plat 09
August	350	838	1018	695	1379	363	488	439	296
September	372	1037	690	357	387	1408	478	215	501
October	269	882	474	768	611	1891	276	226	296
Residential Limit	600	600	600	600	600	600	600	600	
Industrial Limit	1200	1200	1200	1200	1200	1200	1200	1200	

Figure 8-2: Average Monthly Dust Deposition Rates

Source: GAA, 2016

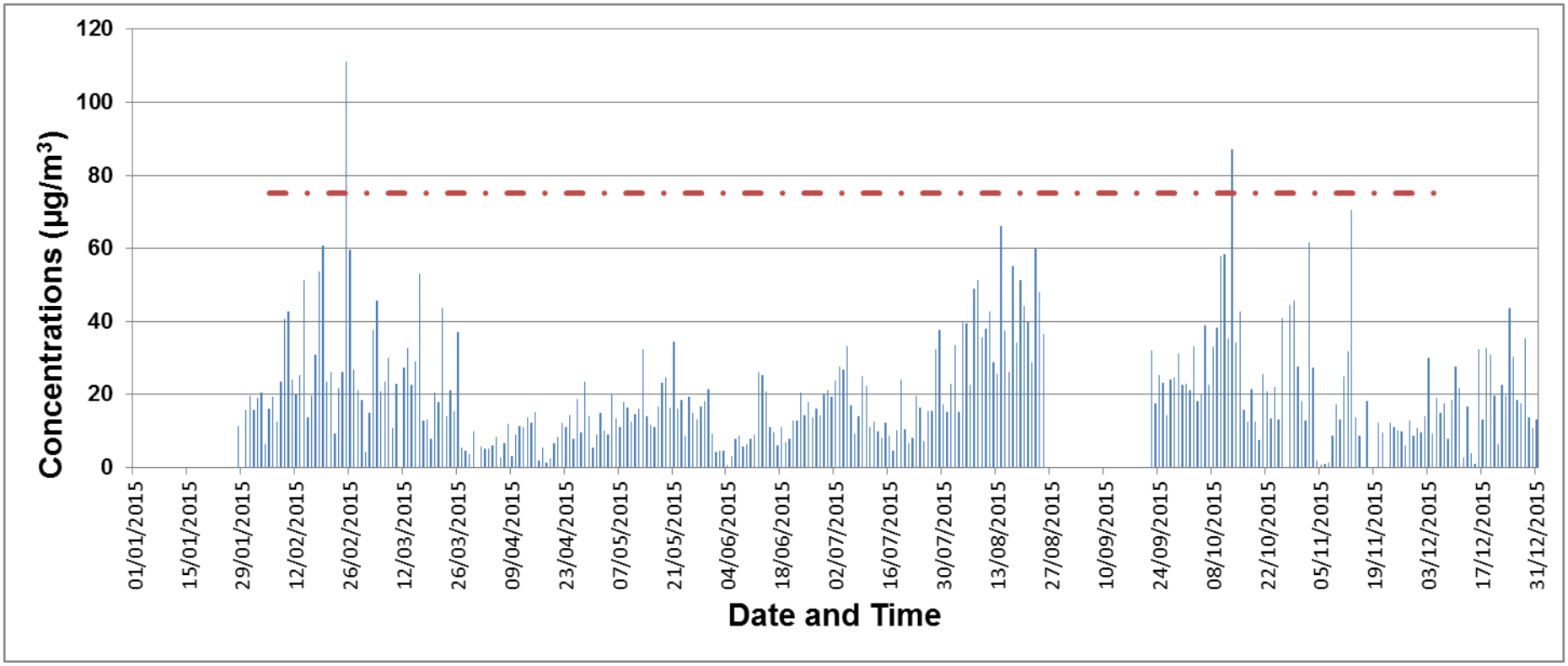


Figure 8-3: Average Monthly PM_{10} Concentrations

Source: GAA, 2016

8.3.1.6 Social

A detailed Social Impact Assessment (SIA) report was compiled in 2013. This socio-economic baseline provides a brief summary of the SIA providing an overview of the relevant socio-economic indicators of the study area.

The majority of the study area is owned by the Government of the Republic of South Africa, but is identified as indigenous/traditional land. This means that the Traditional Authority (TA) has jurisdiction over the land and holds the land in trust for its people. Individuals residing in households located on this land are therefore not title deed holders or owners of their plots of land but have been given Permission To Occupy (PTO) by either the headman or the chief.

An informal settlement located on land between Masodi and Tshamahansi referred to as Ga-Kgobudi 2 (Mzombane) moved closer to the the southern boundary of the approved mine infrastructure area. The south-western section of the mining right area overlaps with Mawhereleng (formalised township), which is a peri-urban area. Property and land ownership within this area is dictated under private tenure. Land uses within the site-specific area include residential, agricultural and grazing uses, while land that coincides with the Project footprint is mostly used for agricultural and grazing, purposes.

Population density indicates the potential pressure that human occupation might exert on natural resources and municipal service delivery. Therefore, it is expected, and evident from the growth of the communities into the infrastructure area, that the population density throughout the site-specific study area will exceed the municipal average, seeing as this area includes several townships, informal settlements and low-cost housing areas (these areas are usually associated with a relatively high population density) (MLM, 2012).

Age and gender are important socio-economic indicators of the labour-sending capacity of an area. Females slightly outnumber males in Limpopo, Mogalakwena LM and the site-specific area (StatsSA, 2013). The age distribution in the study areas under consideration, reveal that the majority of the population within these areas fall within the 15 – 64 year age bracket. This is indicative of a large potential work force (StatsSA, 2013). In 2011 the dominant spoken languages within Limpopo, Waterberg, Mogalakwena and the site-specific study area were Sepedi followed by Xitsonga. A person's primary home language is also indicative of their ethnic grouping, which means that the dominant ethnic groups within the study areas are the Pedi and Tsonga.

Level of education attained is used as an indicator of human capital and is measured by the level of formal education among the adult population. The level of formal education is relatively similar in each of the respective study areas, with the population with no schooling being relatively high in each area. Only a small proportion of the adult population within each area have completed Grade 12 (14-21%). The largest proportion of the population in each study area is engaged in elementary occupations, followed by those who are engaged in the craft related trades, and shop and market sales workers. These occupation types are usually

associated with a relatively basic skill set, which is indicative of a lack of formal education or limited employment opportunities, or a combination thereof within the respective study areas.

The mining sector contributed just more than R 87 billion (7.1 % of GDP) to the national economy in 2004 (Urban-Econ, 2006). The mining sector is similarly an important contributor to the provincial, district and municipal economy, making up 57.5 % of the provincial GDP in 2010 (Waterberg, 2010; Waterberg District Municipality (DM), 2012).

8.3.1.7 Heritage

The area of Platreef Mine has a time depth that spans from the Early Stone Age (ESA) through to the historical period. Evidence for the Stone Age is represented by archaeological sites, such as the Cave of Hearths in the Makapans Valley (part of the Fossil Sites of South Africa World Heritage Site (WHS), approximately 20 km east of the Project site. In addition to this, several stone tool accumulations have been recorded through previous studies completed in the region, commonly found within water courses and pans. These accumulations have primarily been ascribed to the Middle (MSA) and Late Stone Age (LSA) outside of any discernible context.

The Stone Age in southern Africa is followed by the Farming Community Period (also known as the Iron Age). Occupation of the area under consideration by Bantu-speaking farming communities spans from the Early (EFC) through to the Late Farming Community (LFC) Period. Previous studies in the area indicate that several sites associated with the LFC period have been identified and recorded, comprising of isolated ceramic scatters and sites comprising of several components and varying levels of complexity. The ceramics provide evidence of Farming Community settlement from at least the 17th century CE continuing to the 19th century CE. The combination of the various ceramic facies and types of stonewalled sites provide evidence of long-term occupation by Kekana as well as other groups.

Within this region of South Africa, there is sufficient evidence to indicate the continuity from the LFC into the historic period, and that this division is largely artificial. The first recorded contact between Europeans and the Kekana occurred in 1837 with the arrival of the Voortrekkers at Louis Trichardt. Through time, the Voortrekkers settled throughout the region establishing Pietpotgietersrus (today renamed Mokopane after Kekana chief Mugombane) in the 1850s. The settlement of the Voortrekkers here increased tensions with the local Kekana inhabitants. These tensions culminated in the infamous 1854 siege of Mugombane at Makapansgat (part of the Fossil Sites of South Africa WHS). Subsequent to this event, the Zuid-Afrikaansche Republiek (ZAR) demarcated the three dominant chiefdoms, namely the Valtyn, Mapela and Bakenberg polities within the area under consideration through the establishment of a 17 km long, 5 km boundary within which these constructed polities were confined.

A pre-disturbance survey of the proposed TSF pipeline re-routing and storm water drain routing option was undertaken. The results of the pre-disturbance survey are presented in Table 8-3 below and Appendix B (Plan 5). A Heritage Addendum Report has been compiled and attached as Appendix F.

Table 8-3: Heritage Resources Identified during the Pre-Disturbance Survey

IVA3396/2428BB/BGG-001 – Burial ground

Cultural Significance: Very High	**Co-ordinates**	
	-24.09377	28.97022

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA. BGG-001 can be described as a burial ground containing three graves located approximately 5 m from the proposed TSF pipeline re-routing. (See Figure 8-4 below). The burial ground is unfenced and unkempt, and located in a maize field. The tombstones were made from granite, and the middle tombstone had fallen over. Two of the graves could be dated (2003 and 2005).

BGG-001 has been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken (Ref: 48_01).



Figure 8-4: Burial Ground at BGG-001

IVA3396/2428BB/BGG-002 – Grave

Cultural Significance: Very High	Co-ordinates	
	-24.09331	28.97014

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA. BGG-002 can be described as a single grave located approximately 41 m from the proposed TSF pipeline re-routing (See Figure 8-5). The grave is located below a large Marula tree and unfenced. The headstone is a large lower grinding stone with a metal grave marker. No features to date the graves were noted.

This grave has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 8-5: Grave at BGG-002

IVA3396/2428BB/BGG-003 – Grave

Cultural Significance: Very High	Co-ordinates	
	-24.09678	28.98378

The site constitutes a potential burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-003 can be described as a potential grave located within the proposed TSF pipeline re-routing. BGG-003 was recorded due to the presence of a small metal cup at the base of a tree stump (See Figure 8-6). It is customary to leave cups or bottles at graves as gifts for the deceased. No features to date the graves were noted.

This grave has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 8-6: Potential Grave at BGG-003

IVA3396/2428BB/BGG-004 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.09760	28.99092

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-004 can be described as a burial ground containing two graves located approximately 5 m from the proposed TSF pipeline re-routing. (See Figure 8-7 below). The burial ground is unfenced and unkempt, and located in a maize field. The tombstones were made from granite and date to 1939 and 1941.

This burial ground has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 8-7: Burial Ground at BGG-004

IVA3396/2428BB/St-005 – Farming Community

Cultural Significance: Negligible	Co-ordinates	
	-24.09401	28.97037

The site constitutes surface scatters of material culture associated with the farming community period. Archaeological sites are generally protected under section 35 of the NHRA.

St-005 can be described as surface accumaltions of LFC ceramic sherds and a broken lower grinding stone located within the proposed TSF pipeline re-routing (See Figure 8-8). The pottery pieces were not diagnostic, but had indications of decorations i.e. straight lines and comb-stamped lines. The artefacts were not found *in-situ* due to agricultural activites, however there is a high possibility of additional heritage resources located sub-surface.

This site has been sufficiently recorded and is **not considered further** in this assessment.



Figure 8-8: Surface occurrence of Farming Community Artefacts at St-005

IVA3396/2428BB/BGG-006 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.10229	28.94401

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-006 can be described as a burial ground containing approximately 40 graves located approximately 129 m from the proposed storm water drain route (See Figure 8-9). The burial ground is fenced and marginally kempt. Several of the graves had granite tombstones, while other graves were simple stone circles. There were no features to date the stone graves.

BGG-006 has been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken (Ref: 52_01).



Figure 8-9: Burial Ground identified at BGG-006

IVA3396/2428BB/BGG-007 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.11078	28.93334

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-007 can be described as a burial ground containing at least 15 graves located approximately 100 m from the proposed storm water drain route (See Figure 8-10). The burial ground is fenced and marginally kempt. One of the burials had a granite tombstone, while the remaining burials were simple stone circles. There were no features to date the stone graves.

BGG-007 has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 8-10: Burial Ground identified at BGG-007

8.3.1.8 Noise

The initial baseline noise monitoring was undertaken in 2011. The data is deemed to be relevant for this amendment process as the land use type and main sound producing activities in the study area have not changed.

The results from the noise meter recordings for all the sampled points as well as the rating limits according to the SANS 10103:2008 guidelines are presented in Table 8-4. The locations of the monitoring points can be viewed in Appendix B (Plan 6).

The Noise Addendum Report is attached in Appendix H.

Table 8-4: Results of baseline noise measurements

Sample ID	SANS rating limit			Measurement details		
	Type of district	Period	Acceptable rating level dBA	$L_{Areq,T}$ dBA	Maximum/Minimum dBA	Date
Plat 1	Suburban	Daytime	50	48	75 / 36	07/11/2011
		Night time	40	44	65 / 41	07/11/2011
Plat 2	Suburban	Daytime	50	47	75 / 33	08/11/2011
		Night time	40	43	66 / 27	08/11/2011
Plat 3	Suburban	Daytime	50	46	73 / 32	09/11/2011
		Night time	40	45	64 / 36	09/11/2011
Plat 4	Suburban	Daytime	50	51	79 / 33	10/11/2011
		Night time	40	52	70 / 30	10/11/2011
Plat 5	Suburban	Daytime	50	47	71 / 37	11/11/2011
		Night time	40	45	68 / 33	11/11/2011
Plat 6	Suburban	Daytime	50	28	80 / 20	22/08/2013
		Night time	40	27	65 / 20	22/08/2013
	Indicates $L_{Aeq,T}$ levels above either the daytime rating limit or the night time rating limit					

8.3.1.8.1 Plat 1

The measurement was taken in the Masodi community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

8.3.1.8.2 Plat 2

The measurement was taken in the Ga-Madiba community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

8.3.1.8.3 Plat 3

The measurement was taken in the Ga-Kgobudi community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

8.3.1.8.4 Plat 4

The measurement was taken in the Ga-Magongoa community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured above the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts. Ambient day time noise levels are characterised by the intermittent noise from the livestock (roosters crowing) at this location.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

8.3.1.8.5 Plat 5

The measurement was taken in the Boloi community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

8.3.1.8.6 Plat 6

The measurement was taken in the Molekana community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured below the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts.

8.3.1.9 Description of Specific Environmental Features and Infrastructure on the Site

No noteworthy environmental features are located within the amended mine infrastructure area. This area was categorised as being of moderate to low ecological sensitivity. Please refer to the ecological sensitivity map attached as Appendix B (Plan 7).

The burial grounds and graves associated with the TSF pipeline and stormwater drain is however considered to be of high importance and will be included in the current grave relocation process, should the amendment be approved.

Since Ivanplats was granted the necessary licences, the sinking of Shaft No. 1 and the establishment of the following infrastructure has occurred:

- The mine's access road;
- A mine boundary fence; and
- Temporary facilities such as workshops and offices.

This amendment application process serves to provide an updated mine infrastructure layout, thus no further permanent infrastructure has been established on site.

8.3.2 Environmental and Current Land Use Map

Please refer to Appendix B (Plan 8) that indicates the environmental and social sensitivities including the current land use of the study area.

8.4 Item 3(g)(v): Impacts and Risks Identified including the Nature, Significance, Consequence, Extent, Duration and Probability

Potential impacts associated with the establishment, operation and decommissioning of the Platreef Project were identified and assessed in the EIA Report submitted in 2013. For the purpose of this amendment application, the aspects of the environment that may potentially be further impacted by this amendment were reassessed.

The methodology used to determine the significance, probability, and duration of the identified potential impacts is described in detail in Section 0. The methodology determines the environmental significance using the following equation:

Significance of environmental impact = Consequence X Probability

The results of the impacts determination for the various activities considered are set out below.

8.4.1 Potential Impacts on Air Quality

(Please refer to detailed report in Appendix E)

8.4.1.1 Construction Phase

As part of the Construction Phase, the following activities are identified that may impact on the air quality of the area i.e. increasing particulate matter concentration in the ambient atmosphere:

- Mine Development of Headgear, Sinking Shafts and Vent Raises;
- Access/ haul roads and storm water drains; and
- Generation of power using diesel generators (<10 MW).

Table 8-5: Impacts associated with the Development of Headgear, Sinking of Shaft and Vent Raise

Activity and Interaction (Development of Headgear, Sinking Shaft and Vent raise requires site clearing)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Dust generation from site clearing of infrastructure footprint, dust generation from sinking shaft due to blasting			
Prior to mitigation/ management			
Duration	Medium term (3)	Impact can be reversed with minimal management after construction ceases.	Negligible (negative) – 35
Extent	Limited (2)	Limited to the site and its immediate surroundings.	

Activity and Interaction (Development of Headgear, Sinking Shaft and Vent raise requires site clearing)			
Dimension	**Rating**	**Motivation**	**Significance**
Intensity x type of impact	Minor - negative (-2)	Minor. Very little change to the baseline.	
Probability	Likely (5)	It is likely that dust generation will occur during construction.	
Mitigation/ Management actions			
▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing or digging must occur; and ▪ Drop heights when loading and offloading material should be minimised.			
Post- mitigation			
Duration	Medium term (3)	Impact can be reversed with minimal management after construction ceases	Negligible (negative) – 21
Extent	Limited (2)	Will only occur within and immediately around the Project site.	
Intensity x type of impact	Minor - negative (-2)	Minor. Very little change to the baseline.	
Probability	Unlikely (3)	It is unlikely that dust emissions will have an effect on air quality	

Table 8-6: Impacts associated with the Construction of Access / Haul Roads and Stormwater Drains / Berms

Activity and Interaction (Access / haul roads and storm water drains/berms requires site clearing)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality			
Prior to mitigation/ management			
Duration	Medium term (2)	Dust will be generated for duration of the construction phase	Minor (negative) – 42
Extent	Local (3)	Airborne dust may extend across the development site area.	
Intensity x type of impact	Minor (-2)	Minor effect surrounding area is anticipated	
Probability	Almost certain (6)	There is a possibility that generated dust will impact ambient air quality.	
Mitigation/ Management actions			

Activity and Interaction (Access / haul roads and storm water drains/berms requires site clearing)			
Dimension	**Rating**	**Motivation**	**Significance**
▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging or scraping must occur; and ▪ The drop heights when loading onto trucks and at tipping points should be minimised.			
Post- mitigation			
Duration	Short term (2)	Dust generation will occur for the duration of this phase.	Negligible (negative) – 12
Extent	Very Limited (1)	After mitigation measures are implemented, It is expected that dust impacts will be limited to isolated parts of the site.	
Intensity x type of impact	Minimal (1)	Dust emissions will be minimal after mitigation.	
Probability	Unlikely (3)	Unlikely that impact on ambient air quality if mitigation measures are applied.	

Table 8-7: Generation of Power using Diesel Generators (10 MW)

Activity and Interaction (Generation of power leads to gaseous emissions: NOx, SO_2, CO and particulate matter)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality due to gaseous emissions			
Prior to mitigation/ management			
Duration	Medium term (3)	Emissions of gases during construction may last after this phase	Moderate (negative) – 77
Extent	Local (3)	Impact can be felt at a municipal level.	
Intensity x type of impact	Very serious - negative (-5)	Significant release of NOx, SO_2, CO, and particulate matter resulting in changes to ambient atmosphere	
Probability	Definite (7)	It is likely that gases will be released resulting in air pollution	
Mitigation/ Management actions			
▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.			

Activity and Interaction (Generation of power leads to gaseous emissions: NOx, SO_2, CO and particulate matter)			
Dimension	**Rating**	**Motivation**	**Significance**
Post- mitigation			
Duration	Medium term (3)	Emissions of gases during construction	Negligible (negative) – 24
Extent	Limited (2)	Impacts will be limited to the Project site.	
Intensity x type of impact	Moderate - negative (-3)	The concentrations of pollutants emitted will decrease after mitigation	
Probability	unlikely (3)	It is unlikely that emissions will have an effect after mitigation measures are applied	

8.4.1.2 Operational Phase

The results of the pollutant dispersion model (Appendix E) indicate that the predicted 24-hour (daily) PM_{10} concentrations show that the standard is exceeded at the four compass points with the worst cases at the western and southern boundary. In both cases the limit value (75 µg/m³) is exceeded several kilometres from the mine boundary. The major contributions are emissions from hauling and crushing of ore and waste. In terms of spatial impact, the western and south portions are affected most. The predicted concentrations are the likely additions that can be anticipated from the Project on ambient air quality and not cumulative impact from all the existing sources in the area.

The predicted 99th percentile 24-hr (daily) ground level concentration of $PM_{2.5}$ indicates exceedances at the mine boundary hence violating the current standard of 40 µg/m³.

The predicted deposition rate outside the mine boundary is higher than the 1 200 mg/m^2/day (NDCR, 2013) recommended for non-residential areas along the northern, western and southern boundary. Exposure will be higher along the haul road and adjacent areas and around the crushers.

The predicted 1 hour average of NO_2 and SO_2 exceeded the regulatory limits beyond the boundary of the Project site.

As part of the Operational Phase of the Project, the following activities are identified that may impact on the ambient air quality of the area i.e. increasing the concentration of pollutants in the atmosphere:

- Crushing: Waste Rock Crusher/Mine Crushers;
- Hauling: Internal mine roads, haul roads and access roads;
- Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore;
- Mining Processes: Production Shafts and Vent Raises; and
- Generation of power using diesel generators (<10 MW).

Table 8-8: Impacts associated with Crushing

Activity and Interaction (Crushing of ore and waste rock results fugitive dust emissions)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Airborne dust leads to reduced air quality			
Prior to mitigation/ management			
Duration	Project life (5)	Crushing will occur for the Project life	Moderate (negative) – 84
Extent	Municipal (4)	Airborne dust may extend across the development site area.	
Intensity x type of impact	Very serious, long-term environmental impairment - negative (-5)	Emitted concentrations above regulatory guideline	
Probability	Almost certain (6)	Almost certain that impact will occur.	
Mitigation/ Management actions			
▪ Application of dust suppressant or watering of the dirt roads and exposed areas; and ▪ Enclosure for crushers to contain dust levels.			
Post- mitigation			
Duration	Project life (5)	Crushing will occur for the Project life	Negligible (negative) – 27
Extent	Limited (2)	Dust emissions will be limited to the site and its immediate surroundings.	
Intensity x type of impact	Minor - negative (-2)	Environmental damage can be reversed internally.	
Probability	Unlikely (3)	It is unlikely that dust emissions will have an effect after mitigation measures are applied.	

Table 8-9: Impacts associated Hauling: Internal Mine Roads, Haul Roads and Access Roads

Activity and Interaction (Hauling of ore and waste results in reduced air quality			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in the quality of air			
Prior to mitigation/ management			
Duration	Project life (5)	Impact will cease after the operational life span of the Project	Moderate (negative) – 105

Activity and Interaction (Hauling of ore and waste results in reduced air quality			
Dimension	**Rating**	**Motivation**	**Significance**
Extent	Regional (5)	Dust impact will affect the entire region	
Intensity x type of impact	Very serious (5)	Very serious long-term environmental impacts as the standards are exceeded	
Probability	Definite (7)	It is likely that emissions will occur	
Mitigation/ Management actions			
▪ Application of dust suppressant or watering of the dirt roads and exposed areas; and ▪ Set maximum speed limits and have these limits enforced.			
Post- mitigation			
Duration	Project life (5)	Impact will cease after the operational life span of the Project	Negligible (negative) – 30
Extent	Limited (2)	Dust emissions will only occur within and around the Project site.	
Intensity x type of impact	Moderate - negative (-3)	Moderate short term effect	
Probability	Unlikely (3)	It is unlikely that dust emissions will have an effect after mitigation	

Table 8-10: Impacts associated with Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore

Activity and Interaction (Stockpiling will result in dust emissions and reduced air quality)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality			
Prior to mitigation/ management			
Duration	Project life (5)	Dust erosion will throughout the project life	Minor (negative) – 78
Extent	Local (3)	Dust emissions will affect the site and nearby settlements.	
Intensity x type of impact	Very serious long-term negative (-5)	Long term impacts on the environment, as emissions outside the mine boundary are higher than the limit.	
Probability	Highly probable (6)	It is most likely that impacts will occur.	

Activity and Interaction (Stockpiling will result in dust emissions and reduced air quality)			
Dimension	**Rating**	**Motivation**	**Significance**
Mitigation/ Management actions			
▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ Minimise drop heights when loading and offloading material; and ▪ Set maximum speed limits and have these limits enforced.			
Post- mitigation			
Duration	Project life (5)	Dust erosion will occur throughout the project life	Negligible (negative) – 30
Extent	Limited (2)	Limited to the Project site.	
Intensity x type of impact	Moderate - negative (-3)	Moderate impact on air quality	
Probability	unlikely (3)	It is unlikely that fugitive emissions will worsen after mitigation measures are applied.	

Table 8-11: Impacts associated with Mining Process: production Shaft and Vent Raises

Activity and Interaction (Mining processes production shaft and vent raise			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality			
Prior to mitigation/ management			
Duration	Project life (5)	Impact will be for the project life	Minor (negative) – 21
Extent	Limited (2)	Airborne dust limited to project site.	
Intensity x type of impact	Minor - negative (-2)	Minor. Very little change to the baseline.	
Probability	Likely (5)	It is unlikely that dust emissions will have an effect on air quality.	
Mitigation/ Management actions			
▪ Ensure the concentrations of pollutants underground are within occupational exposure limit.			
Post- mitigation			
Duration	Project life (5)	Dust will be generated duration of the operational phase	Negligible (negative) – 27
Extent	Limited (2)	After mitigation measures are	

Activity and Interaction (Mining processes production shaft and vent raise			
Dimension	**Rating**	**Motivation**	**Significance**
		implemented, It is expected that dust impacts will be limited to the project site.	
Intensity x type of impact	Minor - negative (-2)	Generated dust will have minor effect	
Probability	unlikely (3)	Impacts may occur.	

Table 8-12: Impacts associated with the Generation of Power using Diesel Generators

Activity and Interaction (Generation of power leads to gaseous emissions: NOx, SO_2, CO and particulate matter)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality due to gaseous emissions			
Prior to mitigation/ management			
Duration	Project life (5)	Emissions of gases during operational will occur for the project life	Moderate (negative) – 91
Extent	Local (3)	Impact can be felt locally, extending outside the mine boundary.	
Intensity x type of impact	Very serious - negative (-5)	Significant changes of natural or environmental baseline	
Probability	Definite (7)	It is certain that emissions will occur	
Mitigation/ Management actions			
▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.			
Post- mitigation			
Duration	Project life (5)	Emissions of gases during operational phase will occur for the project life	Negligible (negative) – 30
Extent	Limited (2)	Impacts will be limited to the Project site.	
Intensity x type of impact	Moderate - negative (-3)	The area impacted will be minimised after mitigation measures are applied.	
Probability	Unlikely (3)	It is unlikely that emissions will have an effect after mitigation measures are applied	

8.4.1.3 Decommissioning Phase

As part of the Decommissioning Phase, the following activities are identified that may impact on the ambient air quality of the area i.e. increasing particulate matter concentration in the atmosphere:

- Decommissioning and removal of infrastructure; and
- Rehabilitation and sealing of shafts.

Table 8-13: Significance Rating for Demolition of Infrastructure

Activity and Interaction (Demolition of Infrastructure results in dust emission)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduce air quality due to dust emission			
Prior to mitigation/ management			
Duration	Short term (2)	Impact on air quality is limited to the duration of the decommissioning phase	Negligible (negative) – 24
Extent	Limited (3)	Limited to the site and its immediate surroundings	
Intensity x type of impact	Minor (1)	Minor impact is expected	
Probability	Probable (4)	Unlikely that dust will impact on the nearby receptors.	
Mitigation/ Management actions			
▪ The dismantling area disturbed must be kept to a minimum; ▪ Drop heights when offloading materials for rehabilitation must be minimised; and ▪ Limit demolition activities to non-windy days. ▪ Rehabilitation in accordance with rehabilitation plan ▪ Dust suppression on exposed surfaces.			
Post- mitigation			
Duration	Short term (2)	Dust impact will be limited to the duration of the decommissioning phase	Negligible (negative) – 18
Extent	Local (3)	Dust will be limited to project site after mitigation.	
Intensity x type of impact	Minimal (1)	Minimal dust impact	
Probability	Unlikely (3)	Improbable that dust will impact nearby receptors.	

Table 8-14: Significance Rating for Rehabilitation and Sealing of Shafts

Activity and Interaction (Rehabilitation of study area and sealing of shaft will results in dust emission)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality			
Prior to mitigation/ management			
Duration	Medium term (3)	Impact on air quality will be medium term for the duration of the rehabilitation	Minor (negative) – 45
Extent	Local (3)	Limited to the site and its immediate surroundings	
Intensity x type of impact	Moderate short term (3)	Moderate impact is expected	
Probability	Likely (5)	Likely that dust will impact on the nearby receptors.	
Mitigation/ Management actions			
▪ Drop heights should be minimised when offloading materials for rehabilitation; ▪ Limit rehabilitation activities to non-windy days; and ▪ Rehabilitation in accordance with rehabilitation plan; ▪ Dust suppression on exposed surfaces.			
Post- mitigation			
Duration	Medium term (3)	Impact on air quality will be medium term for the duration of the rehabilitation	Negligible (negative) – 18
Extent	Limited (2)	Airborne dust will be limited to the development site area.	
Intensity x type of impact	Minimal (1)	Minimal dust impact	
Probability	Unlikely (3)	Improbable that dust will impact nearby receptors.	

8.4.2 Potential Visual Impacts

The receiving environment of the Project has a **high visual sensitivity** as there are highly visible and potentially sensitive areas in the landscape. This is due to the largely rural sense of place of the receiving environment as well as the proximity of numerous villages, the Witvinger Nature Reserve, Glenesk Private Nature Reserve, Rousseau Snyman Private Nature Reserve, H. L. Crause Private Nature Reserve, Percy Fyfe Nature Reserve and the Makapan Valley WHS Buffer to the Project.

The identified receptors (residents of the villages within 10 km of the mine infrastructure area and road users) of the Project have a **high sensitivity** as they consist of residential areas. The Makapan Valley WHS buffer and the Witvinger Nature Reserve are also sensitive receptors of the Project. Please refer to detailed report in Appendix D.

8.4.2.1 Construction Phase

The construction phase is characterised by site development and infrastructure construction. This includes site clearance and vegetation removal, topsoil removal and stockpiling, surface infrastructure development and drilling and blasting for shafts and vent raises. The establishment of infrastructure and related construction activities will draw attention to the project area making receptors aware of the Project. The construction phase will have negative visual impacts on the receiving environment.

Table 8-15: Potential Impacts of Mine Development

Activity and Interaction (Mine development results in change of land use from agriculture to mining)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place. The waste rock berm and waste rock stockpile will have a permanent and irreversible negative visual impact as the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future. The change in land use will contribute to the cumulative impacts of mining on the regional environment. The visibility of the existing and proposed mines in the region will alter the sense of place of the receiving environment from rural to industrial / mining and result in a loss of scenic character and increased visual disturbance. This impact can potentially be reversed during the decommissioning phase if all infrastructure is removed and the area is rehabilitated.			
Prior to Mitigation / Management			
Duration	Beyond Project Life (6)	The impact will remain for some time after the life of the Project and is potentially irreversible even with management.	Moderate negative (-105)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Irreplaceable Damage or Breakdown (6)	Irreplaceable damage to highly valued items of natural or social significance or breakdown of natural and / or social order.	

Activity and Interaction (Mine development results in change of land use from agriculture to mining)			
Dimension	**Rating**	**Motivation**	**Significance**
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.			
Post-Mitigation			
Duration	Beyond Project Life (6)	The impact will remain for some time after the life of the Project and is potentially irreversible even with management.	Moderate negative (-98)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Very Serious (5)	Very serious widespread natural and / or social baseline changes. Irreparable damage to highly valued items.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Activity and Interaction (Mine development requires site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The removal of vegetation for site clearing will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-70)

Activity and Interaction (Mine development requires site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Serious (4)	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.		
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-63)
Extent	Local (3)	The impact will extend only as far as the development site area.	

Activity and Interaction (Mine development requires site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Activity and Interaction (Mine development requires infrastructure development)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The construction of the headgear and associated shaft infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. These visual impacts will occur until the headgear and associated shaft infrastructure is removed from the site. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place. The visual impacts from the construction area lighting will occur during the construction phase.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Moderate negative (-91)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Very Serious (5)	Very serious widespread natural and / or social baseline changes. Irreparable damage to highly valued items.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Activity and Interaction (Mine development requires infrastructure development)			
Dimension	**Rating**	**Motivation**	**Significance**
Mitigation / Management Actions			
▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Moderate negative (-84)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Serious (4)	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Table 8-16: Potential Impacts of Access / Haul Roads, TSF Pipeline and Stormwater Drains / Berms

Activity and Interaction (Access / haul roads, TSF pipeline and stormwater drains / berms result in change of land use from agriculture to mining)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place. The change in land use will contribute to the cumulative impacts of mining on the regional environment. The visibility of the existing and proposed mines in the region will alter the sense of place of the receiving environment from rural to industrial / mining and result in a loss of scenic character and increased visual disturbance. This impact can potentially be reversed during the decommissioning phase if all infrastructure is removed and the area is rehabilitated.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Moderate negative (-84)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Serious (4)	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Where possible spread topsoil and re-vegetate the servitude areas when construction is complete; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-70)
Extent	Limited (2)	The impact will extend only as far as the development site area.	

Activity and Interaction (Access / haul roads, TSF pipeline and stormwater drains / berms result in change of land use from agriculture to mining)			
Dimension	**Rating**	**Motivation**	**Significance**
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Activity and Interaction (TSF pipeline and stormwater drains require site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The removal of vegetation for site clearing will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	
Extent	Limited (2)	The impact will extend only as far as the development site area.	
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	Minor negative (-56)
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			

Activity and Interaction (TSF pipeline and stormwater drains require site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
▪ Vegetation should only be removed when and where necessary; ▪ Where possible re-vegetate the servitude areas when construction is complete; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; and ▪ Where possible spread topsoil in the servitude areas when construction is complete.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-42)
Extent	Very Limited (1)	The impact is limited to specific isolated parts of the site.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Activity and Interaction (Access / haul roads, TSF pipeline and stormwater drains / berms require infrastructure development)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. These visual impacts will occur until the infrastructure is removed from the site. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place. The visual impacts from the construction area lighting will occur during the construction phase.			

Activity and Interaction (Access / haul roads, TSF pipeline and stormwater drains / berms require infrastructure development)			
Dimension	**Rating**	**Motivation**	**Significance**
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Moderate negative (-77)
Extent	Limited (2)	The impact will extend only as far as the development site area.	
Intensity	Serious (4)	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-63)
Extent	Limited (2)	The impact will extend only as far as the development site area.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

8.4.2.2 Operational Phase

The operational phase is characterised by crushing, hauling, stockpiling and mining processes. The operational phase is expected to have negative visual impacts on the receiving environment.

Table 8-17: Potential Impacts of Crushing

Activity and Interaction (Crushing)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Operation of the waste rock crusher and mine crushers will have a negative visual impact on the receiving environment. Dust from the waste rock crusher and mine crushers will also have a negative visual impact.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-45)
Extent	Limited (2)	The impact is limited to the site and its immediate surroundings.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Likely (5)	The impact may occur. < 65% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Apply dust suppression techniques to limit the dust dispersion from crushing.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Negligible negative (-32)
Extent	Very Limited (1)	The impact is limited to specific isolated parts of the site.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Probable (4)	The impact has occurred here or elsewhere and could therefore occur. < 50% probability	
Nature	Negative		

Table 8-18: Potential Impacts of Internal Mine Roads, Haul Roads, Access Roads and Maintenance Roads

Activity and Interaction (Hauling)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Vehicular activity on internal mine roads, haul roads, access roads and maintenance roads will have a negative visual impact on the receiving environment. Dust from vehicular activity will also have a negative visual impact.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-45)
Extent	Limited (2)	The impact is limited to the site and its immediate surroundings.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Likely (5)	The impact may occur. < 65% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Roads should be wetted frequently by means of a water bowser to suppress dust.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-36)
Extent	Limited (2)	The impact is limited to the site and its immediate surroundings.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Probable (4)	The impact has occurred here or elsewhere and could therefore occur. < 50% probability	
Nature	Negative		

Table 8-19: Potential Impacts of Stockpiling

Activity and Interaction (Stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the waste rock berm and waste rock stockpile will be permanent as the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.			
Prior to Mitigation / Management			
Duration	Permanent (7)	The impact is irreversible, even with management, and will remain after the life of the Project.	Major negative (-112)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Irreplaceable Damage or Breakdown (6)	Irreplaceable damage to highly valued items of natural or social significance or breakdown of natural and / or social order.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Ensure the waste rock berm does not exceed the proposed height of 10 m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.			

Activity and Interaction (Stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Post-Mitigation			
Duration	Permanent (7)	The impact is irreversible, even with management, and will remain after the life of the Project.	Moderate negative (-105)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Very Serious (5)	Very serious widespread natural and / or social baseline changes. irreparable damage to highly valued items.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Table 8-20: Potential Impacts of Mining Processes

Activity and Interaction (Mining Processes)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Operation of the production shafts will have a negative visual impact on the receiving environment. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact. These visual impacts will occur for the life of the Project.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-66)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	
Probability	Almost Certain / Highly Probable (6)	It is most likely that the impact will occur. < 80% probability	
Nature	Negative		
Mitigation / Management Actions			

Activity and Interaction (Mining Processes)			
Dimension	**Rating**	**Motivation**	**Significance**
▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-50)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Likely (5)	The impact may occur. < 65% probability	
Nature	Negative		

8.4.2.3 Decommissioning Phase

The decommissioning phase is characterised by demolition and removal of infrastructure and rehabilitation and sealing of shafts. These activities will have a minor negative visual impact on the receiving environment. Once the decommissioning phase is complete there will be an overall neutral visual impact on the receiving environment which will assist to return the project area to a state similar to the pre-mining state.

It was assumed that the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts.

Table 8-21: Potential Impacts of Demolition and Removal of All Infrastructure

Activity and Interaction (Demolition and removal of all infrastructure)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Demolition and removal of infrastructure will have a minor negative visual impact on the receiving environment. Once the infrastructure is removed, there will be an overall neutral visual impact on the receiving environment. This will help to reverse some of the changes that occurred when the infrastructure was constructed.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-56)

Activity and Interaction (Demolition and removal of all infrastructure)			
Dimension	**Rating**	**Motivation**	**Significance**
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Apply dust suppression techniques to limit the dust from the demolition area; and ▪ Limit the quantity of rubble stored on site.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-42)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Minimal (1)	Minimal natural and / or social impacts, low-level replaceable damage with no change to the baseline.	
Probability	Almost Certain / Highly Probable (6)	It is most likely that the impact will occur. < 80% probability	
Nature	Negative		

Table 8-22: Potential Impacts of Rehabilitation and Sealing of Shafts

Activity and Interaction (Rehabilitation of disturbed areas)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Rehabilitation of disturbed areas will have a minor negative visual impact on the receiving environment. Once the rehabilitation is complete, there will be an overall neutral visual impact on the receiving environment. This will assist to return the project area to a state similar to the pre-development state.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-63)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-48)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	

Activity and Interaction (Rehabilitation of disturbed areas)			
Dimension	**Rating**	**Motivation**	**Significance**
Probability	Almost Certain / Highly Probable (6)	It is most likely that the impact will occur. < 80% probability	
Nature	Negative		

Activity and Interaction (Sealing of shafts)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Sealing of shafts will have a negative visual impact on the receiving environment. Once the shafts are sealed and rehabilitation is complete, there will be a neutral visual impact on the receiving environment.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-42)
Extent	Very Limited (1)	The impact is limited to specific isolated parts of the site.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Negligible negative (-30)
Extent	Very Limited (1)	The impact is limited to specific isolated parts of the site.	
Intensity	Minimal (1)	Minimal natural and / or social impacts, low-level replaceable damage with no change to the baseline.	

Activity and Interaction (Sealing of shafts)			
Dimension	**Rating**	**Motivation**	**Significance**
Probability	Almost Certain / Highly Probable (6)	It is most likely that the impact will occur. < 80% probability	
Nature	Negative		

8.4.3 Potential Impacts on Ambient Noise Levels

8.4.3.1 Construction Phase

The Construction Phase involves the following activities that may impact on the ambient noise levels:

- Mine development: Headgear, sinking shafts and vent raises;
- Construction of access/haul roads and storm water drains/berms; and
- Distribution of power using diesel generators (<10 MW).

The noise dispersion model run for the construction phase indicates that the expected noise will measure above the pre-mining baseline at the surrounding communities by 7dBA or more but mainly impact on the communities along the boundary of the project site. Please refer to the detailed report in Appendix H.

Table 8-23: Significance Ratings for Impacts on Noise during the Construction Phase

Dimension	Rating	Motivation	Significance
Activity and Interaction (Site clearance and vegetation removal as well as construction of headgear, shaft, haul roads, storm water drain, pipeline and booster pump station			
Impact Description: Noise will emanate from the machinery and vehicles operating during the construction activities such as development of headgear and shaft as well as power generation by the on-site generator.			
Prior to mitigation/ management			
Duration	Medium term (3)	Noise will be produced for the duration of the construction phase	Minor (negative) – 66
Extent	Beyond site (4)	It is expected that during construction noise will extend beyond the development site area	
Intensity x type of impact	Serious - negative (-4)	It is expected that during construction noise will have a serious impact	
Probability	Highly probable (6)	It is almost certain that noise will impact on the surrounding receptors	
Nature	Negative		

Dimension	Rating	Motivation	Significance
Mitigation/ Management action			
▪ Restricting construction activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; ▪ Switching off equipment when not in use; and ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence.			
Post- mitigation			
Duration	Medium term (3)	Noise will be produced for the duration of the construction phase	Minor (negative) – 36
Extent	Beyond site (4)	It is expected that during construction noise will extend beyond the development site area	
Intensity x type of impact	Minor - negative (-2)	It is expected that during construction noise will have a minor impact	
Probability	Unlikely (4)	Unlikely of noise causing disturbance with mitigation	
Nature	Negative		

8.4.3.2 Operational Phase

The Operational Phase involves the following activities that may impact on the ambient noise levels:

- Crushing waste rock;
- Hauling: Internal haul roads and access roads;
- Stockpiling: Waste rock berm, waste rock stockpile, high grade and low grade ore;
- Mining processes: Production shaft and vent raises;
- Operation of booster pump station; and
- Generation of power using diesel generators.

The noise dispersion model run for the operational phase day and night time periods indicates that the expected noise will measure above the SANS 10103:2008 day and night time rating levels (50 dBA and 40 dBA) as well as measure above the pre-mining baseline day and night time levels at the surrounding suburban receptors but mainly impact on the communities located along the boundaries of the project site. Based on the definition of disturbing noise in the Noise Regulations there will be disturbance where the levels reach 7dBA and more above the pre-mining baseline.

The noise levels from the proposed mining activities are expected to measure 7dBA and more above the baseline levels at Ga-Kgobudi, Sekgoboko, Mgongoa, and Ga-Kgobudi 2 (Mzombane), however the noise will not impact on the communities in their entirety. The surrounding communities are mainly impacted due to their proximity to the Ivanplats boundary fence. The models indicate the noise levels will be between 55dbA and 60dBA which is between 7dBA and 12dBA higher than the existing baseline. According to the SANS 10103:2008 categories of community/group response guidelines, there is likely to be a medium to strong response towards the noise from the mine.

Table 8-24: Significance Ratings for Impacts on Noise during the Operational Phase

Dimension	Rating	Motivation	Significance
Activity and Interaction (operational activities such as mining process, hauling, stockpiling and power generation)			
Impact Description: Noise will emanate from the machinery and vehicles operating during the operational phase such as the crushing circuit, hauling of ore on surface, continuous stockpiling and shaping of waste rock dump and over burden stockpiles as well the use of generators.			
Prior to mitigation/ management			
Duration	Project life (5)	Noise will be produced for the duration of the operational phase	Moderate (negative) – 78
Extent	Beyond site (4)	It is expected that during operation noise will extend as far as development site area	
Intensity x type of impact	Serious - negative (-4)	It is expected that during operation noise will have a serious impact	
Probability	Highly probable (6)	It is highly probable that noise will impact on the surrounding receptors	
Nature	Negative		
Mitigation/ Management action			
▪ Locating of diesel generator away from noise sensitive receptors, as well as placing generators on isolation mounts and installation secondary silencers; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; ▪ Switching off equipment when not in use; and ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence.			
Post- mitigation			
Duration	Project life (5)	Noise will be produced for the duration of the operational phase	Minor (negative) – 44
Extent	Beyond site (4)	It is expected that during operation noise will extend beyond the development site area.	

Dimension	Rating	Motivation	Significance
Intensity x type of impact	Minor - negative (-2)	It is expected that during operation noise will have a minor impact	
Probability	Unlikely (4)	Unlikely of noise causing disturbance	
Nature	Negative		

8.4.3.3 Decommissioning Phase

The Decommissioning Phase involves the following activities that may impact on the ambient noise levels:

- Demolition and removal of all infrastructure; and
- Rehabilitation and sealing shafts.

The impact during the decommissioning phase is expected to be lower than both that of the construction and operational phases due to the limited activities, therefore it is probable that the noise from the decommissioning phase will not impact on the surrounding communities.

Table 8-25: Significance Ratings for Impacts on Noise during the Decommissioning Phase

Dimension	Rating	Motivation	Significance
Activity and Interaction (Site clearance and vegetation removal for the CPP, RTSF an pipeline)			
Impact Description: Noise will emanate from the machinery and vehicles operating during the decommissioning activities.			
Prior to mitigation/ management			
Duration	Medium term (3)	Noise will be produced for the duration of the decommissioning phase	Negligible (negative) – 21
Extent	Local (3)	It is expected that during decommissioning noise will extend as far as development site area	
Intensity x type of impact	Minimal - negative (-1)	It is expected that during decommissioning noise will have a minimal impact	
Probability	Unlikely (3)	It is unlikely that noise will impact on the surrounding receptors	
Nature	Negative		
Mitigation/ Management action			

Dimension	Rating	Motivation	Significance
▪ Restricting decommissioning activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; ▪ Switching off equipment when not in use; and ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence.			
Post- mitigation			
Duration	Medium term (3)	Noise will be produced for the duration of the decommissioning phase	Negligible (negative) – 14
Extent	Local (3)	It is expected that during decommissioning noise will be limited to site if mitigation measures are implemented	
Intensity x type of impact	Minimal - negative (-1)	It is expected that during decommissioning noise will have a minimal social impact	
Probability	Rare (2)	It is improbable that noise will impact on the surrounding receptors.	
Nature	Negative		

8.4.4 Potential Impacts on Heritages Resources

8.4.4.1 Impacts to Burial Grounds and Graves

Heritage impacts on burial grounds and graves located within or in proximity to the proposed linear infrastructure will manifest as either changes to the physical integrity of the sites due to certain activities, or changes to the intangible nature of the burial grounds from restricted and / or loss of access.

Physical changes to burial grounds and graves will occur as a result of activities associated with the construction phase of the Project. The construction activities may include site clearance, topsoil removal and construction of the linear infrastructure. Intangible changes will occur as a result of the inherent access restrictions that will apply to the mining area in general. Restricted or loss of access impacts on the ability of descendants and family members, or other persons or communities who by tradition are concerned with graves, to express their living heritage as it may pertain to graves and associated ancestral rites.

Both physical and intangible impacts may result in unplanned events such as the degradation of the intrinsic cultural significance of gravesites, as well as social repercussions. In addition, there are inherent health and safety risks associated with access to operating mine properties by visitors.

Table 8-26: Physical Impacts to Burial Grounds and Graves

IMPACT DESCRIPTION: Physical impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Permanent (7)	Destruction of burial grounds and graves through construction activities will be permanent	Consequence: Extremely detrimental (-20)	Significance: Major - negative (-140)
Extent	National (6)	Unmitigated alteration to the status quo of known burials will have repercussions to Next-of-Kin (NoK) and the reputation of Ivanplats. In addition, unmitigated changes to burials will result in the involvement of local, provincial and national authorities, as well as potentially national media attention		
Intensity x type of impact	Extremely high - negative (-7)	This will be a major change to a resource with very high significance		
Probability	Certain (7)	Without mitigation, the identified impact is certain to occur		
MITIGATION				
The newly identified burial grounds and graves must be subject to a burial grounds consultation and relocation process. The current consultation and relocation process could be extended to include these graves. The consultation process is regulated by Chapter XI of the NHRA regulations that aim to: ▪ Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves; ▪ Consult with identified stakeholders regarding the effect of the Project on graves; and ▪ Reach agreement with stakeholders on the future of identified graves, to retain sites in situ or exhume, relocate and reinter the contents of the graves. Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.			

IMPACT DESCRIPTION: Physical impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
POST-MITIGATION				
Duration	Beyond project life (6)	The impact will extend beyond the project life, specifically if graves are relocated	Consequence: Moderately detrimental (-13)	Significance: Moderate - negative (-78)
Extent	Limited (2)	The extent of the impact will be limited to specific burial grounds and identified NoK		
Intensity x type of impact	High - negative (-5)	The mitigation will result in a minor change to a heritage resource with very high significance. Grave relocation is inherently negative, as the physical and social contexts of graves are destroyed through the act of exhumation and relocation. In terms of in situ conservation, loss or restricted access will still negatively affect the graves and persons associated.		
Probability	Highly probable (6)	It is probable that mitigation measures will reduce the consequence of the identified impact.		

Table 8-27: Summary of Intangible Impacts to Burial Grounds and Graves

IMPACT DESCRIPTION: Intangible impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Project Life (5)	Intangible impacts to burial grounds will occur throughout the life of the Project	Consequence: Highly detrimental (-16)	Significance: Moderate - negative (-80)
Extent	National (6)	Social repercussions resulting from unmitigated changes to graves could affect at the very least descendant communities residing in the region. In addition, unmitigated changes to graves will result in the involvement of local, provincial and national authorities, as well as potentially national media attention.		
Intensity x type of impact	High - negative (-5)	The intensity of the intangible impacts will result in a moderate change to burial grounds and graves		
Probability	Likely (5)	if unmitigated, it is likely that identified intangible impacts will manifest		
MITIGATION				

<table>
<tr><th colspan="6">IMPACT DESCRIPTION: Intangible impacts to burial grounds and graves</th></tr>
<tr><td>Predicted for project phase:</td><td>Pre-construction</td><td>Construction</td><td>Operation</td><td colspan="2">Decommissioning</td></tr>
<tr><td>Dimension</td><td>Rating</td><td colspan="4">Motivation</td></tr>
<tr><td colspan="6">Where in situ preservation is possible, redesign of development footprints to exclude graves from the development footprint must be considered. A buffer of at least 15m from any linear infrastructure footprints must be maintained. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.
Consultation, as part of the current process being undertaken, will still be required to reach agreement on the in situ conservation, including access requirements.
The results of the consultation and any agreements reached must be encapsulated in the CMP currently being compiled.</td></tr>
<tr><td colspan="6">POST-MITIGATION</td></tr>
<tr><td>Duration</td><td>Project Life (5)</td><td>As for pre-mitigation</td><td rowspan="3">Consequence: Highly beneficial (15)</td><td rowspan="4">Significance: Moderate - positive (75)</td></tr>
<tr><td>Extent</td><td>Municipal Area (4)</td><td>Agreements must involve at the very least the local municipality.</td></tr>
<tr><td>Intensity x type of impact</td><td>Very high - positive (6)</td><td>Loss of or restricted access to in situ burial grounds will still negatively affect associated NoK. However, through the development and implementation of the CMP in consultation with the NoK and communities, the intrinsic CS of burial sites can be preserved through the expressions of living heritage</td></tr>
<tr><td>Probability</td><td>Likely (5)</td><td colspan="2">Mitigation will ensure that grave sites are conserved in situ according to the requirements of affected communities, and within legal requirements. This will ensure that the CS of gravesites is enhanced through sustainable use by affected communities.</td></tr>
</table>

8.5 Item 3(g)(vi): Methodology used in determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks

Details of the impact assessment methodology used to determine the significance of physical, bio-physical and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

Significance = CONSEQUENCE X PROBABILITY X NATURE

Where

Consequence = intensity + extent + duration

And

Probability = likelihood of an impact occurring

And

Nature = positive (+1) or negative (-1) impact

The matrix calculates the rating out of 147, whereby intensity, extent, duration and probability are each rated out of seven as indicated in Table 8-29. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation has been applied; post-mitigation is referred to as the residual impact. The significance of an impact is determined and categorised into one of seven categories (The descriptions of the significance ratings are presented in Table 8-30Table 8-28).

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, (i.e., there may already be some mitigation included in the engineering design). If the specialist determines the potential impact is still too high, additional mitigation measures are proposed.

Table 8-28: Impact Assessment Parameter Ratings

Rating	Intensity/Replicability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
7	Irreplaceable loss or damage to biological or physical resources or **highly** sensitive environments. Irreplaceable damage to **highly sensitive** cultural/social resources.	Noticeable, on-going natural and / or social benefits which have improved the overall conditions of the baseline.	International The effect will occur across international borders.	Permanent: The impact is irreversible, even with management, and will remain after the life of the project.	Definite: There are sound scientific reasons to expect that the impact will definitely occur. >80% probability.
6	Irreplaceable loss or damage to biological or physical resources or **moderate to highly** sensitive environments. Irreplaceable damage to cultural/social resources of **moderate to highly** sensitivity.	Great improvement to the overall conditions of a large percentage of the baseline.	National Will affect the entire country.	Beyond project life: The impact will remain for some time after the life of the project and is potentially irreversible even with management.	Almost certain / Highly probable: It is most likely that the impact will occur. <80% probability.
5	Serious loss and/or damage to physical or biological resources or **highly** sensitive environments, limiting ecosystem function. Very serious widespread social impacts. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	Province/ Region Will affect the entire province or region.	Project Life (>15 years): The impact will cease after the operational life span of the project and can be reversed with sufficient management.	Likely: The impact may occur. <65% probability.
4	Serious loss and/or damage to physical or biological resources or **moderately** sensitive environments, limiting ecosystem function. On-going serious social issues. Significant damage to structures / items of cultural significance.	Average to intense natural and / or social benefits to some elements of the baseline.	Municipal Area Will affect the whole municipal area.	Long term: 6-15 years and impact can be reversed with management.	Probable: Has occurred here or elsewhere and could therefore occur. <50% probability.
3	Moderate loss and/or damage to biological or physical resources of **low to moderately** sensitive environments and, limiting ecosystem function. On-going social issues. Damage to items of cultural significance.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	Local Local extending only as far as the development site area.	Medium term: 1-5 years and impact can be reversed with minimal management.	Unlikely: Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur. <25% probability.

Rating	Intensity/Replicability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
2	**Minor loss and/or effects** to biological or physical resources or low sensitive environments, not affecting ecosystem functioning. Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Low positive impacts experience by a small percentage of the baseline.	Limited Limited to the site and its immediate surroundings.	Short term: Less than 1 year and is reversible.	Rare / improbable: Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures. <10% probability.
1	**Minimal to no loss** and/or effect to biological or physical resources, not affecting ecosystem functioning. Minimal social impacts, low-level repairable damage to commonplace structures.	Some low-level natural and / or social benefits felt by a very small percentage of the baseline.	Very limited/Isolated Limited to specific isolated parts of the site.	Immediate: Less than 1 month and is completely reversible without management.	Highly unlikely / None: Expected never to happen. <1% probability.

Table 8-29: Probability / Consequence Matrix

Significance																																						
-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Consequence																																						

Table 8-30: Significance Rating Description

Score	Description	Rating
109 to 147	A very beneficial impact that may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change	Major (positive) (+)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the (natural and / or social) environment	Moderate (positive) (+)
36 to 72	An positive impact. These impacts will usually result in positive medium to long-term effect on the natural and / or social environment	Minor (positive) (+)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the natural and / or social environment	Negligible (positive) (+)
-3 to -35	An acceptable negative impact for which mitigation is desirable. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural and / or social environment	Negligible (negative) (-)
-36 to -72	A minor negative impact requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the natural and / or social environment	Minor (negative) (-)
-73 to -108	A moderate negative impact may prevent the implementation of the project. These impacts would be considered as constituting a major and usually a long-term change to the (natural and / or social) environment and result in severe changes.	Moderate (negative) (-)
-109 to -147	A major negative impact may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts are likely to be irreversible and/or irreplaceable.	Major (negative) (-)

8.6 Item 3(g)(vii): The Positive and Negative Impacts that the Proposed Activity (in terms of the Initial Site Layout) and Alternatives will have on the Environment and the Community that may be affected

The positive and negative impacts associated with the Platreef Mine were detailed in the EIA Report compiled in 2013. The positive and negative impacts associated with the amendment activities including the reduced mine infrastructure footprint are discussed below.

The reduction in footprint of the mine infrastructure area has resulted in both positive and negative impacts for the surrounding communities particularly. The heights of infrastructure has increased, i.e. the headgear of Shaft No. 2 and the stockpiles and additional infrastructure has now been included such as the diesel generator sets. These amendments have a cumulative negative impact on the surrounding communities:

- Impacting the visual/aesthetic character of the site;
- Deteriorating the quality of air in the study area;
- Cumulative noise impacts;
- Impacts to heritage resources/graves; and
- Safety impacts to the communities (i.e. blasting).

There are several positive impacts associated with the Project including employment, skills development, local economic development, to name a few. These impacts are still relevant to this amendment process.

Positive impacts that the proposed amendments have include the maintenance of a buffer between the Project activities on the mine and the surrounding communities. This buffer aids in reducing the negative nuisance impacts such as dust and noise emissions. Furthermore, the site layout does make provision for a 10 m high WRB which serves as a visual and safety barrier to the surrounding communities.

8.7 Item 3(g)(viii): The possible Mitigation Measures that could be applied and the Level of Risk

The potential impacts and mitigation measures as proposed in Section 8.4 are briefly presented below.

Table 8-31: Proposed Mitigation Measures

Potential Impact	Mitigation Type
Deterioration of air quality	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing or digging must occur. ▪ Drop heights when loading and offloading material should be minimised. ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced. ▪ Ensure generators are working at optimal conditions. ▪ Fitting of gas scrubbers on generators. ▪ Use of low sulphur diesel in mine equipment and generators. ▪ Fitting electrostatic precipitators on generators. ▪ Enclosure for crushers to contain dust levels. ▪ Ensure the concentrations of pollutants underground are within occupational exposure limit. ▪ Limit demolition and rehabilitation activities to non-windy days during closure. ▪ Rehabilitated landscape should be vegetated.
Physical changes to burial grounds and graves	▪ The newly identified burial grounds and graves must be included in the current consultation and relocation process. The consultation process is regulated by Chapter XI of the NHRA regulations that aim to: o Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves; o Consult with identified stakeholders regarding the effect of the Project on graves; and o Reach agreement with stakeholders on the future of identified graves, to retain sites in situ or exhume, relocate and reinter the contents of the graves. Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that Chance Find Procedures (CFPs) be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.

Potential Impact	Mitigation Type
Intangible Impacts to Burial Grounds and Graves	▪ Where in situ preservation is possible, redesign of development footprints to exclude graves from the development footprint must be considered. A buffer of at least 15m from any linear infrastructure footprints must be maintained. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources. ▪ Consultation, as part of the current process being undertaken, will still be required to reach agreement on the in situ conservation, including access requirements. The results of the consultation and any agreements reached must be encapsulated in the CMP currently being compiled.
Noise emissions	▪ Restricting construction activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays. ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly. ▪ Switching off equipment when not in use. ▪ Locating of diesel generator away from noise sensitive receptors.
Visual impacts	▪ Vegetation should only be removed when and where necessary. ▪ Where possible re-vegetate the servitude areas when construction is complete. ▪ Topsoil should only be removed when and where necessary. ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape. ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles. ▪ Where possible spread topsoil in the servitude areas when construction is complete. ▪ Use shade cloth / netting to screen the construction site. ▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible. ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used. ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established. ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution. ▪ Ensure the waste rock berm does not exceed the proposed height of 10 m. ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m. ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the

Potential Impact	Mitigation Type
	stockpiles and reduce dust generation. ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained. ▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography. ▪ Re-vegetate the rehabilitated areas. ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.

8.8 Item 3(g)(ix): Motivation where No Alternatives Sites were considered

It is recognised that in some cases, an alternative location or site cannot be considered due to the nature of the project. Since mining and extraction can only occur at the location of an ore body, it is not feasible to consider alternative locations. In the case of this Project, the proposed amendment falls within the approved mining right area and involves a reduction in the footprint of the mine infrastructure area only. The overall feasibility of the Project, particularly the location of the mine has been proved through the Pre-Feasibility Study (PFS) concluded in 2013. Furthermore, Ivanplats has commenced with the construction of the mine and sinking of Shaft No. 1.

No alternative locations have been identified or assessed in this EIA Addendum Report as it would not meet the overall objective of the Project, which is ultimately to allow Ivanplats to mine the Platinum resource located below the current mine location.

8.9 Item 3(g)(x): Statement Motivating the Alternative Development Location within the Overall Site

As part of the amendment process, the site layout for the mine infrastructure area had been revised to accommodate for the reduced footprint area. In particular, structures within the mine infrastructure area were re-positioned to optimise the space available (now 345 ha). This reduction of the footprint and re-positioning of infrastructure was necessary to control the potential impacts and risks associated with the community's proximity to the project site.

9 Item 3(h): Full Description of the Process undertaken to Identify, Assess and Rank the Impacts and Risks the Activity will impose on the Preferred Site (In respect of the Final Site Layout Plan) through the Life of the Activity

Please refer to Section 0 above for a description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site.

Please refer to Section 10 below for a description of all environmental issues and risks that were identified during the environmental impact assessment process.

10 Item 3(i): Assessment of each Identified Potentially Significant Impact and Risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties)

Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance (Post Mitigation)
Site clearing of infrastructure footprint	Dust generation	Air Quality	Construction	Negligible (negative) – 35	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing or digging must occur; and ▪ Drop heights when loading and offloading material should be minimised.	Negligible (negative) – 21
Construction of access / haul roads and stormwater drains / berms	Reduction in air quality	Air Quality	Construction	Minor (negative) – 42	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging or scraping must occur; and ▪ The drop heights when loading onto trucks and at tipping points should be minimised.	Negligible (negative) – 12
Generation of power using diesel generators (10 MW)	Reduction in air quality due to gaseous emissions	Air Quality	Construction	Moderate (negative) – 77	▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.	Negligible (negative) – 24
Crushing	Airborne dust leads to reduced air quality	Air Quality	Operational	Moderate (negative) – 84	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; and ▪ Enclosure for crushers to contain dust levels.	Negligible (negative) – 27
Hauling: Internal Mine Roads, Haul Roads and Access Roads	Reduction in the quality of air	Air Quality	Operational	Moderate (negative) – 105	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; and ▪ Set maximum speed limits and have these limits enforced.	Negligible (negative) – 30
Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	Reduction in the quality of air	Air Quality	Operational	Moderate (negative) – 78	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ Minimise drop heights when loading and offloading material; and ▪ Set maximum speed limits and have these limits enforced.	Negligible (negative) – 30
Mining Process: production Shaft and Vent Raises	Reduction in the quality of air	Air Quality	Operational	Minor (negative) – 45	▪ Ensure the concentrations of pollutants underground are within occupational exposure limit.	Negligible (negative) – 27
Generation of Power using Diesel Generators	Reduction in air quality due to gaseous emissions	Air Quality	Operational	Moderate (negative) – 91	▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.	Negligible (negative) – 30

Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance (Post Mitigation)
Demolition of Infrastructure	Reduce air quality due to dust emission	Air Quality	Decommissioning	Negligible (negative) – 24	▪ The dismantling area disturbed must be kept to a minimum; ▪ Drop heights when offloading materials for rehabilitation must be minimised; and ▪ Limit demolition activities to non-windy days. ▪ Rehabilitation in accordance with rehabilitation plan ▪ Dust suppression on exposed surfaces.	Negligible (negative) – 18
Rehabilitation and Sealing of Shafts	Reduction in air quality	Air Quality	Decommissioning	Minor (negative) – 45	▪ Drop heights should be minimised when offloading materials for rehabilitation; ▪ Limit rehabilitation activities to non-windy days; ▪ Rehabilitation in accordance with rehabilitation plan; and ▪ Dust suppression on exposed surfaces.	Negligible negative) – 18
Site clearance and construction activities	Physical changes to burial grounds and graves	Cultural Heritage	Construction	Major - negative (-140)	The newly identified burial grounds and graves must be subject to a burial grounds consultation and relocation process. The current consultation and relocation process could be extended to include these graves. The consultation process is regulated by Chapter XI of the NHRA regulations that aim to: ▪ Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves; ▪ Consult with identified stakeholders regarding the effect of the Project on graves; and ▪ Reach agreement with stakeholders on the future of identified graves, to retain sites in situ or exhume, relocate and reinter the contents of the graves. Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources	Moderate - negative (-78)
Mine development and processes	Intangible Impacts to Burial Grounds and Graves	Cultural Heritage	Construction, Operational and Decommissioning	Moderate - negative (-80)	Where in situ preservation is possible, redesign of development footprints to exclude graves from the development footprint must be considered. A buffer of at least 15m from any linear infrastructure footprints must be maintained. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources. Consultation, as part of the current process being undertaken, will still be	Significance: Moderate - positive (75)

Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance (Post Mitigation)
					required to reach agreement on the in situ conservation, including access requirements. The results of the consultation and any agreements reached must be encapsulated in the CMP currently being compiled.	
Site clearance and vegetation removal as well as construction of headgear, shaft, haul roads, storm water drain, pipeline and booster pump station	Noise will emanate from the machinery and vehicles operating during the construction activities	Ambient Noise	Construction	Minor (negative) – 66	▪ Restricting construction activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; and ▪ Switching off equipment when not in use; and ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence.	Minor (negative) – 36
Operational activities such as mining process, hauling, stockpiling and power generation	Noise from the machinery and vehicles operating crushing circuit, hauling of ore on surface, continuous stockpiling and shaping of waste rock dump and over burden stockpiles as well the use of generators	Ambient Noise	Operation	Moderate (negative) – 78	▪ Locating of diesel generator away from noise sensitive receptors; ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence. ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; and ▪ Switching off equipment when not in use.	Minor (negative) – 44
Demolish and remove site infrastructure	Noise from the machinery and vehicles operating during the decommissioning activities.	Ambient Noise	Decommissioning	Negligible (negative) – 21	▪ Restricting decommissioning activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence. ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly. ▪ Switching off equipment when not in use.	Negligible (negative) – 14
Mine development results in change of land use from agriculture to mining	The change of land use from agriculture to mining will have a negative visual impact on the receiving environment	Visual	Construction	Moderate negative (-105)	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	Moderate negative (-98)
Site clearance and vegetation removal for TSF pipeline and stormwater drains	Infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas.	Visual	Construction	Minor negative (-70)	▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from	Minor negative (-63)

Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance (Post Mitigation)
					stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.	
Mine development requires drilling and blasting for sinking shafts and vent raises	Drilling and blasting for shafts and vent raises will have a negative visual impact on the receiving environment. Dust from blasting will also have a negative visual impact.	Visual	Construction	Minor negative (-63)	▪ Apply dust suppression techniques to limit the dust dispersion from blasting.	Minor negative (-48)
Mine development requires infrastructure development	The construction of the headgear and associated shaft infrastructure will have a negative visual impact on the receiving environment.	Visual	Construction	Moderate negative (-91)	▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	Moderate negative (-84)
Access / haul roads, TSF pipeline and stormwater drains / berms require infrastructure development)	The construction of surface infrastructure will have a negative visual impact on the receiving environment	Visual	Construction	Moderate negative (-77)	▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	Minor negative (-63)

Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance (Post Mitigation)
Crushing	Dust from the waste rock crusher and mine crushers will also have a negative visual impact.	Visual	Operational	Minor negative (-45)	▪ Apply dust suppression techniques to limit the dust dispersion from crushing.	Negligible negative (-32)
Hauling	Dust from vehicular activity will also have a negative visual impact	Visual	Operational	Minor negative (-45)	▪ Roads should be wetted frequently by means of a water bowser to suppress dust	Minor negative (-36)
Stockpiling	Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact	Visual	Operational	Major negative (-112)	▪ Ensure the waste rock berm does not exceed the proposed height of 10 m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.	Moderate negative (-105)
Mining Processes	Operation of the production shafts will have a negative visual impact on the receiving environment. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact. These visual impacts will occur for the life of the Project.	Visual	Operational	Minor negative (-66)	▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night.	Minor negative (-50)
Demolition and removal of all infrastructure	Demolition and removal of infrastructure will have a minor negative visual impact on the receiving environment	Visual	Decommissioning	Minor negative (-56)	▪ Apply dust suppression techniques to limit the dust from the demolition area; ▪ Limit the quantity of rubble stored on site.	Minor negative (-42)

Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance (Post Mitigation)
Rehabilitation of disturbed areas	Rehabilitation of disturbed areas will have a minor negative visual impact on the receiving environment	Visual	Decommissioning	Minor negative (-63)	▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	Minor negative (-48)
Sealing of shafts	Sealing of shafts will have a negative visual impact on the receiving environment. Once the shafts are sealed and rehabilitation is complete, there will be a neutral visual impact on the receiving environment.	Visual	Decommissioning	Minor negative (-42)	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	Negligible negative (-30)

The supporting Air Quality, Visual, Noise and Heritage Addendum Assessment reports are attached as Appendix D to Appendix H.

11 Item 3(j): Summary of Specialist Reports

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included
Air Quality Impact Assessment	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing or digging must occur; ▪ Drop heights when loading and offloading material should be minimised; ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced; ▪ Ensure generators are working at optimal conditions; ▪ Enclosure for crushers to contain dust levels; and ▪ Limit demolition activities to non-windy days	X (detailed mitigation measures are included in Part B)	Appendix E and Part B
Noise Impact Assessment	▪ Restricting construction and decommissioning activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; ▪ Switching off equipment when not in use; and ▪ Locating of diesel generator away from noise sensitive receptors.	X (detailed mitigation measures are included in Part B)	Appendix H and Part B
Visual Impact Assessment	▪ Apply dust suppression techniques to limit the dust dispersion from crushing; ▪ Roads should be wetted frequently by means of a water bowser to suppress dust; ▪ Ensure the waste rock berm does not exceed the proposed height of 10m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; ▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night; ▪ Limit the quantity of rubble stored on site; ▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	X (detailed mitigation measures are included in Part B)	Appendix D and Part B

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included
Heritage Impact Assessment	▪ The newly identified burial grounds and graves must be included in the current consultation and relocation process. ▪ Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. ▪ Where in situ preservation is possible, redesign of development footprints to exclude graves from the development footprint must be considered. A buffer of at least 15m from any linear infrastructure footprints must be maintained. ▪ Consultation, as part of the current process being undertaken, will still be required to reach agreement on the in situ conservation, including access requirements. ▪ It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources	X (detailed mitigation measures are included in Part B)	Appendix F and Part B

12 Item 3(k): Environmental Impact Statement

12.1 Item 3(k)(i): Summary of the Key Findings of the Environmental Impact Assessment

12.1.1 Air Quality Assessment

The main findings of the study can be summarised as follows:

- Daily PM_{10} - Predicted maximum daily concentrations are found to exceed the current daily standard of 75 µg/m^3 without mitigation measures in place in the area.
- PM_{10} – Predicted annual concentrations at 100th percentile is below the current standard except PF6 (63 µg/m^3).
- $PM_{2.5}$ – The daily concentrations in the study area are higher than the current South African standards (65 µg/m^3).
- $PM_{2.5}$ – Predicted annual concentrations at 100th percentile did not exceed the current South African limit. Only site PF6 (63 µgm^3) was in exceedance of the standard.
- Dust Deposition – dust deposition rates predicted for the proposed Platreef Mine are high coupled with emissions from dirt roads due to hauling. However, model predictions shows that only site PF6 will be in exceedance.
- The predicted NOx concentrations simulated at the proposed mining area are high due to the use of the diesel generator set. The hourly concentration exceeded the current limit for some 1.4 km from the western boundary and 628 m from the project boundary.
- NO_2 – Predicted annual concentrations did not exceed the existing South African standard (40 µg/m3), within the study area and beyond.
- The 1-hour SO_2 concentrations predicted at the proposed mining area are below the recommended South African standard of 350 µg/m^3.
- The 24-hours - Predicted SO_2 concentrations are within the South African standard of 125 µg/m^3. Concentrations at sensitive receptors were within limit.
- CO– Predicted maximum hourly concentrations are within the regulatory limit value. No exceedance of the South African standard of 30,000 µg/m^3 was predicted.

12.1.2 Noise Assessment

The proposed amendments and its associated activities are expected to cause a noise disturbance as contemplated in the Noise Regulations at the surrounding communities of Ga-Kgobudi, Sekgoboko, Ga-Magongoa and Ga-Kgobudi 2 (Mzombane). The noise impact will mainly be on the communities located along the boundary fence, where the mining activities will measure in excess of 7dBA and more at certain distances into the surrounding communities. According to the SANS 10103:2008 categories of community/group response guidelines, there is likely to be a medium to strong response towards the noise from the mine.

The overall calculated severity of the noise impact during the construction, operational and decommissioning phase is minor negative, moderate negative and minor negative respectively.

The significance of the impact from the initial noise assessment compared to the addendum assessment has increased due to the location amendments of infrastructure as well as the result of the close proximity of the surrounding communities.

12.1.3 Heritage Assessment

A total of seven heritage resources were identified during a pre-disturbance survey of the development footprint of the TSF pipeline and storm water drain. These included six burial grounds and graves, and one LFC site. The LFC site (St-005) was assigned a negligible CS and deemed to have been sufficiently recorded.

Heritage impacts on burial grounds and graves located within or in proximity to the proposed linear infrastructure will manifest as either changes to the physical integrity of the sites due to certain activities, or changes to the intangible nature of the burial grounds from restricted and / or loss of access. Both of which are considered to be negative impacts.

Physical changes to burial grounds and graves will occur as a result of activities associated with the construction phase of the Project. Intangible changes will occur as a result of the inherent access restrictions that will apply to the mining area in general. Restricted or loss of access impacts on the ability of descendants and family members, or other persons or communities who by tradition are concerned with graves, to express their living heritage as it may pertain to graves and associated ancestral rites.

Both physical and intangible impacts may result in unplanned events such as the degradation of the intrinsic cultural significance of gravesites, as well as social repercussions. In addition, there are inherent health and safety risks associated with access to operating mine properties by visitors.

12.1.4 Visual Assessment

The theoretical viewshed model for the Project was refined to a practical viewshed model with a buffer of 10 km around the mine infrastructure area and divided into areas that are likely to experience different categories of visual exposure. Due to the nature of the receiving environment it is unlikely that the proposed infrastructure will be visible beyond this 10 km buffer. The practical viewshed model depicts the area from which the Project is likely to be visible. This practical viewshed covers an area of 321.92 km².

The Project has a high visibility and a high visual exposure as it will be visible from a large area and will be dominant in the landscape and clearly noticeable to the viewer. The Project has a medium visual intrusion as it partially fits into the surroundings due to the proximity of the Mokgalakwena Platinum Mine, but will still be clearly noticeable.

The receiving environment and receptors of the Project have a high sensitivity. The receiving environment has a low VAC because there is little screening by the topography and vegetation. According to Oberholzer (2005), the Project can be categorised as having a very high visual impact on the receiving environment. This impact could potentially be reduced to a high visual impact if the recommended mitigation measures are implemented.

The Project will have negative visual impacts on the receiving environment. The waste rock berm and waste rock stockpile will have a permanent and irreversible negative visual impact as the shafts will not be backfilled at this stage. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.

12.2 Item 3(k)(ii): Final Site Map

Please refer to Appendix B (Plan 8) for the final site map at an appropriate scale. This map superimposes all the infrastructural activities proposed in this amendment application against the ecological sensitivity and surrounding communities.

12.3 Item 3(k)(iii): Summary of the Positive and Negative Implications and Risks of the Proposed Activity and Identified Alternatives

Please refer to Section 8.6 for a list of positive and negative implications associated with the proposed amendments at Platreef Mine.

13 Item 3(l): Proposed Impact Management Objectives and the Impact Management Outcomes for Inclusion in the EMPR

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

This EMP Report addresses the environmental impacts during the construction and operational phases of the Project. Due regard must be given to environmental protection during the entire Project. A number of environmental recommendations are therefore made to achieve environmental protection.

13.1 Environmental Objectives and Goals

The environmental objectives for the construction and operational phases are to:

- Protect the biophysical environment from any impacts that cannot be mitigated and that will negatively impact on biodiversity on a regional scale;
- To ensure that activities are carried out so as to aid rehabilitation; and
- To ensure a safe environment for people to live in as is stipulated in the constitution.

13.2 Socio-economic Objectives and Goals

The following socio-economic objectives should be attained during the construction, operation, and decommissioning phases of the Platreef mining operations.

- Adhere to an open and transparent communication procedure with stakeholders at all times.
- Ensure that accurate and regular information is communicated to IAPs.
- Ensure that information is communicated in a manner which is understandable and accessible to IAPs.
- Enhance project benefits and minimise negative impacts through intensive consultation with stakeholders.
- Assemble adequate, accurate, appropriate, and relevant socio-economic information relating to the context of the operation.
- Ensure that recruitment strategies for the mine, prioritise the sourcing of local labour, and share in gender equality.
- Ensure an atmosphere of equality and non-discrimination among the workforce.
- Contribute to the development of functional literacy and numeracy among employees.
- Empower the workforce to develop skills that will equip them to obtain employment in other sectors of the economy.
- Ensure that decommissioning and retrenchments take place in a legally compliant and humane manner.

14 Item 3(m): Final Proposed Alternatives

Platreef Mine has already been authorised at its current location and approvals have been granted for the activities associated with the Project. Therefore no alternatives have been considered further with regards to the location, process and activities of the mine. Amendments have been made to accommodate the proximity of the surrounding communities which has resulted in the change of the mine layout in the effort to optimise the reduced footprint and control the impacts on the surrounding communities. The infrastructure plan will however now include a new stormwater drain and an amended TSF pipeline route (for one section).

15 Item 3(n): Aspects for Inclusion as Conditions of Authorisation

Conditions of authorisation were set out in the EA with reference 12/1/9/2-W32 issued by LEDET. Ivanplats will continue to adhere to the conditions set out in these authorisations. Further to these conditions, it is requested that the following conditions be amended:

- Maintain a 500 m safe blasting distance from the boundaries of the affected communities unless it is shown through a comprehensive safety risk assessment that blasting within 500 m of the community boundary poses minimal risks and can be adequately managed;
- Blasting activities must be undertaken in accordance with the approved blasting permits and with consideration of the Explosives Regulations, 1972 (GN R. 1604 of 1972) and the Mine Health and Safety Act, 1996 and associated Regulations (GN R. 93 of 1997);
- Blasting activities must be undertaken in accordance with the approved blasting permits and with consideration of the Explosives Regulations, 1972 (GN R. 1604 of 1972) and the Mine Health and Safety Act, 1996 and associated Regulations (GN R. 93 of 1997);
- Restrict construction activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays;
- The monitoring programme must adhere to the framework outlined in the Platreef Project CMP, which states the *sites should be inspected quarterly by the applicant and annually by the project archaeologist whose recommendations should be included in the annual review of the CMP;*
- Additionally, it is recommended that CFPs be developed and during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources;
- Surface water monitoring to continue with sampling to be undertaken once a month; and

- Groundwater monitoring to continue with sampling to be undertaken once every quarter; and
- Adherence to the rehabilitation requirements, as set out in the rehabilitation plan in Appendix I.

16 Item 3(o): Description of any Assumptions, Uncertainties and Gaps in Knowledge

It should be noted that this activity of backfilling was not comprehensively addressed as part of the previous EIA process undertaken in 2013. This EIA Addendum Report also does not deal with the proposed backfilling activity as it triggers the requirement for a new WML, hence a new EIA process will need to be conducted. This will be applied for by Ivanplats at a later stage.

The Project amendments and inclusion of activities do not trigger any new listed activities in terms of the new EIA Regulations (2014) at the time of submission of this EIA Addendum Report.

17 Item 3(p): Reasoned Opinion as to whether the Proposed Activity should or should not be authorised

17.1 Item 3(p)(i): Reasons why the Activity should be authorised or not

The findings of the impact assessment have shown that the proposed Project may result in certain negative impacts to the environment; however, adequate mitigations measures have been included into the EMP Report to reduce the significance of all the identified negative impacts. Most negative impacts (minor and moderate) can be reduced through the implementation of mitigation measures. By reducing the mine's footprint area and subsequent infrastructure layout, Ivanplats can ensure the optimum operation of the Project as well as control the impacts to the surrounding communities.

This amendment authorisation should be granted for Ivanplats to continue with the mining operations at Platreef Mine.

17.2 Item 3(p)(ii): Conditions that must be included in the Authorisation

17.2.1 Specific Conditions to be included into the Compilation and Approval of EMPR

In general, the conditions set out in the existing EA for the Platreef Mine and the associated amendments to this authorisation should be adhered to. In addition, further mitigation measures have been suggested in this application specially pertaining to the amendments should also be adhered to throughout the life of the Project.

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

- Maintain a 500 m safe blasting distance from the boundaries of the affected communities unless it is shown through a comprehensive safety risk assessment that blasting within 500 m of the community boundary poses minimal risks and can be adequately managed;
- Blasting activities must be undertaken in accordance with the approved blasting permits and with consideration of the Explosives Regulations, 1972 (GN R. 1604 of 1972) and the Mine Health and Safety Act, 1996 and associated Regulations (GN R. 93 of 1997);
- Restrict construction activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays;
- The monitoring programme must adhere to the framework outlined in the Platreef Project CMP, which states *the sites should be inspected quarterly by the applicant and annually by the project archaeologist whose recommendations should be included in the annual review of the CMP;*
- Additionally, it is recommended that CFPs be developed and during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources;
- Surface water monitoring to continue with sampling to be undertaken once a month; and
- Groundwater monitoring to continue with sampling to be undertaken once every quarter.

17.2.2 Rehabilitation Requirements

The rehabilitation requirements, as set out in the rehabilitation plan is set out in Appendix I will be adhered to.

18 Item 3(q): Period for which the Environmental Authorisation is required

Based on the LoM and considering various aspects that may delay mining operations, the period for which an amendment authorisation is required is for a period of 30 years.

19 Item 3(r): Undertaking

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

20 Item 3(s): Financial Provision

This financial provision assessment focused on the existing and proposed mining activities and was calculated by means of the Department of Mineral Resources' (DMR) standard method for assessment of mine closure. The cost for rehabilitation and closure of the proposed site according to the DMR Guideline is R 121,291,493 for the full LoM.

20.1 Item 3(s)(i): Explain how the aforesaid amount was derived

The closure cost assessment is done in accordance with the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended[2] and associated regulations.[3] These Regulations provide that the holder of a mining right must make full financial provision for rehabilitation of negative environmental impacts. The methodology used was based on the Department of Mineral Resources (DMR) *"Guideline Document for the Evaluation of the Quantum of Closure- related Financial Provision provided by a Mine"* (DME, 2005), as per the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

The financial provision must guarantee the availability of sufficient funds to undertake the following:

- Rehabilitation of the adverse environmental impacts of the listed or specified activities;
- Rehabilitation of the impacts of the prospecting or mining activities, including the pumping and treatment of polluted or extraneous water;
- Decommissioning and closure of the operations;
- Remediation of latent or residual environmental impacts which become known in the future;
- Removal of building structures and other objects; and
- Remediation of any other negative environmental impacts.

The closure cost assessment has been developed in line with these requirements.

The DMR Guideline format makes use of a set template for which defined rates and multiplication factors are used. The multiplication and weighting factors which ultimately define the rate to be used are determined by amongst others the topography, the classification of the mine according to mineral mined, the risk class of the mine and its proximity to build up or urban areas.

[2] Previously, closure methodology was prescribed in Section 41 (1) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and its Regulations, but these provisions have been repealed. Section 24P in NEMA as amended provides that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts arising from mining activities.

[3] Environmental Impact Assessment Regulations, 2014, GN R982 in Government Gazette 38282 of 4 December 2014.

The updated measurements were included in the financial provision assessment for the FY2015. Measurements that were taken have been standardised to ensure that the costs calculated are easily updatable.

The DMR rates were published in 2005 and, due to inflation, are thus no longer accurate. The 2013 Master Rates used to calculate the previous liability as submitted with the initial EMP dated November 2013 (LP30/5/1/2/2/10067MR) have been updated using an inflationary figure of 6.1% (Average CPI for 2014) and 4.5% (Average CPI for January to November 2015) was then added to the 2014 rates to reflect the current 2015 rates.

The DMR Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine (DME, 2005), classifies a mine according to a number of factors which allows one to determine the appropriate weighting factors to be used during the quantum calculation. The following factors are considered:

- The mineral mined;
- The risk class of the mine;
- Environmental sensitivity of the mining area;
- Type of mining operation; and
- Geographic location.

Once the risk class (Class A, B or C) and the sensitivity of the area where the mine is located (Low, Medium or High) had been determined using the appropriate tables the unit rates for the applicable closure components were identified.

The classification of the project site has been summarised in Table 20-1. It must be noted, however, that of the 18 closure components that exist only 3 are influenced by the risk class and sensitivity, the remaining 15 have a standard multiplication factor, irrespective of the class or sensitivity.

Table 20-1: Mine Classification

Mine	Risk Class	Sensitivity	Terrain	Proximity to Urban Area
Platreef Platinum Mine	B[4]	High	Undulating	Urban

The financial provision for the Life of Mine of Platreef Mine is calculated to be R 121,291,493 based on the DMR method of calculation. The total cost includes contingencies of 10%, Preliminary and General (P&Gs) of 6% and is inclusive of VAT at 14%.

[4] Underground mines have a minimum risk ranking of B (Medium risk)

Table 20-2 presents the detailed forecast of the expected increase in financial provision as Ivanplats continues to progress through the construction phase into the operational phase in Year 2021. Ivanplats annually conducts a reassessment of their financial provision based on actual disturbances and it is recommended that this forecast be updated as the progress against the planned construction schedule can be verified. A detailed breakdown has been provided in Appendix J.

Table 20-2: Financial Provision Forecast for the Project

CALCULATION OF THE QUANTUM							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Mine:	Platreef	**Location:**	Mokopane, Limpopo Province														
Evaluators:	Digby Wells Environmental	**Date:**	12-Jan-16														
No.:	**Description: Class C (Low Risk)**	**Unit:**	**B**	**C**	**D**	**LoM**											
			Master rate	**Multiplication factor**	**Weighting factor 1**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**
			Step 4.3	**Step 4.3**	**Step 4.4**												
1	Dismantling of processing plant & related structures (incl. overland conveyors & Power lines)	m^3	R 12.88	1.00	1.10	R8,547,585	R61,962	R61,962	R61,962	R6,676,799	R6,774,147	R6,774,147	R6,774,147	R6,774,147	R6,774,147	R6,774,147	R6,774,147
2 (A)	Demolition of steel buildings & Structures	m^2	R 179.47	1.00	1.10	R14,613,426	R872,573	R3,021,663	R3,817,450	R4,709,380	R13,873,668	R25,073,918	R25,073,918	R25,073,918	R25,073,918	R25,073,918	R25,073,918
2 (B)	Demolition of reinforced concrete buildings & structures	m^2	R 264.48	1.00	1.10	R11,045,684	R56,440	R99,207	R99,207	R216,161	R4,291,801	R5,147,718	R5,147,718	R5,147,718	R5,147,718	R5,147,718	R5,147,718
3	Rehabilitation of access roads	m^2	R 32.12	1.00	1.10	R8,165,031	R269,355	R269,355	R269,355	R7,523,181	R7,523,181	R8,165,006	R8,165,006	R8,165,006	R8,165,006	R8,165,006	R8,165,006
4 (A)	Demolition & rehabilitation of electrified railway lines	m	R 311.71	1.00	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
4 (B)	Demolition & rehabilitation of non-electrified railway lines	m	R 170.02	1.00	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
5	Demolition of housing &/or administration facilities	m^2	R 358.94	1.00	1.10	R6,808,908	R513,284	R513,284	R513,284	R3,222,633	R6,419,602	R6,808,513	R6,808,513	R6,808,513	R6,808,513	R6,808,513	R6,808,513
6	Opencast rehabilitation including final voids & ramps	ha	R 188,160.01	**1.00**	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
7	Sealing of shafts, adits & inclines*	m^3	R 96.35	1.00	1.10	R64,693	R32,324	R32,324	R64,649	R64,649	R64,649	R64,649	R64,649	R64,649	R64,649	R64,649	R64,649
8 (A)	Rehabilitation of overburden & spoils	ha	R 125,440.01	1.00	1.10	R284,247	R304,297	R454,203	R453,967	R8,215,568	R10,403,994	R10,579,234	R10,579,234	R10,579,234	R10,579,234	R10,579,234	R10,579,234
8 (B)	Rehabilitation of processing waste deposits & evaporation ponds (basic, salt producing waste)	ha	R 156,233.26	1.00	1.10	R22,686,788	R135,334	R647,465	R680,552	R2,571,421	R6,071,693	R9,697,867	R9,697,867	R9,697,867	R9,697,867	R9,697,867	R9,697,867
8 (C)	Rehabilitation of processing waste deposits & evaporation ponds (acidic, metal-rich waste)	ha	R 453,775.44	**0.90**	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
9	Rehabilitation of subsidised areas	ha	R 105,037.11	1.00	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
10	General surface rehabilitation	ha	R 99,369.64	1.00	1.10	R10,668,325	R200,282	R337,561	R418,797	R1,319,167	R8,666,768	R10,774,188	R10,774,188	R10,774,188	R10,774,188	R10,774,188	R10,774,188
11	River diversions	ha	R 99,369.64	1.00	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
12	Fencing	m	R 113.35	1.00	1.10	R4,456,908	R1,046,016	R1,046,016	R1,046,016	R4,456,908	R4,456,908	R4,456,908	R4,456,908	R4,456,908	R4,456,908	R4,456,908	R4,456,908
13	Water management**	ha	R 37,783.13	**0.67**	1.10	R1,336,616	R51,023	R85,995	R106,690	R336,062	R2,207,884	R2,744,755	R2,744,755	R2,744,755	R2,744,755	R2,744,755	R2,744,755
14	2 to 3 years of maintenance & aftercare	ha	R 13,224.10	1.00	1.10	R1,419,739		R44,923	R55,733	R175,555	R1,153,372	R1,433,827	R1,433,827	R1,433,827	R1,433,827	R1,433,827	R1,433,827
						R90,097,949	**R3,542,890**	**R6,613,957**	**R7,587,663**	**R39,487,482**	**R71,907,667**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**
					(Sum of items 1 to 15 Above)												

CALCULATION OF THE QUANTUM							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Mine:	Platreef	**Location:**	Mokopane, Limpopo Province														
Evaluators:	Digby Wells Environmental	**Date:**	12-Jan-16														
No.:	**Description: Class C (Low Risk)**	**Unit:**	**B**	**C**	**D**	**LoM**											
			Master rate	**Multiplication factor**	**Weighting factor 1**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**
Weighting Factor 2 (step 4.4)			1		**Sub Total 1**	**R90,097,949**	**R3,542,890**	**R6,613,957**	**R7,587,663**	**R39,487,482**	**R71,907,667**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**
Preliminary and General					6% of Subtotal 1	R5,405,877	R212,573	R396,837	R455,260	R2,369,249	R4,314,460	R5,503,244	R5,503,244	R5,503,244	R5,503,244	R5,503,244	R5,503,244
Contingency					10% of Subtotal 1	R9,009,795	R354,289	R661,396	R758,766	R3,948,748	R7,190,767	R9,172,073	R9,172,073	R9,172,073	R9,172,073	R9,172,073	R9,172,073
					Sub Total 2	**R104,513,621**	**R4,109,753**	**R7,672,191**	**R8,801,689**	**R45,805,479**	**R83,412,894**	**R106,396,047**	**R106,396,047**	**R106,396,047**	**R106,396,047**	**R106,396,047**	**R106,396,047**
(Subtotal 1 plus sum of management & administrative items, 1 to 6 above)																	
VAT (14%)						R14,631,907	R575,365	R1,074,107	R1,232,236	R6,412,767	R11,677,805	R14,895,447	R14,895,447	R14,895,447	R14,895,447	R14,895,447	R14,895,447
Grand Total (Subtotal 2 plus VAT)						**R119,145,528**	**R4,685,118**	**R8,746,297**	**R10,033,926**	**R52,218,247**	**R95,090,699**	**R121,291,493**	**R121,291,493**	**R121,291,493**	**R121,291,493**	**R121,291,493**	**R121,291,493**

20.2 Item 3(s)(ii): Confirm that this Amount can be provided for from Operating Expenditure

Confirmation is hereby given that the amount is anticipated to be an operating cost and is provided for as such in the mining work programme.

21 Item 3(t): Deviations from the Approved Scoping Report and Plan of Study

21.1 Item 3(t)(i): Deviations from the Methodology used in determining the Significance of Potential Environmental Impacts and Risks

Not applicable, this application relates to a Section 102/ amendment process which did not include a Scoping Phase.

21.2 Item 3(t)(ii): Motivation for the deviation

Not applicable, this application relates to a Section 102/ amendment process which did not include a Scoping Phase

22 Item 3(u): Other Information required by the Competent Authority

22.1 Item 3(u)(i)(1): Impact on the Socio-Economic Conditions of any Directly Affected Person

In general, the socio-economic conditions of directly affected persons will be uplifted through LED projects, livelihood restoration projects, Broad Based Black Economic Empowerment (B-BBEE) procurement and Corporate Social Responsibility (CSR) initiatives such as Enterprise Development (ED), particularly planned relating to the waste management area at the mine.

22.2 Item 3(u)(i)(2): Impact on any National Estate referred to in Section 3(2) of the National Heritage Resources Act.

The Heritage Impact Assessment (please refer to Appendix F) completed as part of the investigations of the potential impacts associated with the amendments discussed in this application. Impacts on heritage resources associated with the Project for all the phases of the project and the associated mitigation measure are discussed in Section 10.

23 Item 3(v): Other matters required in terms of Sections 24(4)(a) and (b) of the Act

Not Applicable.

Part B: Environmental Management Programme Report

1 Item 1(a): Details of the Environmental Assessment Practitioner

Digby Wells Environmental (Digby Wells) is a South African company with international expertise in providing Environmental and Social services to South African as well as international clients, with the focus predominantly on the Mineral Resources and Energy sectors in Africa. Please refer to Table 2 1 below for the contact details of the Environmental Assessment Practitioner (EAP).

Table 1-1-1: Details of the EAP

Name of Practitioner:	Kasantha Moodley
Telephone:	+27 11 789 9495
Fax:	+27 11 789 9498
Email:	kasantha.moodley@digbywells.com

2 Item 1(b): Description of the Aspects of the Activity

Please refer to Part A: Section 10 for the list of aspects.

3 Item 1(c): Composite Map

The composite plan can be found in Appendix B, Plan 8 - Composite Plan.

4 Item 1(d): Description of Impact Management Objectives including Management Statements

4.1 Item 1(d)(i): Determination of Closure Objectives

The Project has the following objectives:

- Re-establishment of the pre-mining land capability to allow for a suitable post mining land use;
- Maintain and minimise impacts to the functioning wetlands and waterbodies within the area;
- Implement progressive rehabilitation measures where possible (i.e. contractors camps and areas used during the construction phase);
- Prevent soil, surface water and groundwater contamination;
- Comply with the relevant local and national regulatory requirements; and
- Maintain and monitor the rehabilitated areas.

4.2 Item 1(d)(ii): The Process for Managing any Environmental Damage, Pollution, Pumping and Treatment of Extraneous Water or Ecological Degradation as a result of undertaking a Listed Activity

The approved EMP Report and associated management options are intended to minimise environmental risk as far as possible. Should, however, circumstances lead to unacceptable risks, emergency systems and procedures have been designed and will be implemented in the case of an emergency to prevent or minimise the consequential environmental damage. The environmental emergency contingency plan addresses any reasonably anticipated failure (most probable risk) for the entire mining area and focuses on incidents that could cause environmental emergencies.

The most crucial aspect of the emergency system is the identification and communication of the emergency to the appropriate persons. Consequently, the names of the appropriate contact person together with their contact numbers would be prominently displayed around the facility. The contact details will be updated on a regular basis. First-party employees (such as security, safety superintendents, mine overseers, environmental officers) will be trained to respond to the responsible personnel in the event of an emergency.

The environmental emergency contingency plan covers the following risks:

- Fall of Ground;
- Explosions;
- Fires;
- Inundation of workings (including gas, water and mud);
- Transport (surface busses);
- Ventilation fan; and
- Labour Unrest.

4.3 Item 1(d)(iii): Potential Risk of Acid Mine Drainage

Ivanplats has identified the process of backfilling as a possible waste rock management strategy for the mined out underground areas. Backfilling of the underground pits with waste rock would reduce the size of rock heaps on the surface as well as sustainably return of waste to its origin. Reactive rock may, however, result in the risk of formation of acid mine drainage (AMD). This would be addressed as part of a separate EIA process.

4.4 Item 1(d)(iv): Steps taken to Investigate, Assess and Evaluate the Impact of Acid Mine Drainage

Ivanplats is currently undertaking an investigation to assess and evaluate the potential impacts of AMD as well as the cost impacts should AMD occur.

4.5 Item i(d)(v): Engineering or Mine Design Solutions to be Implemented to Avoid or Remedy Acid Mine Drainage

Ivanplats is currently undertaking an investigation to assess and evaluate the potential impacts of AMD as well as the cost impacts should AMD occur.

4.6 Item 1(d)(vi): Measures that will be put in place to Remedy any Residual or Cumulative Impact that may result from Acid Mine Drainage

The measures that will be put in place to remedy any cumulative impacts associated with AMD as a result of backfilling the underground pits with waste rock are currently under investigation.

4.7 Item 1(d)(vii): Volumes and Rate of Water Use required for the Mining, Trenching or Bulk Sampling Operation

Phase 1 (4 Mt Plant) of the Project will require between 8 and 10 Mega litres (Ml) of water per day with approximately 16 Ml required for Phase 2 (8 Mt Plant) of the Project per day. Approximately 4 million tonnes of water will be required per annum.

4.8 Item 1(d)(viii): Has a Water Use Licence has been applied for

Ivanplats has submitted a Bulk Sample Shaft WULA to the DWS and is still to submit the WULA for the entire Platreef Project to the DWS, this submission is dependent on receiving the decision on the Bulk Sample WULA.

4.9 Item 1(d)(ix): Impacts to be Mitigated in their Respective Phases

Activity	Phase	Size and scale of disturbance	Mitigation Type	Compliance with standards	Time period for implementation
Air Quality					
Site clearing of infrastructure footprint	Construction	345 ha Limited to the Project site	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing or digging must occur; and ▪ Drop heights when loading and offloading material should be minimised.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013	During Construction
Construction of access / haul roads and stormwater drains / berms	Construction	Mine Road = 20.53 ha Service Road = 1.82 ha Stormwater Drain Servitude = 9.77 ha	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging or scraping must occur; and ▪ The drop heights when loading onto trucks and at tipping points should be minimised.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013	During Construction
Generation of power using diesel generators (10 MW)	Construction	0.96 ha	▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013	During Construction
Crushing	Operational	563 m²	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; and ▪ Enclosure for crushers to contain dust and noise levels.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 SANS 10103:2008 Dust Control Regulations, 2013	During Operations
Hauling: Internal Mine Roads, Haul Roads and Access Roads	Operational	Mine Road = 20.53 ha Service Road = 1.82 ha	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ Set maximum speed limits and have these limits enforced.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013	During Operations
Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	Operational	Waste Rock Stockpile = 27.65 ha CRF Crushed Rock Stockpile = 1.16 ha High Grade Ore Stockpile = 5.56 ha Low Grade Ore Stockpile =	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ Minimise drop heights when loading and offloading material; and ▪ Set maximum speed limits and have these limits enforced.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013	During Operations

Activity	Phase	Size and scale of disturbance	Mitigation Type	Compliance with standards	Time period for implementation
		15.54 ha			
Mining Process: production Shaft and Vent Raises	Operational	Shaft No. 2 = 525 m² Vent Raise 1 = 88 m² Vent Raise 2 = 28 m² Vent Raise 3 = 28 m²	▪ Ensure the concentrations of pollutants underground are within occupational exposure limit.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013	During Operations
Generation of Power using Diesel Generators	Operational	0.96 ha	▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013	During Operations
Demolition of Infrastructure	Decommissioning	345 ha	▪ The dismantling area disturbed must be kept to a minimum; ▪ Drop heights when offloading materials for rehabilitation must be minimised; and ▪ Limit demolition activities to non-windy days. ▪ Rehabilitation in accordance with rehabilitation plan ▪ Dust suppression on exposed surfaces.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013	During Decommissioning
Rehabilitation and Sealing of Shafts	Decommissioning	345 ha	▪ Drop heights should be minimised when offloading materials for rehabilitation; ▪ Limit rehabilitation activities to non-windy days; ▪ Rehabilitation in accordance with rehabilitation plan; and ▪ Dust suppression on exposed surfaces.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013	During Decommissioning
Cultural Heritage					
Site clearance and construction activities	Construction	345 ha Beyond project site	The newly identified burial grounds and graves must be subject to a burial grounds consultation and relocation process. The current consultation and relocation process could be extended to include these graves. The consultation process is regulated by Chapter XI of the NHRA regulations that aim to: ▪ Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves; ▪ Consult with identified stakeholders regarding the effect of the Project on graves; and ▪ Reach agreement with stakeholders on the future of identified graves, to retain sites in situ or exhume, relocate and reinter the contents of the graves. Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that CFPs be developed and included in the EMP as a	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) National Heritage Regulations GN R 548 (2000).	During Construction

Activity	Phase	Size and scale of disturbance	Mitigation Type	Compliance with standards	Time period for implementation
			condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources		
Mine development and processes	Construction, Operational and Decommissioning	345 ha Beyond project site	Where in situ preservation is possible, redesign of development footprints to exclude graves from the development footprint must be considered. A buffer of at least 15m from any linear infrastructure footprints must be maintained. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources. Consultation, as part of the current process being undertaken, will still be required to reach agreement on the in situ conservation, including access requirements. The results of the consultation and any agreements reached must be encapsulated in the CMP currently being compiled.	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) National Heritage Regulations GN R 548 (2000).	Throughout all phases
Noise					
Site clearance and vegetation removal as well as construction of headgear, shaft, haul roads, storm water drain, pipeline and booster pump station	Construction	345 ha Beyond the project site	▪ Restricting construction activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; ▪ Switching off equipment when not in use; and ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence.	National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) The South African National Standards SANS 10103:2008 “The measurement and rating of environmental noise with respect to annoyance and to speech communication” (SANS 10103:2008).	During Construction
Operational activities such as mining process, hauling, stockpiling and power generation	Operation	345 ha Beyond the project site	▪ Locating of diesel generator away from noise sensitive receptors; ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence. ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; and ▪ Switching off equipment when not in use.	National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989)	During Operation

Activity	Phase	Size and scale of disturbance	Mitigation Type	Compliance with standards	Time period for implementation
				The South African National Standards SANS 10103:2008 "The measurement and rating of environmental noise with respect to annoyance and to speech communication" (SANS 10103:2008).	
Demolish and remove site infrastructure	Decommissioning	345 ha Beyond the project site	▪ Restricting decommissioning activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; and ▪ Switching off equipment when not in use.	National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) The South African National Standards SANS 10103:2008 "The measurement and rating of environmental noise with respect to annoyance and to speech communication" (SANS 10103:2008).	During Decommissioning
Visual					
Mine development results in change of land use from agriculture to mining	Construction	345 ha Beyond the project site	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Construction
Site clearance and vegetation removal for TSF pipeline and stormwater drains	Construction	345 ha Beyond the project site	▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Construction

Activity	Phase	Size and scale of disturbance	Mitigation Type	Compliance with standards	Time period for implementation
			subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.		
Mine development requires drilling and blasting for sinking shafts and vent raises	Construction	Shaft No. 2 = 525 m² Vent Raise 1 = 88 m² Vent Raise 2 = 28 m² Vent Raise 3 = 28 m² Beyond the project site	▪ Apply dust suppression techniques to limit the dust dispersion from blasting.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Construction
Mine development requires infrastructure development	Construction	345 ha Beyond the project site	▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Construction
Access / haul roads, TSF pipeline and stormwater drains / berms require infrastructure development)	Construction	Mine Road = 20.53 ha Service Road = 1.82 ha Stormwater Drain Servitude = 9.77 ha	▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Construction
Crushing	Operational	Waste Rock Stockpile = 27.65 ha CRF Crushed Rock Stockpile = 1.16 ha	▪ Apply dust suppression techniques to limit the dust dispersion from crushing.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Operation
Hauling	Operational	Mine Road = 20.53 ha Service Road = 1.82 ha	▪ Roads should be wetted frequently by means of a water bowser to suppress dust	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Operation

Activity	Phase	Size and scale of disturbance	Mitigation Type	Compliance with standards	Time period for implementation
Stockpiling	Operational	Waste Rock Stockpile = 27.65 ha CRF Crushed Rock Stockpile = 1.16 ha High Grade Ore Stockpile = 5.56 ha Low Grade Ore Stockpile = 15.54 ha	▪ Ensure the waste rock berm does not exceed the proposed height of 10 m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Operation
Mining Processes	Operational	345 ha Beyond the project site	▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Operation
Demolition and removal of all infrastructure	Decommissioning	345 ha Beyond the project site	▪ Apply dust suppression techniques to limit the dust from the demolition area; ▪ Limit the quantity of rubble stored on site.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Decommissioning
Rehabilitation of disturbed areas	Decommissioning	345 ha Beyond the project site	▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Decommissioning
Sealing of shafts	Decommissioning	345 ha Beyond the project site	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines	During Decommissioning

5 Item 1(e): Impact Management Outcomes

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Compliance with standards
Site clearing of infrastructure footprint	Dust generation	Air Quality	Construction	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing or digging must occur; and ▪ Drop heights when loading and offloading material should be minimised.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Construction of access / haul roads and stormwater drains / berms	Reduction in air quality	Air Quality	Construction	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging or scraping must occur; and ▪ The drop heights when loading onto trucks and at tipping points should be minimised.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Generation of power using diesel generators (10 MW)	Reduction in air quality due to gaseous emissions	Air Quality	Construction	▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Crushing	Airborne dust leads to reduced air quality	Air Quality	Operational	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; and ▪ Enclosure for crushers to contain dust and noise levels.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Hauling: Internal Mine Roads, Haul Roads and Access Roads	Reduction in the quality of air	Air Quality	Operational	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ Set maximum speed limits and have these limits enforced.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	Reduction in the quality of air	Air Quality	Operational	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ Minimise drop heights when loading and offloading material; and ▪ Set maximum speed limits and have these limits enforced.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Mining Process: production Shaft and Vent Raises	Reduction in the quality of air	Air Quality	Operational	▪ Ensure the concentrations of pollutants underground are within occupational exposure limit.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Compliance with standards
Generation of Power using Diesel Generators	Reduction in air quality due to gaseous emissions	Air Quality	Operational	▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Demolition of Infrastructure	Reduce air quality due to dust emission	Air Quality	Decommissioning	▪ The dismantling area disturbed must be kept to a minimum; ▪ Drop heights when offloading materials for rehabilitation must be minimised; and ▪ Limit demolition activities to non-windy days. ▪ Rehabilitation in accordance with rehabilitation plan ▪ Dust suppression on exposed surfaces.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Rehabilitation and Sealing of Shafts	Reduction in air quality	Air Quality	Decommissioning	▪ Drop heights should be minimised when offloading materials for rehabilitation; ▪ Limit rehabilitation activities to non-windy days; ▪ Rehabilitation in accordance with rehabilitation plan; and ▪ Dust suppression on exposed surfaces.	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Site clearance and construction activities	Physical changes to burial grounds and graves	Cultural Heritage	Construction	The newly identified burial grounds and graves must be subject to a burial grounds consultation and relocation process. The current consultation and relocation process could be extended to include these graves. The consultation process is regulated by Chapter XI of the NHRA regulations that aim to: ▪ Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves; ▪ Consult with identified stakeholders regarding the effect of the Project on graves; and ▪ Reach agreement with stakeholders on the future of identified graves, to retain sites in situ or exhume, relocate and reinter the contents of the graves. Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) National Heritage Regulations GN R 548 (2000).
Mine development and processes	Intangible Impacts to Burial Grounds and Graves	Cultural Heritage	Construction, Operational and Decommissioning	Where in situ preservation is possible, redesign of development footprints to exclude graves from the development footprint must be considered. A buffer of at least 15m from any linear infrastructure footprints must be maintained. It is recommended that CFPs be developed and included in	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) National Heritage Regulations GN R 548 (2000).

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Compliance with standards
				the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources. Consultation, as part of the current process being undertaken, will still be required to reach agreement on the in situ conservation, including access requirements. The results of the consultation and any agreements reached must be encapsulated in the CMP currently being compiled.	
Site clearance and vegetation removal as well as construction of headgear, shaft, haul roads, storm water drain, pipeline and booster pump station	Noise will emanate from the machinery and vehicles operating during the construction activities	Ambient Noise	Construction	▪ Restricting construction activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; ▪ Switching off equipment when not in use; and ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence.	National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) The South African National Standards SANS 10103:2008 “The measurement and rating of environmental noise with respect to annoyance and to speech communication” (SANS 10103:2008).
Operational activities such as mining process, hauling, stockpiling and power generation	Noise from the machinery and vehicles operating crushing circuit, hauling of ore on surface, continuous stockpiling and shaping of waste rock dump and over burden stockpiles as well the use of generators	Ambient Noise	Operation	▪ Locating of diesel generator away from noise sensitive receptors; ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly ▪ Switching off equipment when not in use.	National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) The South African National Standards SANS 10103:2008 “The measurement and rating of environmental noise with respect to annoyance and to speech communication” (SANS 10103:2008).
Demolish and remove site infrastructure	Noise from the machinery and vehicles operating during the decommissioning activities.	Ambient Noise	Decommissioning	▪ Restricting decommissioning activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; and ▪ Switching off equipment when not in use.	National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) The South African National Standards SANS 10103:2008 “The measurement and rating of environmental noise with respect to annoyance and to speech communication”

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Compliance with standards
					(SANS 10103:2008).
Mine development results in change of land use from agriculture to mining	The change of land use from agriculture to mining will have a negative visual impact on the receiving environment	Visual	Construction	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Site clearance and vegetation removal for TSF pipeline and stormwater drains	Infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas.	Visual	Construction	▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Mine development requires drilling and blasting for sinking shafts and vent raises	Drilling and blasting for shafts and vent raises will have a negative visual impact on the receiving environment. Dust from blasting will also have a negative visual impact.	Visual	Construction	▪ Apply dust suppression techniques to limit the dust dispersion from blasting.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Mine development requires infrastructure development	The construction of the headgear and associated shaft infrastructure will have a negative visual impact on the receiving environment.	Visual	Construction	▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Compliance with standards
				surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	
Access / haul roads, TSF pipeline and stormwater drains / berms require infrastructure development)	The construction of surface infrastructure will have a negative visual impact on the receiving environment	Visual	Construction	▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Crushing	Dust from the waste rock crusher and mine crushers will also have a negative visual impact.	Visual	Operational	▪ Apply dust suppression techniques to limit the dust dispersion from crushing.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Hauling	Dust from vehicular activity will also have a negative visual impact	Visual	Operational	▪ Roads should be wetted frequently by means of a water bowser to suppress dust	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Stockpiling	Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact	Visual	Operational	▪ Ensure the waste rock berm does not exceed the proposed height of 10 m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Compliance with standards
Mining Processes	Operation of the production shafts will have a negative visual impact on the receiving environment. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact. These visual impacts will occur for the life of the Project.	Visual	Operational	▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Demolition and removal of all infrastructure	Demolition and removal of infrastructure will have a minor negative visual impact on the receiving environment	Visual	Decommissioning	▪ Apply dust suppression techniques to limit the dust from the demolition area; ▪ Limit the quantity of rubble stored on site.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Rehabilitation of disturbed areas	Rehabilitation of disturbed areas will have a minor negative visual impact on the receiving environment	Visual	Decommissioning	▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Sealing of shafts	Sealing of shafts will have a negative visual impact on the receiving environment. Once the shafts are sealed and rehabilitation is complete, there will be a neutral visual impact on the receiving environment.	Visual	Decommissioning	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines

6 Item 1(f): Impact Management Actions

A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs 4 and 5 will be achieved

Activity	Potential Impact	Aspects Affected	Mitigation Type	Time period for implementation	Compliance with standards
Site clearing of infrastructure footprint	Dust generation	Air Quality	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing or digging must occur; and ▪ Drop heights when loading and offloading material should be minimised.	During Construction	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Construction of access / haul roads and stormwater drains / berms	Reduction in air quality	Air Quality	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging or scraping must occur; and ▪ The drop heights when loading onto trucks and at tipping points should be minimised.	During Construction	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Generation of power using diesel generators (10 MW)	Reduction in air quality due to gaseous emissions	Air Quality	▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.	During Construction	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Crushing	Airborne dust leads to reduced air quality	Air Quality	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; and ▪ Enclosure for crushers to contain dust and noise levels.	During Operations	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Hauling: Internal Mine Roads, Haul Roads and Access Roads	Reduction in the quality of air	Air Quality	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; and ▪ Set maximum speed limits and have these limits enforced.	During Operations	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	Reduction in the quality of air	Air Quality	▪ Application of dust suppressant or watering of the dirt roads and exposed areas; ▪ Minimise drop heights when loading and offloading material; and ▪ Set maximum speed limits and have these limits enforced.	During Operations	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013

Activity	Potential Impact	Aspects Affected	Mitigation Type	Time period for implementation	Compliance with standards
Mining Process: production Shaft and Vent Raises	Reduction in the quality of air	Air Quality	▪ Ensure the concentrations of pollutants underground are within occupational exposure limit.	During Operations	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Generation of Power using Diesel Generators	Reduction in air quality due to gaseous emissions	Air Quality	▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers on generators; ▪ Use of low sulphur diesel in mine equipment and generators; and ▪ Fitting electrostatic precipitators on generators.	During Operations	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Demolition of Infrastructure	Reduce air quality due to dust emission	Air Quality	▪ The dismantling area disturbed must be kept to a minimum; ▪ Drop heights when offloading materials for rehabilitation must be minimised; and ▪ Limit demolition activities to non-windy days. ▪ Rehabilitation in accordance with rehabilitation plan ▪ Dust suppression on exposed surfaces.	During Decommissioning	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Rehabilitation and Sealing of Shafts	Reduction in air quality	Air Quality	▪ Drop heights should be minimised when offloading materials for rehabilitation; ▪ Limit rehabilitation activities to non-windy days; ▪ Rehabilitation in accordance with rehabilitation plan; and ▪ Dust suppression on exposed surfaces.	During Decommissioning	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) NAAQS, 2009 Dust Control Regulations, 2013
Site clearance and construction activities	Physical changes to burial grounds and graves	Cultural Heritage	The newly identified burial grounds and graves must be subject to a burial grounds consultation and relocation process. The current consultation and relocation process could be extended to include these graves. The consultation process is regulated by Chapter XI of the NHRA regulations that aim to: ▪ Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves; ▪ Consult with identified stakeholders regarding the effect of the Project on graves; and ▪ Reach agreement with stakeholders on the future of identified graves, to retain sites in situ or exhume, relocate and reinter the contents of the graves. Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and	During Construction	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) National Heritage Regulations GN R 548 (2000).

Activity	Potential Impact	Aspects Affected	Mitigation Type	Time period for implementation	Compliance with standards
			guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources		
Mine development and processes	Intangible Impacts to Burial Grounds and Graves	Cultural Heritage	Where in situ preservation is possible, redesign of development footprints to exclude graves from the development footprint must be considered. A buffer of at least 15m from any linear infrastructure footprints must be maintained. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources. Consultation, as part of the current process being undertaken, will still be required to reach agreement on the in situ conservation, including access requirements. The results of the consultation and any agreements reached must be encapsulated in the CMP currently being compiled.	Throughout all phases	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) National Heritage Regulations GN R 548 (2000).
Site clearance and vegetation removal as well as construction of headgear, shaft, haul roads, storm water drain, pipeline and booster pump station	Noise will emanate from the machinery and vehicles operating during the construction activities	Ambient Noise	▪ Restricting construction activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; ▪ Switching off equipment when not in use; and ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence.	During Construction	National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) The South African National Standards SANS 10103:2008 “The measurement and rating of environmental noise with respect to annoyance and to speech communication” (SANS 10103:2008).
Operational activities such as mining process, hauling, stockpiling and power generation	Noise from the machinery and vehicles operating crushing circuit, hauling of ore on surface, continuous stockpiling and shaping of waste rock dump and over burden stockpiles as well the use of generators	Ambient Noise	▪ Locating of diesel generator away from noise sensitive receptors; ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence; ▪ Mining related machinery and vehicles must be included in a planned maintenance schedule and services carried out accordingly; and ▪ Switching off equipment when not in use.	During Operation	National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) The South African National Standards SANS 10103:2008 “The measurement and rating of environmental noise with respect to annoyance and to speech communication” (SANS 10103:2008).
Demolish and remove site infrastructure	Noise from the machinery and vehicles operating during the decommissioning activities.	Ambient Noise	▪ Restricting decommissioning activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Reduce the number of vehicles and machinery operating near the perimeter to reduce noise emissions fence; ▪ Mining related machinery and vehicles must be included in a	During Decommissioning	National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989)

Activity	Potential Impact	Aspects Affected	Mitigation Type	Time period for implementation	Compliance with standards
			planned maintenance schedule and services carried out accordingly; and ▪ Switching off equipment when not in use.		The South African National Standards SANS 10103:2008 “The measurement and rating of environmental noise with respect to annoyance and to speech communication” (SANS 10103:2008).
Mine development results in change of land use from agriculture to mining	The change of land use from agriculture to mining will have a negative visual impact on the receiving environment	Visual	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	During Construction	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Site clearance and vegetation removal for TSF pipeline and stormwater drains	Infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas.	Visual	▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.	During Construction	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Mine development requires drilling and blasting for sinking shafts and vent raises	Drilling and blasting for shafts and vent raises will have a negative visual impact on the receiving environment. Dust from blasting will	Visual	▪ Apply dust suppression techniques to limit the dust dispersion from blasting.	During Construction	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines

Activity	Potential Impact	Aspects Affected	Mitigation Type	Time period for implementation	Compliance with standards
	also have a negative visual impact.				
Mine development requires infrastructure development	The construction of the headgear and associated shaft infrastructure will have a negative visual impact on the receiving environment.	Visual	▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	During Construction	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Access / haul roads, TSF pipeline and stormwater drains / berms require infrastructure development)	The construction of surface infrastructure will have a negative visual impact on the receiving environment	Visual	▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised, where possible so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	During Construction	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Crushing	Dust from the waste rock crusher and mine crushers will also have a negative visual impact.	Visual	▪ Apply dust suppression techniques to limit the dust dispersion from crushing.	During Operation	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Hauling	Dust from vehicular activity will also have a negative visual impact	Visual	▪ Roads should be wetted frequently by means of a water bowser to suppress dust	During Operation	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Stockpiling	Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact	Visual	▪ Ensure the waste rock berm does not exceed the proposed height of 10 m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum	During Operation	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines

Activity	Potential Impact	Aspects Affected	Mitigation Type	Time period for implementation	Compliance with standards
			apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.		
Mining Processes	Operation of the production shafts will have a negative visual impact on the receiving environment. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact. These visual impacts will occur for the life of the Project.	Visual	▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night.	During Operation	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Demolition and removal of all infrastructure	Demolition and removal of infrastructure will have a minor negative visual impact on the receiving environment	Visual	▪ Apply dust suppression techniques to limit the dust from the demolition area; ▪ Limit the quantity of rubble stored on site.	During Decommissioning	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines
Rehabilitation of disturbed areas	Rehabilitation of disturbed areas will have a minor negative visual impact on the receiving environment	Visual	▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	During Decommissioning	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines

Activity	Potential Impact	Aspects Affected	Mitigation Type	Time period for implementation	Compliance with standards
Sealing of shafts	Sealing of shafts will have a negative visual impact on the receiving environment. Once the shafts are sealed and rehabilitation is complete, there will be a neutral visual impact on the receiving environment.	Visual	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	During Decommissioning	IFC Performance Standard 3 IFC Environmental, Health and Safety Guidelines

7 Financial Provision

The closure cost assessment is done in accordance with the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended[5] and associated regulations.[6] These Regulations provide that the holder of a mining right must make full financial provision for rehabilitation of negative environmental impacts. The methodology used was based on the Department of Mineral Resources (DMR) *"Guideline Document for the Evaluation of the Quantum of Closure- related Financial Provision provided by a Mine"* (DME, 2005), as per the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

The financial provision must guarantee the availability of sufficient funds to undertake the following:

- Rehabilitation of the adverse environmental impacts of the listed or specified activities;
- Rehabilitation of the impacts of the prospecting or mining activities, including the pumping and treatment of polluted or extraneous water;
- Decommissioning and closure of the operations;
- Remediation of latent or residual environmental impacts which become known in the future;
- Removal of building structures and other objects; and
- Remediation of any other negative environmental impacts.

The closure cost assessment has been developed in line with these requirements.

The regulations for the determination of financial provision for mine rehabilitation and closure were promulgated on 20 November 2015 (GN R1147) under the NEMA, as amended. This report and associated review of the financial provision did not, however, address any of the requirements of these regulations. This report is based on the Regulations applicable as at 1 December 2014[7].

[5] Previously, closure methodology was prescribed in Section 41 (1) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and its Regulations, but these provisions have been repealed. Section 24P in NEMA as amended provides that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts arising from mining activities.

[6] Environmental Impact Assessment Regulations, 2014, GN R982 in Government Gazette 38282 of 4 December 2014.

[7] Although none of the requirements of the new Regulations were applied in this Report, they will need to be addressed in all subsequent reports.

However, in accordance with the Financial Provisioning Regulations, 2015, the holder within 15 months after the coming into effect of the Regulations and annually thereafter, must ensure a review, assessment and adjustment of the approved financial provision in accordance with the Financial Provisioning Regulations, 2015. An audit of the Environmental Authorisation and update of the approved EMP may also be required.

7.1 Item (i)(1): Determination of the Amount of Financial Provision

7.1.1 Item (i)(1)(a): Describe the Closure Objectives and the Extent to which they have been Aligned to the Baseline Environment described under Regulation 22 (2) (d) as described in 2.4 herein

The objective of the rehabilitation plan is to ensure activities associated with the infrastructure located within the mining footprint area will be designed to prevent, minimise or mitigate adverse long-term environmental and social impacts and create a self-sustaining ecosystem. The original rehabilitation plan identified the following objectives:

- Re-establishment of the pre-mining land capability to allow for a suitable post mining land use;
- Maintain and minimise impacts to the functioning wetlands and waterbodies within the area;
- Implement progressive rehabilitation measures where possible (i.e. contractors camps and areas used during the construction phase)
- Prevent soil, surface water and groundwater contamination;
- Comply with the relevant local and national regulatory requirements; and
- Maintain and monitor the rehabilitated areas.

The above mentioned rehabilitation and closure objectives set out in the original rehabilitation plan are still applicable notwithstanding the changes proposed to the mine infrastructure and layout.

7.1.2 Item (i)(1)(b): Confirm specifically that the Environmental Objectives in Relation to Closure have been Consulted with Landowner and Interested and Affected Parties

All the closure objectives based on the post mining land use will be consulted with I&APs during the PPP as part of the amendment process. These objectives were also previously shared with I&APs during the PPP of the EIA undertaken in 2013.

7.1.3 Item (i)(1)(c): Provide a Rehabilitation Plan that describes and shows the Scale and Aerial Extent of the Main Mining Activities, including the Anticipated Mining Area at the time of Closure

Based on the proposed mine layout plan approximately 345 ha of the total surface area is expected to be disturbed by the mining activities. A rehabilitation plan was set out and approved in the application for the Platreef Mine submitted in 2013. This plan is still applicable notwithstanding the changes proposed to the mine infrastructure and layout. The rehabilitation specially pertaining to the amendments in this report is attached as Appendix I.

7.1.4 Item (i)(1)(d): Explain why it can be confirmed that the Rehabilitation Plan is compatible with the Closure Objectives

The closure objectives are regarded as guidelines for what the rehabilitation plan should entail. The approved rehabilitation plan, which remains applicable to the proposed amendments discussed in this application, details how rehabilitation will need to be undertaken and will include management of soil resources and placement of soil once mining is completed.

In addition to this the rehabilitation plan also contains information associated with re-shaping of the landforms (topography plan), operational and post-closure water management, replacement of soils, re-vegetation of the landscape; and monitoring and maintenance. The successful rehabilitation of the site will ensure the rehabilitated area is free draining, erosion free and produce sustainable vegetation as per the closure objectives stated above.

7.1.5 Item (i)(1)(e): Calculate and State the Quantum of the Financial Provision required to Manage and Rehabilitate the Environment in accordance with the applicable Guideline

The financial provision was reassessed to accommodate the changes of the mine layout. The closure liability only focused on the proposed mining activities and the cost for rehabilitation and closure of the proposed site for the LoM according to the DMR Guideline format is R 121,291,493. Please refer to Appendix J for the detailed Closure Cost Report.

7.1.6 Item (i)(1)(f): Confirm that the Financial Provision will be provided as determined

Ivanplats will update its financial provision annually and will contribute to a trust fund or other form of financial guarantee for rehabilitation provision, as required in terms of Section 24P of NEMA, as amended. Contributions to the fund will be made in accordance with the requirements of tax legislation and policy and this will be made up in a manner acceptable to the DMR.

8 Monitoring Compliance with and Performance Assessment

Mechanisms for monitoring compliance with and performance assessment against the EMP Report.

8.1 Item 1(g): Monitoring of Impact Management Actions

A detailed monitoring programme was compiled for Platreef Mine and this programme remains applicable to the proposed changes to the mine layout. This monitoring programme identified aquatics, air quality, noise and surface water as aspects that will be monitored throughout the LOM. Below is a summary of the monitoring method for air quality and noise as these aspects are directly affected by this amendment.

8.1.1 Air Quality Monitoring

The existing dust monitoring networks in the area should be maintained during the Project. As and when necessary, Ivanplats can undertake a regular review and update of these networks. GAA recently undertook a review of the dust monitoring points and amended as follows due to the distribution of the network not allowing for the separation of dust generated on site to that generated within the local communities; and the siting of the points not accounting for the infrastructure built on site and thus source apportionment.

Table 8-1: Monitoring Points

Site	Lat	Long	Requirement
Plat 01	24° 7.118'S	28° 57.802'E	To be decommissioned
Plat 02	24° 7.809'S	28° 57.527'E	To be decommissioned
Plat 03	24° 7.416'S	28° 58.948'E	To be decommissioned
Plat 04	24° 5.531'S	28° 59.611'E	To be decommissioned
Plat 05	24° 4.577'S	28° 58.654'E	To be maintained in current location
Plat 06	24° 5.156'S	28° 56.940'E	To be maintained in current location
Plat 07	24° 5.997'S	28° 58.005'E	To be decommissioned
Plat 08	24° 3.597'S	28° 58.597'E	To be decommissioned
Plat 09	24° 5.005'S	28° 57.540'E	To be moved to the AQ monitoring station at approximately 24° 5.113'S 28° 57.574'E
Plat 10	24° 5.951'S	28° 57.639'E	New optimised site for operational monitoring
Plat 11	24° 5.528'S	28° 57.668'E	New optimised site for operational monitoring

Site	Lat	Long	Requirement
Plat 12	24° 5.109'S	28° 57.934'E	New optimised site for operational monitoring
Plat 13	24° 4.809'S	28° 57.977'E	New optimised site for operational monitoring
Plat 14	24° 5.060'S	28° 57.256'E	New optimised site for operational monitoring
Plat 16	24° 4.538'S	28° 57.193'E	New optimised site for operational monitoring

Ivanplats management should install an additional PM_{10} monitor – to establish ambient levels of this pollutant at a receptor site and operational site. Such data will be useful, if in future the Project comes under scrutiny from regulatory authorities. Monitoring sites should be placed judiciously downwind and preferably at a residential receptor site(s). There must be a programme in place to ensure the monitors are calibrated annually to ensure the integrity of the measured data.

It is recommended that once operation commences, isokinetic sampling of generator stacks be conducted, at least once a year. In addition to the aforementioned, ground level concentrations of gaseous pollutants i.e. SO_2, NO_2, CO, and CO should be monitored. The proposed ambient monitoring must be a continuous process for the life of the Project to assess public exposure at the nearest residential receptor(s).

8.1.2 Noise Monitoring

Noise meter recordings shall be taken quarterly and bi-annually to measure the $L_{Areq,T}$ dBA at various sample points in accordance with the SANS 10103:2008. The results obtained will be measured against the rating limits prescribed in the SANS 10103:2008 guidelines to assess the impact of ambient noise at the mine. Noise measurement should be taken for a period not less than 10 min at each location.

8.2 Item 1(h): Monitoring and Reporting Frequency

8.2.1 Air Quality

Dust samples from the buckets should be collected monthly and analysed and a monthly report should be compiled to monitor fall-out dust from the construction activities and mining operations.

8.2.2 Noise

Once it is established that the mitigation measures have decreased the specific noise levels from the mining activities, the noise monitoring should be carried out on a bi-annual basis thereafter throughout the life of mine.

A report must be compiled quarterly/ bi-annual, depending on the intervals of the monitoring programme then submitted to management to ascertain compliance with the required standards.

8.3 Item 1(i): Responsible Persons

The Environmental Manager (or person in a similar capacity) must act as the responsible person in charge of undertaking the various monitoring programs.

8.4 Item 1(j): Time Period for Implementing Impact Management Actions

The impacts associated with the activities to be undertaken at Platreef Mine were assessed separately for the construction, operational and decommissioning phases of this Project. Therefore, the time period for implementing the proposed mitigation measures may be continual through a specific phase or throughout the LOM.

8.5 Item 1(k): Mechanism for Monitoring Compliance

An annual performance audit (both internal and external) should be conducted by the Mine and an external consultant, respectively.

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (For the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
All project activities	Air quality	Dust deposition rates will be expressed in the units of mg/m^2 day over a 30-day average. Standards South Africa (SANS 1929:2011) has published two important standards in terms of air quality underlying limits for dust fallout rates. Daily PM_{10} monitoring as per current requirements.	It is the role and responsibility of an appointed environmental officer to collect samples	Monthly
	Noise	Noise levels from the proposed mining activities should not measure above the measured baseline level at each mentioned community.	It is the role and responsibility of an appointed environmental officer to collect the noise samples and assess them against the SANS 10103:2008 guidelines	Quarterly/ Bi-annual

9 Item 1(l): Indicate the Frequency of the Submission of the Performance Assessment Report

It is recommended that a performance assessment is submitted to the Regional Manager every two years.

10 Item 1(m): Environmental Awareness Plan

10.1 Item 1(m)(1): Manner in which the Applicant intends to inform his or her Employees of any Environmental Risk which may result from their Work

The purpose of the Environmental Awareness Plan is to outline the methodology that will be used to inform Ivanplats staff of environmental risks that may result from the working environment, and the manner in which these risks will be dealt with to reduce the potential degradation of the environment.

10.1.1 Communication Strategy

The communication of the environmental risks for each phase of the Project will take place at local training centres with personnel from both the administrative and mine worker sectors of the mine.

10.1.2 Management Sector

The communication of the environmental risks to the administrative sector will occur through a one-day workshop. This workshop will seek to explain the following necessary actions:

Firstly each aspect will be described, as well as their significance. Risks associated with each aspect will be discussed to ensure that an understanding of how each action of the project may impact on the environment.

The mitigation of the environmental risk will be elaborated on. It is important that each person understands these management strategies as it ensures that the impact on the environment is kept to a minimum. Data collection regarding each aspect will also be explained to ensure that each aspect is monitored according to those protocols specified by the mine and DME. Along with data collection the reporting of findings will be discussed.

This workshop will take place before the construction phase begins thus ensuring a full understanding of the project and its associated environmental risks before any mining begins. The course will be repeated at the beginning of the operational phase and the material will be integrated in the induction for new personnel.

10.1.3 Mine Workers Sector

The mine workers sector will attend an induction course to ensure that each person is aware of the environmental risks associated with the project. This induction will form part of the health and safety induction.

This induction course will explain and describe the relevant phases of the project as well as those environmental risks that may occur during these phases. The environmental risks of each aspect as well as the mitigation will be elaborated on.

As a method of gaining an understanding of the relevant risks, a play or industrial theatre will be performed to explain lay issues and the employees will be encouraged to rehearse and act out a play of their own. These workshops will be conducted in English as well as one of the local languages and translators will be provided where necessary. The course will take place prior to mining commencing, thus ensuring an understanding of the mine workings and risks.

10.1.4 Evaluation of the Environmental Awareness Plan

The evaluation of the Environmental Awareness Plan will be conducted by either the management or qualified sub-contractors chosen by the mine. This evaluation will entail the auditing of the activities in both the construction and operation phases.

Evaluation is also observed through the raising of environmental issues and the frequency thereof which are highlighted at regular meetings scheduled at the mine.

10.2 Item 1(m)(2): Manner in which Risks will be dealt with in order to avoid Pollution or the Degradation of the Environment

The approved EMP Report and associated management options are intended to minimise environmental risk as far as possible. Should, however, circumstances lead to unacceptable risks, emergency systems and procedures have been designed and will be implemented in the case of an emergency to prevent or minimise the consequential environmental damage. The environmental emergency contingency plan addresses any reasonably anticipated failure (most probable risk) for the entire mining area and focuses on incidents that could cause environmental emergencies.

The most crucial aspect of the emergency system is the identification and communication of the emergency to the appropriate persons. Consequently, the names of the appropriate contact person together with their contact numbers would be prominently displayed around the facility. The contact details will be updated on a regular basis. First-party employees (such as security, safety superintendents, mine overseers, environmental officers) will be trained to respond to the responsible personnel in the event of an emergency.

The environmental emergency contingency plan covers the following risks:

- Fall of Ground;
- Explosions;
- Fires;
- Inundation of workings (including gas, water and mud);
- Transport (surface busses);
- Ventilation fan; and
- Labour Unrest.

11 Item 1(n): Specific Information required by the Competent Authority

The financial provision for the environmental rehabilitation and closure requirements of mining operations is governed by NEMA, as amended, which provides in Section 24P that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts. The rehabilitation plan and financial provision will be reviewed annually.

12 Item 2: Undertaking

The EAP herewith confirms:-

- 2(a) the correctness of the information provided in the reports;
- 2(b) the inclusion of comments and inputs from stakeholders and I&APs ;
- 2(c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- 2(d) the acceptability of the Project in relation to the finding of the assessment and level of mitigation proposed.

Signature of the Environmental Assessment Practitioner:	
Name of Company:	Digby Wells and Associates (South Africa) (Pty) Ltd
Date:	24 March 2016

13 References

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Appendix A: EAP Details

Ms Kasantha Moodley

Senior Environmental Consultant

Environmental and Legal Services

Digby Wells Environmental

1 Education

- Bachelor of Science (BSc) Honours – University of Witwatersrand (2012)
- Bachelor of Science (BSc) – University of KwaZulu Natal (2008)

2 Language Skills

English

3 Employment

August 2014 – Present

Senior Environmental Consultant at Digby Wells Environmental

September 2010 – July 2014

Environmental Consultant/ Senior Environmental Consultant at Environmental Resources Management South Africa (Pty) Ltd

July 2009 - August 2010

Environmental Consultant at ARUP

July 2007 – June 2009

Environmental Consultant at GIBB (Pty) Ltd

4 Experience

A Senior Environmental Consultant with more than 8 years' experience and a strong background in undertaking and delivering local and regional environmental regulatory projects, in the oil and gas, power, mining and manufacturing sectors. Key experience lies in managing environmental impact assessments and delivering a programme of multiple environmental projects and seeing them through the project lifecycle including: feasibility studies, regulatory permitting, stakeholder engagement, interfacing with regulatory agencies and compliance monitoring. Efficiently managed and delivered a programme of project deliverables for a multinational oil company for almost 4 years. Work experience in several African countries including: Angola, Botswana, Mali and Zambia. Key strengths include a robust technical background, international implementation experience, resourcefulness and strong team skills. The development and mentorship of staff is also of keen interest.

5 Project Experience

- Currently undertaking an Environmental and Social Feasibility Study, including an environmental licence amendment process for a new platinum mine for Ivanhoe Mines in South Africa
- Compilation of an ESIA for a new underground gold mine for Randgold Resources in Mali
- Undertook and managed an environmental and social fatal flaw analysis on a confidential project for Ixia Coal (Pty) Ltd in South Africa
- Involved in and compiled the Scoping Report for an integrated environmental regulatory process for a new vanadium mine for Bushveld Minerals in South Africa
- Management of an integrated environmental regulatory process for a new coal mine for Fountain Capital (Pty) Ltd in South Africa
- Management of an integrated regulatory process for the realignment of a provincial road for Glencore Operations South Africa (Pty) Ltd in South Africa
- Management of several Water Use Licence Applications for new mining right areas for Msobo Coal in South Africa
- Updating of Environmental Management Programme Reports for various mining operations in South Africa
- Managed a programme of downstream fuel projects across South Africa for Shell, including project tracking, planning and management of resources and interfacing with the client
- Managed an EIA for a new acetylene gas manufacturing facility for Air Products in South Africa

- Managed and provided environmental advisory services to the Bombela Civils Joint Venture for the planned works on the Gautrain Rapid Rail Transport System and other environmental compliance matters in South Africa
- Managed environmental baseline assessments and developed an EMP for the exploration of coal-bed methane gas for Sasol in Botswana
- Contributed to the revision of a World Bank compliant ESHIA for a new gas fired power station for Chevron in Nigeria
- Undertook a social gap analysis against the IFC Performance Standards of various coal EIA projects for Rio Tinto in Mozambique
- Contributed to the development of a pilot sustainable development management system for Xstrata in South Africa
- Participated as a technical resource in a sustainable development performance improvement project for Vedanta at their operations in Zambia
- Conducted and involved in EIAs and waste permitting for new photovoltaic (PV) solar power plants and a new concentrated solar thermal power plant for independent power producers in South Africa
- Undertook annual EMPR audits for Xstrata, across South Africa
- Undertook a preliminary Equator Principles assessment for a new highway project for Standard Bank in South Africa
- Undertook EIA reviews of road and transport infrastructure projects associated with the 2010 FIFA World Cup held in South Africa
- Coordinated the design team for the event master plan (public health component) for the 2010 FIFA World Cup for Polokwane in South Africa
- Crafted and project-managed the environmental aspects of the transport operational plan for Polokwane City during the 2010 FIFA World Cup in South Africa
- Undertook environmental compliance monitoring for the construction phase of the Gauteng Freeway Improvement Project (GFIP) and other road and transport infrastructure for the 2010 FIFA World Cup in South Africa
- Led the sustainability task force team in implementing and reporting on sustainability driven objectives and targets within the Arup business unit in South Africa
- Contributed to the delivery of the ESIA for the proposed extension to the Morupule Power Station for the Botswana Power Corporation in Botswana
- Delivered the EIA for a new 132kV distribution powerline for Eskom in South Africa
- Delivered the EIA for the route determination of a new metropolitan road for the Johannesburg Roads Agency in South Africa

- Undertook an environmental status quo assessment, including an institutional assessment of the Majhabeng Local Municipality in South Africa
- Undertook environmental compliance monitoring and feasibility studies for extensive government township developments for the Provincial Department of Housing in South Africa
- Secured mining permits for the Ingula Pumped Storage Scheme for the Braamhoek Joint Venture in South Africa

6 Professional Affiliations

Member of the International Association for Impact Assessment South Africa

7 Professional Registration

Applied for Professional Registration with the Environmental Assessment Practitioners Association of South Africa, application pending.

UNIVERSITY OF KWAZULU-NATAL

The Universities of Durban-Westville and Natal merged
to become the University of KwaZulu-Natal on 1 January 2004

This is to certify that

Kasantha Moodley

was admitted this day
at a congregation of the University
to the degree of

Bachelor of Science
(Environmental Science)

having satisfied the conditions prescribed for the degree.

M W Makgoba
Vice-Chancellor

J J Meyerowitz
Acting Registrar

J A Cooke
Dean

17 April 2008

UV PROTECTED

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

At a congregation of the University

held on 19 April 2011

Kasantha Moodley

was admitted to the Degree of

Bachelor of Science with Honours

(Geography)

Dean : Faculty of Science

Vice-Chancellor and Principal

Acting Registrar

01009

Appendix B: List of Plans

Plan 1

Ivanplats (Pty) Ltd

Regional Setting



Legend

- Mining Right Area
- Active Mine
- Proposed Mine
- City
- Secondary Town
- Other Town
- Settlement
- Main Road
- National Road
- Railway Line
- River
- Dam
- Local Municipal Boundary
- Makapan Vally WHS Core Area
- Makapan Valley WHS Buffer
- Protected Area
- Important Bird Area (Birdlife, 2013)

DIGBY WELLS ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator	Ref #: scm.IVA3396.201601.013
Datum: Hartebeesthoek 1994	Revision Number: 1
Central Meridian: 29°E	Date: 07/01/2016

N

0 5 10 20

Kilometres

1:400 000

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Plan 2

Ivanplats (Pty) Ltd

Local Setting

28°55'0"E 29°0'0"E 29°5'0"E

24°0'0"S 24°5'0"S 24°10'0"S

Anglo Platinum Mogalakwena Platinum Mine
Witvinger Nature Reserve
H. L. Crause Private Nature Reserve
Glenesk Private Nature Reserve
Mogalakwena Local Municipality
Lepele-Nkumpi Local Municipality

N11 R518 R101 N1

Ga-Machikiri
Mapela
Sandsloot
Pholotsi Ga-Mabusela
Pholotsi Ga-Masenya
Ga-Mokaba
Magongoa
Baloi
Macheke
Hlonguane
Ga-Mmalepeteke
Ga-Sekgoboko
Ga-Kgobudi
Mzombane
Masodi
Madiba
Mahwelereng B
Masehlaneng
Maroteng
Mahwelereng
Mahwelereng A
Mahwelereng C
Mountain View
Moshate
Michelle
Parkmore
Phola Park
Sekgakgapeng
Sekgakgapeng Ext 1
Mokopane

KLEIN-SANDSLOOT
PHOLOTSI
MOGALAKWENA
DITHOKENG
ROOISLOOT
NGWADITSE
NYLRIVIER
DORPSRIVIER

Legend

- Mining Right Area
- Amended Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Local Municipal Boundary
- Makapan Valley WHS Buffer
- Protected Area

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Projection: Transverse Mercator
Datum: Hartebeesthoek 1994
Central Meridian: 29°E

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Revision Number: 1
Date: 07/01/2016

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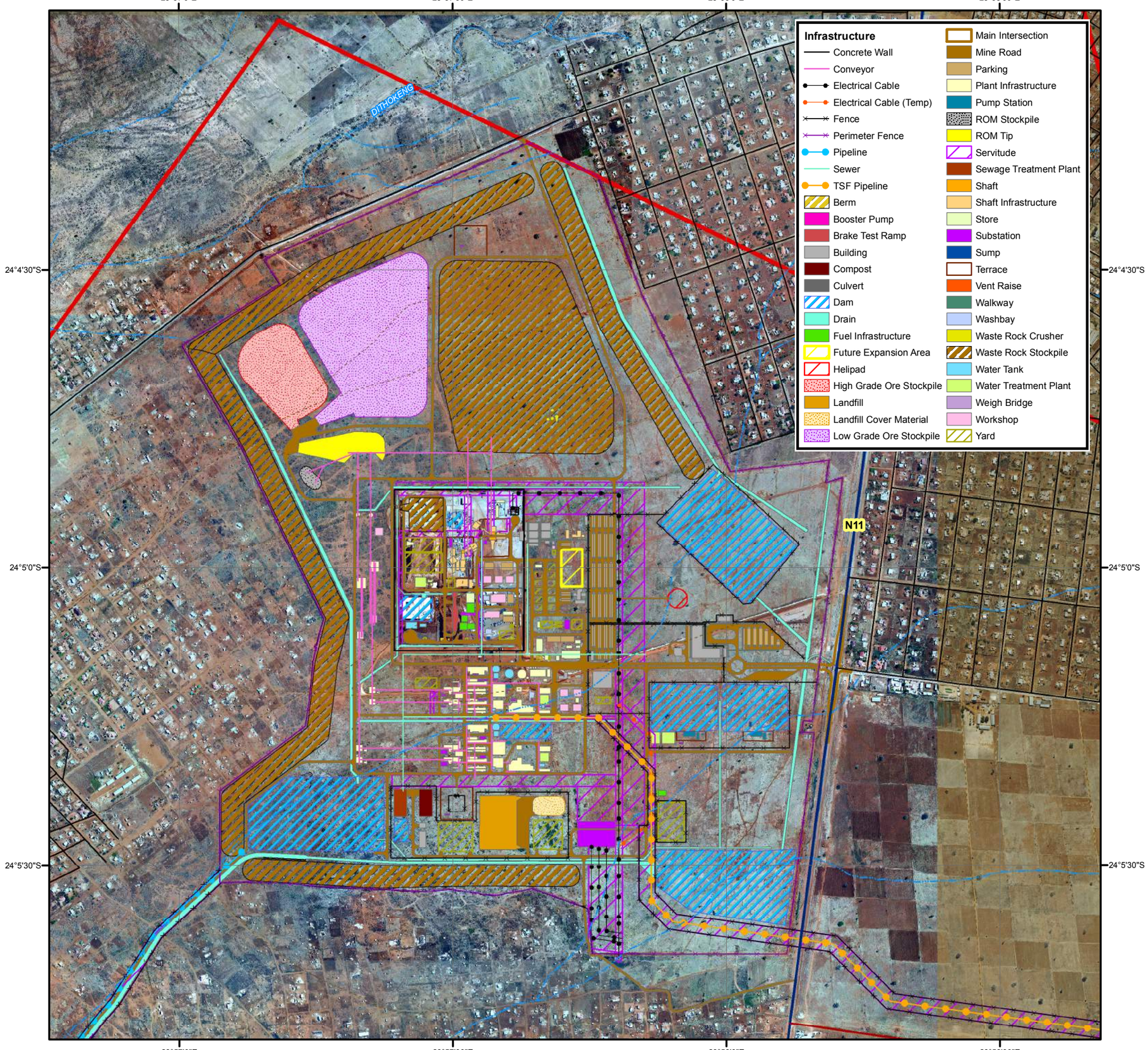
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Plan 3

Ivanplats (Pty) Ltd

Infrastructure Layout



Legend

- Mining Right Area
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream

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Central Meridian: 29°E

Ref #: scm.IVA3396.201601.015
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Date: 07/01/2016

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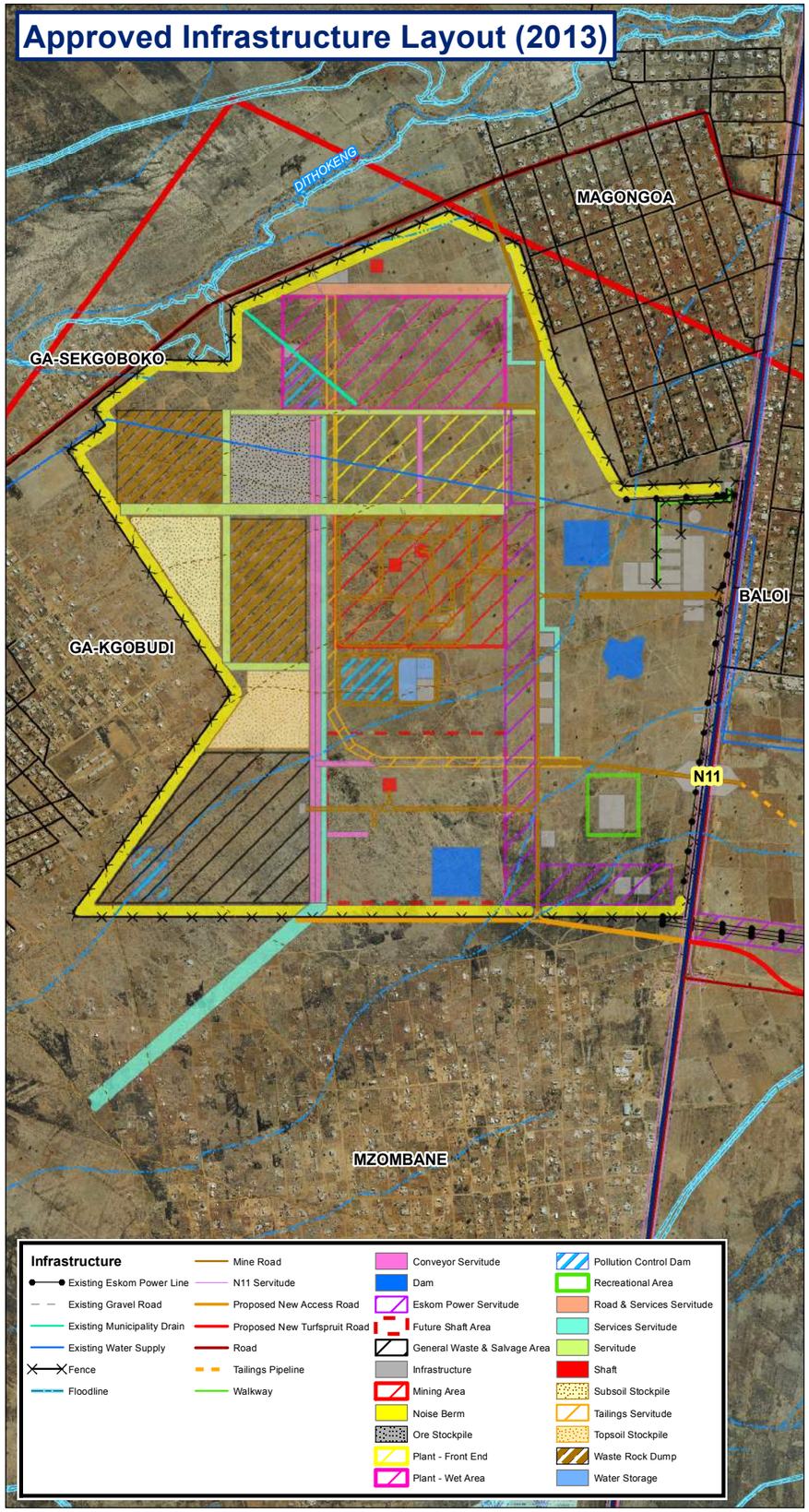
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Plan 4

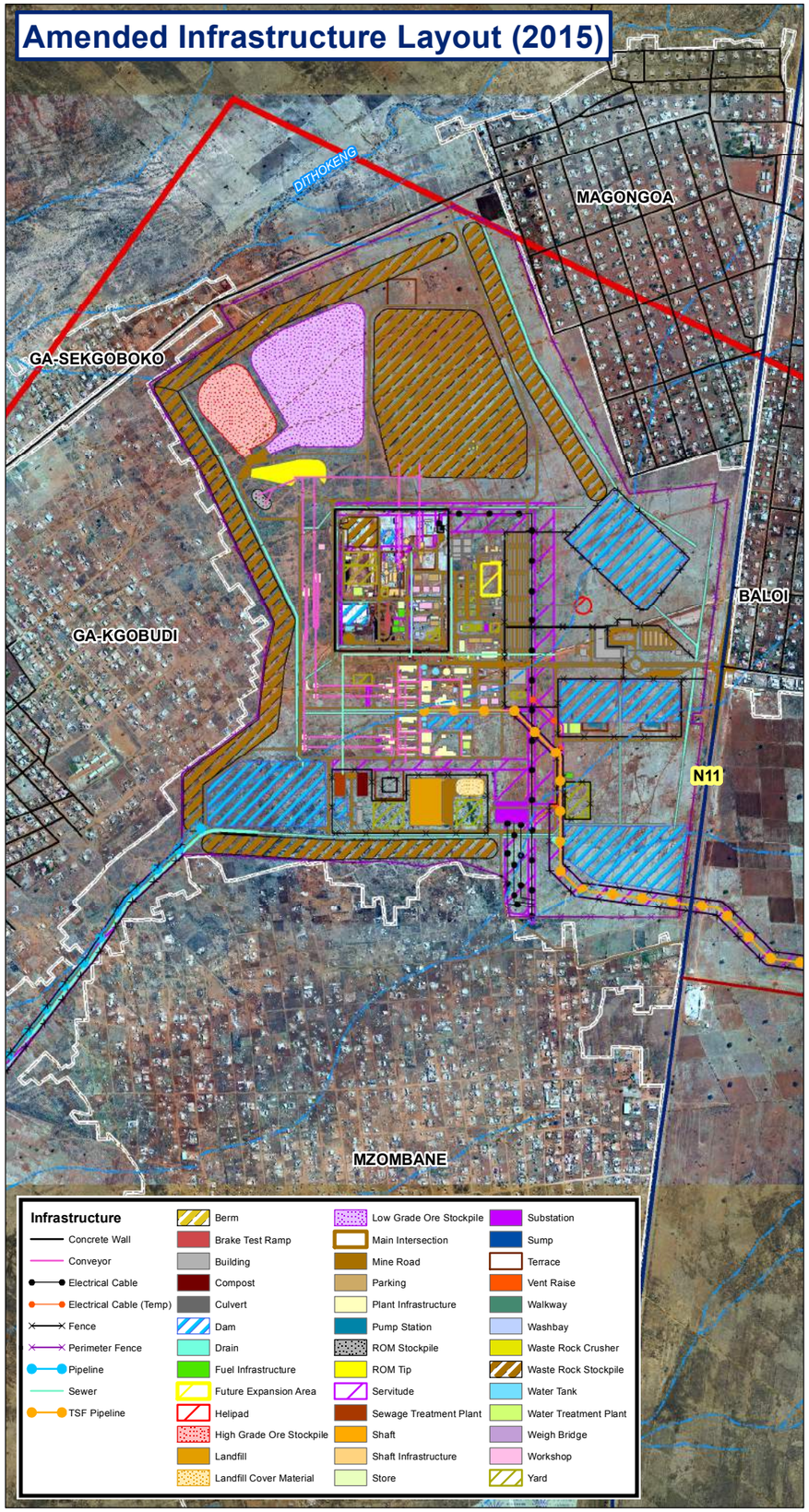
Ivanplats (Pty) Ltd

Comparative Layout

Approved Infrastructure Layout (2013)



Amended Infrastructure Layout (2015)



Legend

- Mining Right Area
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Wetland
- Residential Area

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Projection: Transverse Mercator
Datum: Hartebeesthoek 1994
Central Meridian: 29°E

Ref #: scm.IVA3396.201512.128
Revision Number: 1
Date: 18/12/2015

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Kilometres

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Plan 5

Ivanplats (Pty) Ltd

Cultural Heritage Findings

28°56'0"E 28°57'0"E 28°58'0"E 28°59'0"E 29°0'0"E

24°4'0"S 24°5'0"S 24°6'0"S 24°7'0"S

GA-MOKABA
DITHOKENG
KLEIN-SANDSLOOT
MAGONGOA
BALOI
MACHEKE
GA-SEKGOBOKO
HLONGUANE
GA-KGOBUDI
N11
BGG-002
BGG-001
St-005
BGG-003
BGG-004
BGG-006
MZOMPANE
BGG-007
MASODI
MADIBA
ROOISLOOT
MAHWELEREND

Legend

- Mining Right Area
- Tailings Pipeline (Approved)
- Approved Infrastructure Area
- Amended Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Arterial / National Route
- Main Road
- Dam Wall
- Non-Perennial Stream
- Dam / Lake
- Wetland
- Residential Area

HIA (2013)

- Burial Ground
- Iron Age Smelting Site
- Iron Age Surface Occurrence
- Iron Age/Historical Settlement
- Stone Age Surface Occurrence
- Stone Walling
- Estimated Extent of Archaeological Sites

Heritage Survey (2015)

- Burial Ground
- Iron Age Surface Occurrence
- Survey Tracks

Platreef Grave Register

- Burial Ground

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Projection: Transverse Mercator
Datum: Hartebeesthoek 1994
Central Meridian: 29°E

Ref #: scm.IVA3396.201512.129
Revision Number: 2
Date: 05/01/2016

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Plan 6

Ivanplats (Pty) Ltd

Noise Monitoring Locations

Legend

- Noise Monitoring Locations
- Mining Right Area
- Infrastructure Area
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland

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Projection: Transverse Mercator	Ref #: scm.IVA3396.201512.135
Datum: Hartebeesthoek 1994	Revision Number: 1
Central Meridian: 29°E	Date: 18/12/2015

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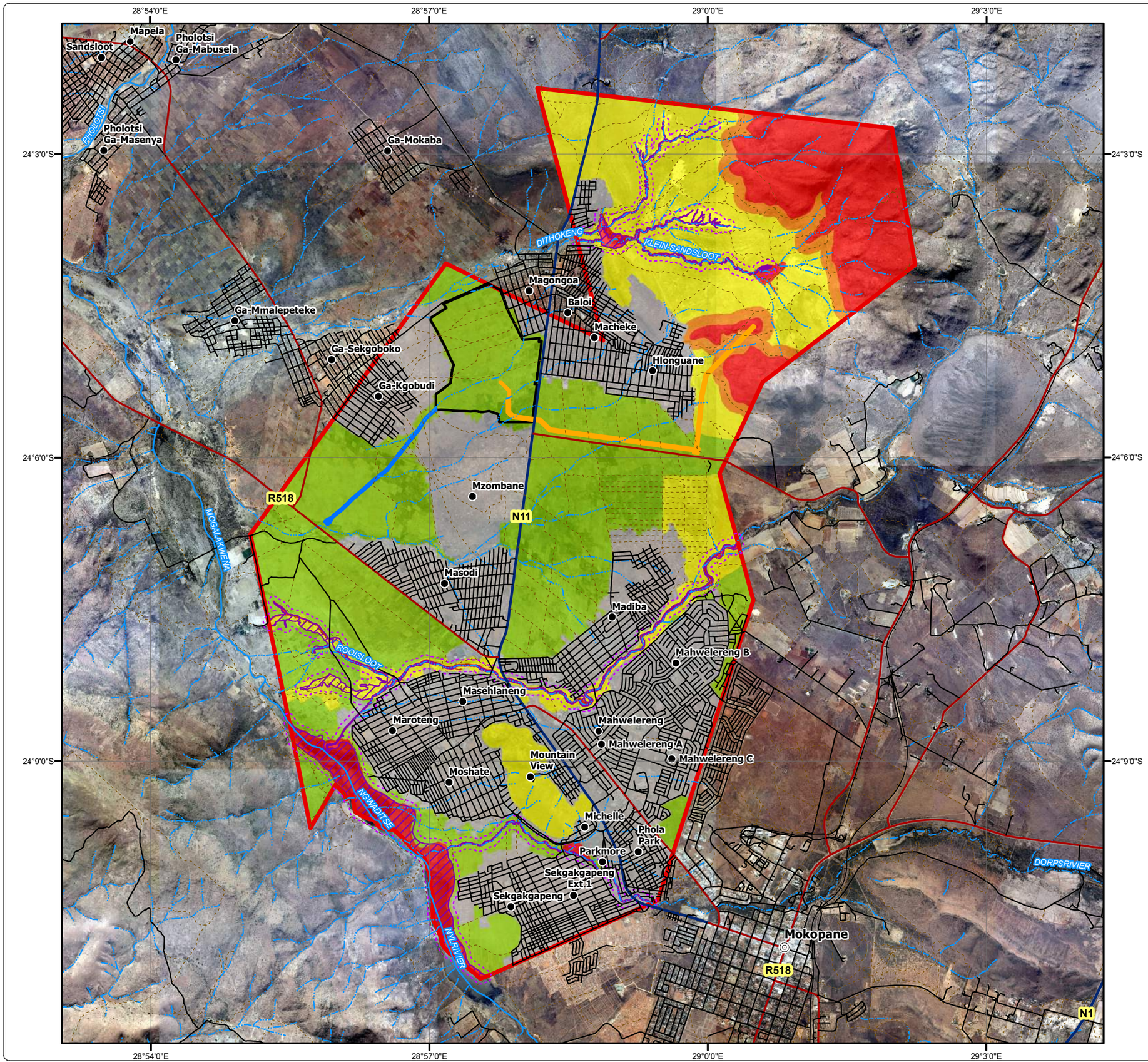
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Plan 7

Ivanplats (Pty) Ltd

Ecological Sensitivity



Legend

- Mining Right Area
- Amended Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream

Ecological Sensitivity

- Low (Residential Area)
- Moderate to Low
- Moderate
- Moderate to High
- High
- Wetland Delineation
- Wetland Buffer (100 m)

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Projection: Transverse Mercator
Datum: Hartebeesthoek 1994
Central Meridian: 29°E

Ref #: scm.IVA3396.201603.116
Revision Number: 1
Date: 22/03/2016

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Kilometres

1:70 000

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Plan 8

Ivanplats (Pty) Ltd

Final Composite Plan

28°56'0"E 28°57'0"E 28°58'0"E 28°59'0"E 29°0'0"E

24°4'0"S 24°5'0"S 24°6'0"S 24°7'0"S

GA-MOKABA
MAGONGOA
BALOI
MACHEKE
GA-SEKGOBOKO
GA-KGOBUDI
HLONGUANE
MZOMBANE
MASODI
MADIBA
MAHWELERENG
DITHOKENG
KLEIN-SANDSLOOT
ROOISLOOT
N11
BGG-001
BGG-002
BGG-003
BGG-004
BGG-006
BGG-007
St-005

Legend

- Mining Right Area
- Amended Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Arterial / National Route
- Main Road
- Non-Perennial Stream
- Perennial Stream
- Residential Area

Heritage Survey (2015)

- Burial Ground
- Iron Age Surface Occurrence
- Survey Tracks

Ecological Sensitivity

- Low (Residential Area)
- Moderate to Low
- Moderate
- Moderate to High
- High
- Wetland Delineation
- Wetland Buffer (100 m)

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Projection: Transverse Mercator
Datum: Hartebeesthoek 1994
Central Meridian: 29°E

Ref #: scm.IVA3396.201603.117
Revision Number: 1
Date: 22/03/2016

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Kilometres

1:30 000

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AppendixC1: Stakeholder Database

DIGBY WELLS ENVIRONMENTAL

Ivanplats (Pty) Ltd

Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province

STAKEHOLDER DATABASE

Company	Mr/Ms	First Name	Last Name
ActionAid South	Mr	Christopher	Rutledge
African National Congress (ANC)	Ms	Tshegofatso	Seoko
African National Congress Youth League	Ms	Maria	Molonyama
Agri SA		The Manager	
Akasia	Ms	Pulana	Rabekane
Amabhungane Centre for Investigative Journalism	Mr	Mashile	Phalane
Bakenberg Community	Mr	Nkube	Motlana
Bakenberg Community	Mr	Michael	Mabusela
Bakone Creche	Ms	Molefe	Mojela
Baloyi Community	Mrs	Maria	Lebese
Baloyi Community	Mr	Sello	Khoza
Baloyi Community	Mrs	Violet	Ngobeni
Baloyi Community	Mr	Frank	Machebele
Baloyi Community	Ms	Enny	Makhafola
Baloyi Community	Ms	Dinah	Mehale
Baloyi Community	Mr	Dan	Makhubela
Baloyi Community	Mr	Samuel	Macheke
Baloyi Community	Mr	Khomotso	Nkune
Baloyi Community	Ms	Promise	Maivieke
Baloyi Community	Ms	Eva	Matjebela
Baloyi Community	Mr	L.S	Mangani
Baloyi Community	Mr	B.T	Nkhuna
Baloyi Community	Ms	Maria	Mabunda
Baloyi Community	Mrs	Marry	Matlhatji
Birdlife SA	Ms	Carolyn	Verdoorn
Cela Afrique/MTN	Mr	Jansen	Rensburg
Circuit Department of Education	Mr	Makinta Jan	Ralegogo
Commission for Religious and Linguistic Rights	Adv	Kgositoi	Sedupane
Community	Mr	Piet	Maluleke
Community Member	Mr	Morgan	Mashai
Community Member	Ms	Johanna	Chuma
Community Member	Ms	Eva	Matjebela

Community Member	Mr	M.B	Hlongwane
Community Member	Ms	Sophia	Mongatawe
Community Member	Mr	H.J	Matjeke
Community Member	Mr	Thomas	Baloyi
Community Member	Mr	George	Ngobeni
Community Member	Ms	Mildred	Ngobeni
Community Member	Mr	Charles	Maluleke
Department of Education	Ms	Mosima Carol	Kadiaka
Department of Agriculture, Forestry and Fisheries (DAFF)	Ms	Lydia	Bosoga
Department of Agriculture, Forestry and Fisheries (DAFF)	Ms	Mashudu	Marubini
Department of Agriculture, Forestry and Fisheries (DAFF)	Ms	Mpume	Ntlokwana
Department of Agriculture, Forestry and Fisheries (DAFF)	Ms	Portia	Khumalo
Department of Agriculture, Forestry and Fisheries (DAFF)	Ms	Queen	Filani
Department of Agriculture, Forestry and Fisheries (DAFF)	Mr	Thapelo	Machate
Department of Agriculture, Forestry and Fisheries (DAFF)	Mr	Vhutshilo	Thavhiwa
Department of Archaeology, Geography, Archaeology and Environmental Studies	Dr	Amanda	Esterhuysen
Department of Environmental Affairs (DEA)	Mr	Lucas	Mahlangu
Department of Environmental Affairs (DEA)	Mr	Mark	Gordon
Department of Environmental Affairs (DEA)	Ms	Millicent	Solomons
Department of Environmental Affairs (DEA)	Ms	Nyiko	Nkosi
Department of Environmental Affairs (DEA)	Mr	Obed	Baloyi
Department of Environmental Affairs (DEA)	Ms	Zingisa	Phohlo
Department of Water and Sanitation (DWS)	Mr	Phuti	Ramolobeng
Department of Water and Sanitation (DWS)	Mr	Louie	Hlekane
Digby Wells Environmental	Ms	Qondile	Monareng
Digby Wells Environmental	Mr	Stephen	Horak
Digby Wells Environmental	Ms	Kasantha	Moodley
Ditsapaning Village Community	Ms	Mmanare	Kekae
E5 Farming	Ms	Jill	Emmerich
Earthlife Africa	Ms	Judith	Taylor
EJ Honiball Prokureur Attorneys	Mr	Emli	Honiball
Endangered Wildlife Trust	Ms	Rynette	Coetzee
Endangered Wildlife Trust (EWT)	Mr	Bradley	Gibbons
Endangered Wildlife Trust (EWT)	Ms	Wendy	Collinson
Endangered Wildlife TrustEWT)	Ms	Anique	Greyling
Eskom	Mr	Malesela	Lelaka
Eskom Transmission Land and Rights	Ms	Tobile	Bokwe
Eskom Transmission Land and Rights	Ms	Tobile	Bokwe
Eskom Transmission Land and Rights	Ms	Esther	Appleyard
Eskom Transmission Land and Rights	Mr	Mfundi	Songo
Ext 17 Mokopane	Mr	Johnny	Mgidi
Ext 20 Mokopane	Ms	Dikeledi	Mokonyane
Ext 20 Mokopane	Mr	Isaac	Nyoni
Extension 19 (ANC)	Mr	Daniel	Molefe
Farm Conterberg	Mr	William	Young
Farm Hendriksrust (conterberg)	Mr	Jan	Young
Farmers Union	Mr	Wena	Goelst
Farmers Union	Mr	Grant	Morris
Ga - Kgobudi Village Community	Ms	Lebo	Molebale
Ga - Kgobudi Village Community	Mr	Lekau	Kekana

Ga - Kgobudi Village Community	Ms	Gatty	Madisha
Ga - Kgobudi Village Community	Mr	David	Manculu
Ga - Kgobudi Village Community	Mr	David	Molehale
Ga - Kgobudi Village Community	Ms	Floria	Matliou
Ga - Kgobudi Village Community	Ms	Jenet	Kekana
Ga - Kgobudi Village Community	Mr	Joseph	Kekura
Ga - Kgobudi Village Community	Mr	Jacob	Kekana
Ga - Kgobudi Village Community	Mr	Jacob	Maatla
Ga - Kgobudi Village Community	Mr	Jacob	Makomedi
Ga - Kgobudi Village Community	Mr	James	Kekana
Ga - Kgobudi Village Community	Ms	Josephine	Lekalakala
Ga - Kgobudi Village Community	Ms	Julia	Kekana
Ga - Kgobudi Village Community	Ms	Julia	Chaba
Ga - Kgobudi Village Community	Mr	Klaas	Mvundlela
Ga - Kgobudi Village Community	Mr	Malesela	Kekana
Ga - Kgobudi Village Community	Ms	Maria	Kekana
Ga - Kgobudi Village Community	Ms	Maria	Langa
Ga - Kgobudi Village Community	Ms	Matlakala	Maronkang
Ga - Kgobudi Village Community	Mr	Patrcik	Lebelo
Ga - Kgobudi Village Community	Mr	Ronny	Mashitelo
Ga - Kgobudi Village Community	Mr	Simon	Molebale
Ga - Kgobudi Village Community	Mr	Alfred	Puluky
Ga - Kgobudi Village Community	Mr	Alfred	Thule
Ga - Kgobudi Village Community	Mr	Ananias	Lebelo
Ga - Kgobudi Village Community	Mr	Andrew	Tema
Ga - Kgobudi Village Community	Ms	Betty	Tema
Ga - Magongoa Village Community	Ms	Gladys	Sebetha
Ga - Magongoa Village Community	Mr	Andries	Sedwana
Ga - Magongoa Village Community	Mr	David	Mkoatsi
Ga - Magongoa Village Community	Ms	Dermima	Kgonyane
Ga - Magongoa Village Community	Ms	Diarah	Sebetha
Ga - Magongoa Village Community	Ms	Emily	Majopeto
Ga - Magongoa Village Community	Ms	Emily	Somo
Ga - Magongoa Village Community	Mr	Frans	Bapela
Ga - Magongoa Village Community	Ms	Fridah	Ramoroka
Ga - Magongoa Village Community	Ms	Joyce	Setena
Ga - Magongoa Village Community	Ms	Linah	Laka
Ga - Magongoa Village Community	Ms	Christina	Morulane
Ga - Magongoa Village Community	Ms	Agnes	Matjiu
Ga - Magongoa Village Community	Mr	Amos	Thobane
Ga - Magongoa Village Community	Ms	Cathrine	Sebopa
Ga - Magongoa Village Community	Mr	Lleka	Kekana
Ga - Magongoa Village Community	Ms	Letha	Mogotlane
Ga - Magongoa Village Community	Ms	Francina	Kgaswa
Ga - Magongoa Village Community	Ms	Francina	Senama
Ga - Magongoa Village Community	Ms	Francina	Thabetha
Ga - Magongoa Village Community	Ms	Gladys	Mmaphelo
Ga - Magongoa Village Community	Ms	Granny	Nkoana
Ga - Magongoa Village Community	Mr	Jack	Magashwa
Ga - Magongoa Village Community	Mr	Jahannes	Tlhotse
Ga - Magongoa Village Community	Ms	Jane	Ramaru

Ga - Magongoa Village Community	Ms	Johanna	Mabotja
Ga - Magongoa Village Community	Ms	Johanna	Baloyi
Ga - Magongoa Village Community	Mr	Johannes	Lentswane
Ga - Magongoa Village Community	Ms	Joyce	Chabalala
Ga - Magongoa Village Community	Ms	Olgar	Moabelo
Ga - Magongoa Village Community	Ms	Ramasela	Matzeke
Ga - Magongoa Village Community	Ms	Ramokone	Laka
Ga - Magongoa Village Community	Ms	Rebecca	Loholo
Ga - Magongoa Village Community	Ms	Resibe	Seoma
Ga - Magongoa Village Community	Ms	Rhina	Letswalo
Ga - Magongoa Village Community	Mr	Simon	Moasa
Ga - Magongoa Village Community	Mr	Simon	Mokgotho
Ga - Magongoa Village Community	Mr	Sophia	Kgonyane
Ga - Magongoa Village Community	Ms	Suzen	Moakamedi
Ga - Magongoa Village Community	Ms	Tebogo	Molebana
Ga - Magongoa Village Community	Mr	Thomas	Mashaba
Ga - Magongoa Village Community	Ms	Grace	Papo
Ga - Magongoa Village Community	Ms	Ivy	Maboatla
Ga - Magongoa Village Community	Mr	James	Betha
Ga - Magongoa Village Community	Mr	Jacob	Mamashela
Ga - Magongoa Village Community	Mr	Aaron	Mashile
Ga - Magongoa Village Community	Mr	Abraham	Ledwaba
Ga - Magongoa Village Community	Mr	Abram	Letwaba
Ga - Magongoa Village Community	Ms	Agnes	Thobane
Ga - Magongoa Village Community	Ms	Agnes	Monama
Ga - Magongoa Village Community	Mr	Alfred	Chauke
Ga - Magongoa Village Community	Ms	Anna	Baloyi
Ga - Magongoa Village Community	Mr	Anost	Seema
Ga - Magongoa Village Community	Ms	Caroline	Mokobodi
Ga - Magongoa Village Community	Ms	Caroline	Molokomme
Ga - Magongoa Village Community	Mr	Charles	Kganyago
Ga - Magongoa Village Community	Ms	Christina	Matjiu
Ga - Magongoa Village Community	Ms	Christina	Mabotja
Ga - Magongoa Village Community	Ms	Christina	Kgomo
Ga - Magongoa Village Community	Ms	Cilia	Masenya
Ga - Magongoa Village Community	Ms	Clisa	Khalo
Ga - Magongoa Village Community	Mr	Daniel	Hlapa
Ga - Magongoa Village Community	Mr	David	Phahle
Ga - Magongoa Village Community	Mr	David	Digashu
Ga - Magongoa Village Community	Mr	David	Kekana
Ga - Magongoa Village Community	Mr	Dimakatso	Shiburi
Ga - Magongoa Village Community	Ms	Dorcus	Malebana
Ga - Magongoa Village Community	Mr	Epraim	Hlako
Ga - Magongoa Village Community	Ms	Etiya	Lenstswane
Ga - Magongoa Village Community	Ms	Flora	Chabalala
Ga - Magongoa Village Community	Ms	Francina	Mabetja
Ga - Magongoa Village Community	Ms	Francina	Ledwaba
Ga - Magongoa Village Community	Ms	Francina	Molomo
Ga - Magongoa Village Community	Mr	Frans	Khalo
Ga - Magongoa Village Community	Mr	Frans	Mphela
Ga - Magongoa Village Community	Mr	Gabriel	Mafafo

Ga - Magongoa Village Community	Mr	Hendrick	Lendwaba
Ga - Magongoa Village Community	Mr	Jacob	Mamashela
Ga - Magongoa Village Community	Mr	Jacob	Mothupi
Ga - Magongoa Village Community	Mr	James	Kekana
Ga - Magongoa Village Community	Mr	James	Mashishi
Ga - Magongoa Village Community	Ms	Jane	Mkwana
Ga - Magongoa Village Community	Ms	Jane	Masenya
Ga - Magongoa Village Community	Ms	Johanna	Mboweni
Ga - Magongoa Village Community	Ms	Johanna	Masenya
Ga - Magongoa Village Community	Mr	Johannes	Morela
Ga - Magongoa Village Community	Mr	Johannes	Sithole
Ga - Magongoa Village Community	Mr	John	Moabelo
Ga - Magongoa Village Community	Mr	John	Mamashela
Ga - Magongoa Village Community	Mr	John	Ledwala
Ga - Magongoa Village Community	Mr	John	Magongoa
Ga - Magongoa Village Community	Ms	Josephina	Lebogo
Ga - Magongoa Village Community	Ms	Josephina	Maakamedi
Ga - Magongoa Village Community	Ms	Josephine	Sebebana
Ga - Magongoa Village Community	Mr	Josia	Masoga
Ga - Magongoa Village Community	Ms	Joyce	Laka
Ga - Magongoa Village Community	Ms	Joyce	Kekana
Ga - Magongoa Village Community	Ms	Julia	Mathetja
Ga - Magongoa Village Community	Mr	Junis	Malete
Ga - Magongoa Village Community	Mr	Klaas	Maakmedi
Ga - Magongoa Village Community	Mr	Lesiba	Mathobala
Ga - Magongoa Village Community	Mr	Lesiba	Mamashela
Ga - Magongoa Village Community	Ms	Lina	Rantji
Ga - Magongoa Village Community	Mr	Lucas	Malekane
Ga - Magongoa Village Community	Mr	Lucas	Mabule
Ga - Magongoa Village Community	Mr	Lucas	Mamashela
Ga - Magongoa Village Community	Mr	Lucky	Mogatla
Ga - Magongoa Village Community	Ms	Lucy	Molonyama
Ga - Magongoa Village Community	Ms	Lucy	Leso
Ga - Magongoa Village Community	Ms	Mamma	Bambo
Ga - Magongoa Village Community	Ms	Mamoraka	Ledwaba
Ga - Magongoa Village Community	Ms	Mapula	Mokgata
Ga - Magongoa Village Community	Mr	Marcus	Tsatsi
Ga - Magongoa Village Community	Ms	Margaret	Mogale
Ga - Magongoa Village Community	Ms	Margeret	Maboshego
Ga - Magongoa Village Community	Ms	Maria	Seoko
Ga - Magongoa Village Community	Ms	Maria	Khalo
Ga - Magongoa Village Community	Ms	Maria	Khumalo
Ga - Magongoa Village Community	Ms	Maria	Phele
Ga - Magongoa Village Community	Ms	Martha	Mabotha
Ga - Magongoa Village Community	Ms	Martha	Makubela
Ga - Magongoa Village Community	Ms	Martha	Ngwepe
Ga - Magongoa Village Community	Ms	Martha	Shiburi
Ga - Magongoa Village Community	Mr	Martin	Mamashela
Ga - Magongoa Village Community	Ms	Mary	Mokobodi
Ga - Magongoa Village Community	Ms	Mave	Mashia
Ga - Magongoa Village Community	Ms	Melita	khalo

Ga - Magongoa Village Community	Ms	Melita	Serite
Ga - Magongoa Village Community	Mr	Micheal	Tsatsi
Ga - Magongoa Village Community	Ms	Mmakoma	Ngdepe
Ga - Magongoa Village Community	Ms	Monica	Kgobe
Ga - Magongoa Village Community	Mr	Moses	Malindisa
Ga - Magongoa Village Community	Ms	Mosima	Mabotha
Ga - Magongoa Village Community	Mr	Ore	Maaka
Ga - Magongoa Village Community	Mr	Petrus	Baloyi
Ga - Magongoa Village Community	Ms	Pheladi	Bosii
Ga - Magongoa Village Community	Mr	Philipos	Matlou
Ga - Magongoa Village Community	Mr	Phillimon	Ramakgoba
Ga - Magongoa Village Community	Ms	Phina	Mathape
Ga - Magongoa Village Community	Mr	Piet	Thole
Ga - Magongoa Village Community	Ms	Paulina	Ngwepe
Ga - Magongoa Village Community	Mr	Samuel	Mmathe
Ga - Magongoa Village Community	Mr	Samuel	Tsatsi
Ga - Magongoa Village Community	Ms	Winnie	Legodi
Ga - Magongoa Village Community	Ms	Jane	Mashilo
Ga - Magongoa Village Community	Mr	Johannes	Seoko
Ga - Magongoa Village Community	Mr	Johannes	Mashejo
Ga - Magongoa Village Community	Mr	Frans	Puka
Ga - Magongoa Village Community	Mr	Simon	Ledwaba
Ga - Magongoa Village Community	Mr	Freddy	Mathobela
Ga -Kgobudi Village Community	Ms	Ivy	Molebale
Ga -Kgobudi Village Community	Ms	Idah	Molebale
Ga -Kgobudi Village Community	Mr	Cyril	Kabe
Ga -Kgobudi Village Community	Ms	Johanna	Moloyi
Ga -Kgobudi Village Community	Ms	Rosina	Lebelo
Ga -Kgobudi Village Community	Ms	Hellen	Makamodi
Ga -Kgobudi Village Community	Ms	Honey	Labelo / Chaba
Ga -Kgobudi Village Community	Ms	Irene	Molebale
Ga -Kgobudi Village Community	Mr	Isaac	Mapokga
Ga -Kgobudi Village Community	Mr	Johannes	Kekana
Ga -Kgobudi Village Community	Ms	Silly	Rabohlale
Ga -Kgobudi Village Community	Mr	Thomas	Mokwetu
Ga -Kgobudi Village Community	Ms	Veronica	Fatana
Ga -Kgobudi Village Community	Ms	Victoria	Mabuela
Ga -Kgobudi Village Community	Ms	Wendi	Tlhoka
Ga -Kgobudi Village Community	Mr	Abram	Monama
Ga -Kgobudi Village Community	Mr	Abram	Tema
Ga -Kgobudi Village Community	Ms	Agnes	Kekana
Ga -Kgobudi Village Community	Ms	Biacky	Masamabo
Ga -Kgobudi Village Community	Ms	Christina	Molala
Ga -Kgobudi Village Community	Mr	David	Kekama
Ga -Kgobudi Village Community	Mr	David	Matadi
Ga -Kgobudi Village Community	Ms	Elina	Leso
Ga -Kgobudi Village Community	Ms	Elizabeth	Kekana
Ga -Kgobudi Village Community	Ms	Elizabeth	Lomola
Ga -Kgobudi Village Community	Ms	Emily	Lebelo
Ga -Kgobudi Village Community	Ms	Emma	Khota
Ga -Kgobudi Village Community	Ms	Evidence	Kekana

Ga -Kgobudi Village Community	Ms	Francinah	Hlotoba
Ga -Kgobudi Village Community	Mr	Frans	Mawamela
Ga -Kgobudi Village Community	Mr	Godfrey	Lamola
Ga -Kgobudi Village Community	Ms	Hellen	Lamola
Ga -Kgobudi Village Community	Mr	Humpfrey	Papo
Ga -Kgobudi Village Community	Ms	Jane	Kekana
Ga -Kgobudi Village Community	Ms	Jane	Ledwaba
Ga -Kgobudi Village Community	Ms	Jeneaver	Matheane
Ga -Kgobudi Village Community	Mr	Joshua	Molala
Ga -Kgobudi Village Community	Mr	Justice	Mapokga
Ga -Kgobudi Village Community	Ms	Kekulu	Rabohlale
Ga -Kgobudi Village Community	Ms	Kekulu	Masanabo
Ga -Kgobudi Village Community	Mr	Lesetja	kgosana
Ga -Kgobudi Village Community	Mr	Lesiba	Kekana
Ga -Kgobudi Village Community	Ms	Lina	Sengatsi
Ga -Kgobudi Village Community	Ms	Linkie	Mokhanda
Ga -Kgobudi Village Community	Ms	Linkie	Kekana
Ga -Kgobudi Village Community	Ms	Lisbeth	Leso
Ga -Kgobudi Village Community	Ms	Lucy	Maake
Ga -Kgobudi Village Community	Ms	Lucy	Madlanato
Ga -Kgobudi Village Community	Ms	Maria	Montja
Ga -Kgobudi Village Community	Ms	Matia	Ramela
Ga -Kgobudi Village Community	Mr	Matsobane	Molala
Ga -Kgobudi Village Community	Ms	Mokgaetsi	Mvudlela
Ga -Kgobudi Village Community	Ms	Nancy	Jake
Ga -Kgobudi Village Community	Mr	Nicolars	Lamola
Ga -Kgobudi Village Community	Ms	Onica	Molebale
Ga -Kgobudi Village Community	Ms	Paulina	Mokwele
Ga -Kgobudi Village Community	Mr	Philamon	Thamaga
Ga -Kgobudi Village Community	Mr	Piet	Lesiba
Ga -Kgobudi Village Community	Ms	Rosina	Koka
Ga -Kgobudi Village Community	Ms	Salome	Mokgame
Ga -Kgobudi Village Community	Ms	Samuel	Chipa
Ga -Kgobudi Village Community	Ms	Jane	Matjia
Ga -Kgobudi Village Community	Ms	Lieya	Poto
Ga -Kgobudi Village Community	Ms	Margeret	Kekana
Ga -Kgobudi Village Community	Ms	Christinah	Hlokota
Ga -Kgobudi Village Community	Ms	Elizabeth	Tjotjo
Ga -Kgobudi Village Community	Ms	Christina	Monama
Ga -Kgobudi Village Community	Ms	Gladys	Mokwelwa
Ga -Kgobudi Village Community	Ms	Rosina	Dolo
Ga -Kgobudi Village Community	Ms	Rosina	Kekana
Ga -Kgobudi Village Community	Ms	Salome	Mabote
Ga -Kgobudi Village Community	Ms	Anna	Kekana
Ga Machikiri Community	Mr	Thomas	Shibanda
Ga Magongoa Village Community	Ms	Johanna	Magotlane
Ga Magongoa Village Community	Mr	Jan	Sebetha
Ga Magongoa Village Community	Ms	Julia	Mabule
Ga Magongoa Village Community	Ms	Juliet	Molekane
Ga-Kgobudi Village Community	Mr	Clement	Thule
Ga-Kgobudi Village Community	Ms	Agnes	Seema

Ga-Kgobudi Village Community	Ms	Johanna	Mabusela
Ga-Kgobudi Village Community	Ms	Johannah	Maaka
Ga-Kgobudi Village Community	Mr	Johannes	Kekana
Ga-Kgobudi Village Community	Ms	Regina	Thule
Ga-Kgobudi Village Community	Mr	Rinso	Mapokga
Ga-Kgobudi Village Community	Ms	Shirley	Kekana
Ga-Kgobudi Village Community	Ms	Sinah	Kekana
Ga-Kgobudi Village Community	Mr	Skiel	Kekana
Ga-Kgobudi Village Community	Mr	Solomon	Marakalala
Ga-Kgobudi Village Community	Mr	Solomon	Kekana
Ga-Kgobudi Village Community	Mr	Standford	Masemene
Ga-Kgobudi Village Community	Mr	Stephen	Kekana
Ga-Kgobudi Village Community	Mr	Stephen	Mapoga
Ga-Kgobudi Village Community	Mr	Stephen	Khuimama
Ga-Kgobudi Village Community	Mr	Tjale	Seipa
Ga-Kgobudi Village Community	Mr	Tsebe	Lesibana
Ga-Kgobudi Village Community	Mr	Tshepo	Kekana
Ga-Kgobudi Village Community	Mr	Tshikwane	Kekana
Ga-Kgobudi Village Community	Mr	Wilfred	Mashita
Ga-Kgobudi Village Community	Mr	William	Aphane
Ga-Kgobudi Village Community	Mr	Zelly	Molebale
Ga-Kgobudi Village Community	Ms	Annah	Leso
Ga-Kgobudi Village Community	Ms	Elisa	Lebelo
Ga-Kgobudi Village Community	Ms	Elizabeth	Teffe
Ga-Kgobudi Village Community	Mr	Jan	Ngoaka
Ga-Kgobudi Village Community	Mr	Jim	Tjale
Ga-Kgobudi Village Community	Mr	Jimmy	Kgopa
Ga-Kgobudi Village Community	Ms	Josephina	Masenga
Ga-Kgobudi Village Community	Mr	Klaas	Manama
Ga-Kgobudi Village Community	Ms	Lina	Papo
Ga-Kgobudi Village Community	Ms	Linky	Mokobodi
Ga-Kgobudi Village Community	Ms	Lizzy	Monama
Ga-Kgobudi Village Community	Ms	Lucia	Monama
Ga-Kgobudi Village Community	Ms	Martha	Molwele
Ga-Kgobudi Village Community	Mr	Malesela	Leso
Ga-Kgobudi Village Community	Ms	Maria	Tema
Ga-Kgobudi Village Community	Ms	Poppy	Mokagane
Ga-Kgobudi Village Community	Ms	Precious	Khwinana
Ga-Kgobudi Village Community	Mr	Samuel	Kekana
Ga-Kgobudi Village Community	Mr	Samuel	Mkhanda
Ga-Kgobudi Village Community	Mr	William	Ndlovu
Ga-Madiba Kopano	Mr	Alfred	Haoli
Ga-Magongoa Zone 1 Community	Mr	Charles	Mogale
Government of Lebowa	Ms	Suzan	Molele
Hlongwane Community	Mr	John	Nqobeni
Hlongwane Community	Mr	Simon	Ngobeni
Hlongwane Community	Mr	Frans	Mashoba
Hlongwane Community	Mr	Vincent	Phalats
Hlongwane Community	Mr	Jan	Kanyane
Hlongwane Community	Ms	Lerato	Nkuna
Hlongwane Community	Mrs	Suzan	Nkuna

Hlongwane Community	Mrs	Daphney	Baloyi
Hlongwane Community	Mr	Shellboi	Shibambo
Hlongwane Community	Mr	Johannes	Chauke
Hlongwane Community	Mrs	Mable	Nkuna
Hlongwane Community	Mrs	Lerato	Matjeke
Hlongwane Community	Mr	Junior	Manganye
Hlongwane Community	Mrs	Granny	Mbebe
Hlongwane Community	Ms	Annikie	Khoza
Hlongwane Community	Mr	Thulane	Matlye
Hlongwane Community	Mr	James	Cusalala
Hlongwane Community	Mr	William	Makhubela
Hlongwane Community	Mr	Jafta	Makhubela
Hlongwane Community	Mr	Frans	Chabalala
Hlongwane Community	Ms	Tshidi	Calfonia
Hlongwane Community	Mr	William	Baloyi
Hlongwane Community	Ms	Elisa	Hlongwane
Hlongwane Community	Mrs	Linah	Ngobeni
Hlongwane Community	Mr	Johannes	Chauke
Hlongwane Community	Mr	Lucas	Phiri
Hlongwane Community	Mrs	Elisa	Khubayi
Hlongwane Community	Mr	Thomas	Baloyi
Hlongwane Community	Ms	Mabel	Lebese
Hlongwane Community	Mr	John	Mosola
Hlongwane Community	Mr	Mphothi	Shibambo
Hlongwane Community	Mr	M.J	Maluleke
Hlongwane Community	Mr	William	Mongwane
Hlongwane Community	Mr	George	
Hlongwane Community	Ms	Emily	
Hlongwane Community	Mr	Thomas	Mehlode
Hlongwane Community	Mrs	Sarah	Maluleke
Home 2000 Mahwelereng	Mr	Mpho	Leopeng
Hospital View	Mr	Johannes	Langa
Hospital View	Mr	Motjoko Johannes	Langa
Hospital View	Mr	Lenga	Motshudi
Housing Development Forum	Ms	Terry	Kekana
Institute for Human Evolution	Mr	Francis	Thackeray
Interested Party	Mr	John	Capel
Interested Party	Ms	C	Kwabisa
Interested Party	Mr	M.J	Chabalala
Interested Party	Mr	M.T	Ngosani
Interested Party	Mr	Percy	Lebese
Interested Party	Mr	Keven	Carlos
Interested Party	Mr	Lucky	Seopa
Interested Party	Ms	Evelyn	Chabalala
Interested Party	Mr	V	Mogatla
Interim Community Representatives / Kopano Formation Committee	Mr	Aubrey	Langa
K.F.C	Mr	Solomon	Tema
Kgaba Secondary School	Mr	Phillimon	Kopa
Kgobudi (2) (Mzombane) Community	Mr	Barry	Langa
Kgobudi (2) (Mzombane) Community	Ms	Millicent	Mowaswi
Kgobudi (2) (Mzombane) Community	Mr	Tokela	Morudu

Kgobudi (2) (Mzombane) Community	Mr	James	Maema
Kgobudi (2) (Mzombane) Community	Mr	James	Maema
Kgobudi (2) (Mzombane) Community	Mr	Rankeka	Maema
Kgobudi (2) (Mzombane) Community	Ms	Jane	Chaba
Kgobudi (2) (Mzombane) Community	Mr	Malesela	Magwai
Kgobudi (2) (Mzombane) Community	Mr	Frans	Thindisa
Kgobudi (2) (Mzombane) Community	Mr	Richard	Langa
Kgobudi (2) (Mzombane) Community	Ms	Sibongile	Duba
Kgobudi (2) (Mzombane) Community	Mr	Silas	Maluleke
Kgobudi (2) (Mzombane) Community	Mr	Thaloki	Morerwa
Kgobudi (2) (Mzombane) Community	Mr	Frans	Chabalala
Kgobudi (2) (Mzombane) Community	Mr	Emmanuel	Makendo
Kgobudi (2) (Mzombane) Community	Mr	James	Ngobeni
Kgobudi (2) (Mzombane) Community	Mr	Jack	Baloyi
Kgobudi (2) (Mzombane) Community	Ms	Rosina	Matlou
Kgobudi (2) (Mzombane) Community	Mr	Ronald	Matsheke
Kgobudi (2) (Mzombane) Community	Mr	Joel	Mabeke
Kgobudi (2) (Mzombane) Community	Mr	Joseph	Mange
Kgobudi (2) (Mzombane) Community	Ms	Josephine	Monama
Kgobudi (2) (Mzombane) Community	Ms	Joyce	Shibambo
Kgobudi (2) (Mzombane) Community	Ms	Julia	Malokomme
Kgobudi (2) (Mzombane) Community	Mr	Lesetja	Mothapo
Kgobudi (2) (Mzombane) Community	Mr	Lesetja	Moremi
Kgobudi (2) (Mzombane) Community	Mr	Lesetja	Rakobela
Kgobudi (2) (Mzombane) Community	Ms	Lindzi	Baloyi
Kgobudi (2) (Mzombane) Community	Mr	Lucas	Matlou
Kgobudi (2) (Mzombane) Community	Ms	Mabana	Mogano
Kgobudi (2) (Mzombane) Community	Ms	Mashele	Massy
Kgobudi (2) (Mzombane) Community	Mr	Matome	Mashita
Kgobudi (2) (Mzombane) Community	Mr	Matsobane	Nyatlo
Kgobudi (2) (Mzombane) Community	Ms	Maureen	Morwasu
Kgobudi (2) (Mzombane) Community	Mr	Michael	Manamela
Kgobudi (2) (Mzombane) Community	Ms	Mma	Sebatjane
Kgobudi (2) (Mzombane) Community	Mrs	Olga	Lebese
Kgobudi (2) (Mzombane) Community	Mr	Peter	Kekana
Kgobudi (2) (Mzombane) Community	Mr	Peter	Laka
Kgobudi (2) (Mzombane) Community	Ms	Rakgadi	Ramela
Kgobudi (2) (Mzombane) Community	Ms	Lina	Molokomme
Kgobudi (2) (Mzombane) Community	Mr	Pheladi	Machaba
Kgobudi (2) (Mzombane) Community	Ms	Jane	Kekana
Kgobudi (2) (Mzombane) Community	Mr	Johannes	Mabunna
Kgobudi (2) (Mzombane) Community	Ms	Cathrien	Mangena
Kgobudi (2) (Mzombane) Community	Mr	Mushi	Phuti
Kgobudi (2) (Mzombane) Community	Mr	Sonboy	Nduna
Kgobudi (2) (Mzombane) Community	Mr	Steven	Mmenu
Kgobudi (2) (Mzombane) Community	Ms	Sylvia	Masenya
Kgobudi (2) (Mzombane) Community	Ms	Tiny	Langa
Kgobudi (2) (Mzombane) Community	Mr	Thabo	Lebese
Kgobudi (2) (Mzombane) Community	Mr	Thomas	Hlongwane
Kgobudi (2) (Mzombane) Community	Ms	Whelmina	Pulela
Kgobudi (2) (Mzombane) Community	Ms	Anna	Pakgotho

Kgobudi (2) (Mzombane) Community	Mr	Daniel	Lefoka
Kgobudi (2) (Mzombane) Community	Ms	Elizabeth	Molokomme
Kgobudi (2) (Mzombane) Community	Ms	Salphy	Kgomo
Kgobudi (2) (Mzombane) Community	Mr	Aaron	Moeng
Kgobudi (2) (Mzombane) Community	Mr	Abram	Senego
Kgobudi (2) (Mzombane) Community	Mr	Abram	Meheso
Kgobudi (2) (Mzombane) Community	Mr	Alfred	Langa
Kgobudi Community	Ms	M	Kubayi
Kgobudi Community	Mrs	Jeanette	Kekana
Kgobudi Community	Mr	Mpho	Mogafe
Kgobudi Community	Ms	Francina	Kekana
Kgobudi Community	Ms	Matlakala	Tseba
Kgobudi Community	Ms	Martha	Kekana
Kgobudi Community	Mr	Frank	Seema
Kgobudi Community	Mrs	Rambo	Mesina
Kgobudi Community	Mrs	Jane	Ledwaba
Kgobudi Community	Ms	Johanna	Kekana
Kgobudi Community	Mrs	Linah	Kekana
Kgobudi Community	Ms	Mable	Phiri
Kgobudi Community	Ms	Margaret	Mohlapudi
Kgobudi Community	Mr	Milton	Mokwele
Kgobudi Community	Ms	Hellen	Lamela
Kgobudi Community	Mr	Alfred	Mokhanda
Kgobudi Community	Mr	Holy	Maponya
Kgobodi Community	Mr	Mpho	Tjale
Kgobudi Development Committee	Mr	Phillimon	Thamaga
Kgobudi Forum - Kgobudi village	Mr	Johannes	Mautla
Kgopedinota Primary School- Kgobudi village	Mr	Peter	Somo
Kopano Formation Committee	Ms	Sylvia	Dikutla
Kopano Formation Committee	Mr	Shimane	Kekana
LDSFN	Mr	Sello	Kekana
Lawyers for Human Rights	Mr	Anjuli	Maistry
Lawyers for Human Rights	Ms	Lisa	Jrgensen
Lawyers for Human Rights	Mr	Osmond	Mngomezulu
Leago Youth Development Organisation	Ms	Tshidi	Maphilelo
Leago Youth Development Organisation	Ms	Julian	Makgakga
Lebowakgomo Community	Mr	Surprise	Lesufi
Lekhureng Community	Mr	Ernest	Meso
Lekwa High School- Kgobudi village	Mr	Johannes	Kekana
Limpopo Department of Agriculture	Ms	Jacqueline	Maisela
Limpopo Department of Agriculture, Forestry and Fisheries (DAFF)	Mr	Tshifhiwa	Mathase
Limpopo Department of Economic Development, Environment and Tourism (LEDET)	Ms	Tinyiko	Malungani
Limpopo Department of Health and Social Development	Ms	D	Mafubela
Limpopo Department of Labour	Ms	Carol	Mthethwa
Limpopo Department of Mineral Resources (DMR)	Mr	Aaron	Kharivhe
Limpopo Department of Mineral Resources (DMR)	Ms	Cate	Mashapu
Limpopo Department of Mineral Resources (DMR)	Ms	Lerato	Maibelo
Limpopo Department of Mineral Resources (DMR)	Ms	Tebogo	Mangaba
Limpopo Department of Mineral Resources (DMR)	Mr	Thanyani	Muronga
Limpopo Department of Mineral Resources (DMR)	Mr	Thivhulawi	Kolani

Limpopo Department of Public Works	Mr	Ngoashenga	Nare
Limpopo Department of Roads & Transport	Mr	Jonathan	Gafane
Limpopo Department of Rural Development and Land Reform	Ms	Lorraine	Mosebedi
Limpopo Department of Rural Development and Land Reform	Mr	SR	Mphasha
Limpopo Department of Rural Development and Land Reform	Mr	Tinyiko	Makamu
Limpopo Department of Water and Sanitation (DWS)	Mr	Love	Hlekane
Limpopo Department of Water and Sanitation (DWS)	Mr	Donald	Mabanda
Limpopo Department of Water and Sanitation (DWS)	Ms	Mpho	Mabuda
Limpopo Department of Water and Sanitation (DWS)	Ms	Malegodi	Mahlatji
Limpopo Department of Water and Sanitation (DWS)	Ms	Marencia	Mashilo
Limpopo Department of Water and Sanitation (DWS)	Mr	Ben	Sengani
Limpopo Development Agency	Mr	Freddy	Chaba
Limpopo Economic Development, Environment and Tourism (LEDET)	Ms	Phumozo	Thivhafuni
Limpopo Economic Development, Environment and Tourism (LEDET)	Ms	Ntswaki	Mailula
Limpopo Economic Development, Environment and Tourism (LEDET)	Ms	M.S	Mahapa
Limpopo Economic Development, Environment and Tourism (LEDET)	Mr	Lethabo	Seabi
Limpopo Economic Development, Environment and Tourism (LEDET)	Ms	Fatima	Nkhwashu
Limpopo Heritage Resources Authority (LIHRA)	Mr	Donald	Lithole
Limpopo Provincial House of Traditional Leaders	Mr	Solomon	Dikgale
Limpopo: Cooperative Governance, Human Settlements and Traditional Affairs	Mr	M.G	Makoko
Limpopo: Cooperative Governance, Human Settlements and Traditional Affairs	Mr	G G	Shongwane
Livestock Committee- Kgobudi village	Mr	M.W	Masimini
Lomzit	Mr	Lesiba	Molomo
MCDC Mahwelereng	Mr	P.K	Madisha
MCDF	Ms	Anna	Brintshitswe
MIACC	Ms	Ephy	Seoko
MIACDF	Mr	L.D.	Maruma
MI.ACDF	Mr	Andries	Maehoshoane
MKMVA Waterberg Region	Mr	Charles	Machochoane
MOHA	Mr	Lucas	Koopa
MWEF	Ms	Martha	Khwinawa
Mahwelereng Community	Mr	Koketso	Mojela
Mahwelereng Community	Ms	Mercy	Thubakgale
Mahwelereng Community	Ms	Mabye	Makwena
Mahwelereng Community	Mr	Archie	Honyane
Mahwelereng Community	Mr	Peter	Moloto
Mahwelereng Community	Mr	Khutjo	Mushi
Mahwelereng Community	Mr	Rankeka	Maema
Masehlaneng Village Community	Mr	Hussein	Kopole
Masodi Community	Mr	Adam	Kekana
Masodi Community	Mr	Johannes	Rauka
Masodi Community	Mrs	Suzan	Lekolokola
Masodi Community	Mr	Mpho	Kekae
Matjeke Community	Mr	R.H	Maluleka
Matjeke Community	Mr	G.E	Baloyi
Matjeke Community	Mrs	Grace	Maluleke
Matjeke Community	Mrs	Cathrine	Hlongwane

Matjeke Community	Mr	Moses	Baloyi
Matjeke Community	Mr	Percy	Motleng
Matjeke Community	Mr	David	Nyalungu
Matjeke Community	Ms	Elisa	Maluleke
Matjeke Community	Mrs	Cynthia	Maluleke
Matjeke Community	Mrs	Mamma	Baloyi
Matjeke Community	Mrs	Linkie	Baloyi
Matjeke Community	Mrs	Meriam	Shibuvi
Matjeke Community	Mrs	Charlotte	Baloyi
Matjeke Community	Mr	Lady	Makhubela
Matjeke Community	Mr	Samuel	Makhubela
Matjeke Community	Ms	Maria	Baloyi
Matjeke Community	Mrs	Maria	Mongoane
Matjeke Community	Ma	Caroline	Nokesi
Matjeke Community	Ms	Josephina	Chauke
Matjeke Community	Mrs	Maria	Makhubela
Matjeke Community	Ms	Johanna	Maluleke
Matjeke Community	Ms	Dolly	Baloyi
Matjeke Community	Mr	Jerry	Baloyi
Matjeke Community	Mr	Jonas	Makhubela
Matjeke Community	Mr	Jim	Mashimbo
Matjeke Community	Mr	Derrick	Mongwe
Matjeke Community	Mr	Ali	Hlongwane
Matjeke Community	Mr	Monyila	Hatlaane
Matjeke Community	Mr	Salmon	Shikwambe
Matjeke Community	Mrs	Josphinah	Maluleke
Matjeke Community	Mr	Stanley	Matjeke
Matjeke Community	Mrs	Joyce	Machebele
Matjeke Community	Ms	Jummaia	Maluleka
Matjeke Community	Mr	Surprise	Makhubela
Matjeke Community	Mr	Bob	Ngobeni
Matjeke Community	Mr	Eddy	Shiburi
Matjeke Community	Mr	Johannes	Mabuuda
Matjeke Community	Mr	Solly	Motibeng
Matjeke Community	Mr	Wilson	Shibambo
Matjeke Community	Ms	Alice	Mathye
Matjeke Community	Ms	Lindiwe	Mosephe
Matjeke Community	Mr	Sunnyboy	Nokeri
Matjeke Community	Mr	James	Baloyi
Matjeke Community	Mr	Patrick	Sithole
Matjeke Community	Mrs	Johanna	Maluleke
Matjeke Community	Ms	Lisbeth	Ngobeni
Matjeke Community	Mr	Solomon	Motleng
Matjeke Community	Mr	Johannes	Maluleke
Matjeke Community	Ms	Francina	Baloyi
Matjeke Community	Ms	Florah	Hlongwane
Matjeke Community	Mr	Peter	Mangange
Matjeke Community	Mrs	Maria	Maluleke
Matjeke Community	Mr	F	Maluleke
Matjeke Community	Ms	Dineo	Matjeke
Matjeke Community	Ms	Sophy	Shiburi

Matjeke Community	Ms	Anna	Shiburi
Matjeke Community	Mr	L P	Hlongwane
Matjeke Community	Ms	Sophy	Mokguetji
Matjeke Community	Mr	Josephy	Hlongwane
Matjeke Community	Mr	Given	Sibanda
Matjeke Community	Ms	Evans	Maluleka
Matjeke Community	Mr	Tswane	Nkuna
Matjeke Community	Mr	Jonas	Masingi
Matjeke Community	Mr	Lesley	Mawela
Matjeke Community	Ms	Jane	Sibanda
Matjeke Community	Mr	Simon	Chauke
Matjeke Community	Mr	Sonnyboy	Macheke
Matjeke Community	Ms	Sophy	Mongalane
Matjeke Community	Mrs	Marry	Mashimbye
Matjeke Community	Mr	John	Ngwaila
Mboyana & Associates Engineers	Mr	Mboyana	Malesela
MCDF	Mr	Walter	Mphelo
MIACC	Mr	Ephy	Seoko
MIACDF	Mr	Andries	Machochoane
Mining Committee	Mr	N T	Baloyi
Mining Committee	Mr	N.J	Chabalala
MKMVA	Mr	Charles	Mothapo
MKMVA	Mr	Daniel	Molala
MLM-LED	Ms	Emelda	Malatji
Mogalakwena Community	Ms	Melusi	Mpfanseri
Mogalakwena Cross Disability Centre	Mr	John	Tuu-Yawanah
Mogalakwena Local Municipality	Ms	Phumelelo	Hokomane
Mogalakwena Local Municipality	Mr	Lesetja Charles	Kganyago
Mogalakwena Local Municipality	Mr	Lesetja Enock	Manamela
Mogalakwena Local Municipality	Mr	M M	Mthombeni
Mogalakwena Local Municipality	Mr	Hlengane Samuel	Mathebula
Mogalakwena Local Municipality	Mr	Abbas	Shaker
Mogalakwena Local Municipality	Mr	N L	Kgobe
Mogalakwena Local Municipality	Mr	Vaaltyn Hendry	Kekana
Mogalakwena Local Municipality	Mr	Vusi	Mtimkulu
Mogalakwena Local Municipality	Mr	Dan	Tsebe
Mogalakwena Local Municipality	Mr	Hendry	Kekana
Mogalakwena Local Municipality	Ms	Lindah	Kekana
Mogalakwena Local Municipality	Ms	Maphuti Rahab	Lebelo
Mogalakwena Local Municipality	Mr		Rudzani
Mogalakwena Local Municipality	Mr	Malesela Phineas	Sebatjane
Mogalakwena Local Municipality	Mr	E	Panyane
Mogalakwena Local Municipality	Mr	Lesiba Jacob	Mashala
Mogalakwena Local Municipality	Mr	Lesetja Gilbert	Legodi
Mogalakwena Local Municipality	Ms	Mokgaetji Francina	Mutshinya
Mogalakwena Local Municipality	Mr	Kenneth	Kgalo
Mogalakwena Local Municipality	Mr	P G	Pila
Mogalakwena Local Municipality	Mr	Kedibone Andrew	Sebele
Mogalakwena Local Municipality	Mr	Ndonngwase Samuel	Montana
Mogalakwena Local Municipality	Mr	D E	Mailula
Mogalakwena Local Municipality	Mr	R M	Mabusela

Mogalakwena Local Municipality	Mr	Kenneth	Kgalo
Mokopane Besigheids Kamer	Mr	Gerrit	van der Veen
Mokopane Chamber of Commerce	Mr	Gerrit	van der Veen
Mokopane Interested & Affected Communities Committee	Mr	David	Maruma
Mokopane Interested & Affected Communities Committee	Mr	Eliphus	Molwatsi
Mokopane Recycling	Mr	Leon	Huyssteen
Mokopane Taxi Association	Mr	Doctor	Kekana
Mokopane Traditional Council	Mrs	Emily	Nkogatse
Mokopane Traditional Council	Chief	Lesiba	Kekana
Mokopane Tribal Authority	Mr	Japhta	Kekana
Mosesane Community	Mr	John	Manqwolone
Mosesane Community	Ms	Evelyn	Khoza
Mosesane Community	Ms	Lina	Khoza
Mosesane Community	Mr	Idah	Ramaboka
Mosesane Community	Mr	Edward	Montana
Mosesane Community	Mr	Innocent	Mabunda
Mosesane Community	Mr	Kenneth	Lebese
Mosesane Community	Mr	Majwala	Malema
Mosesane Community	Mr	S	Machubela
Mosesane Community	Mr	K J	Hlongwane
Mosesane Community	Mr	Daniel	Mathibela
Mosesane Community	Ms	Johanna	Matjeke
Mosesane Community	Mr	Mpho	Chabalala
Mosesane Community	Mr	Vincent	Khumalo
Mosesane Community	Mr	William	Baloyi
Mosesane Community	Mr	Tshepo	Baloyi
Mosesane Community	Mr		Muhlaba
Mosesane Community	Mrs	Agnes	Matlala
Mosesane Community	Mr	S	Sekka
Mosesane Community	Mr	Thabo	Vuma
Mosesane Community	Mrs	Tshidi	Khoza
Mosesane Community	Mrs	Grace	Khoza
Mosesane Community	Mr	Thomas	Macheke
Mosesane Community	Mrs	Maria	Baloyi
Mosesane Community	Mr	Tinyiko	Maluleke
Mosesetjane SANCO	Mr	Sello	Kekana
MUA	Mr	Charles	Mahlade
Municipal Tourism and Environment	Mr	H	Ngoepe
MVA	Mr	John	Baloyi
MVA	Mr	Lucas	Mkmva
Mvela Civil	Mr	V.M	Kekana
MYDO	Mr	Lesetja	Masenya
National Department of Water Affairs	Mr	Tendani	Nditwani
National Water Forum	Mr	Louis	Meintjes
Nkosi	Mr	M.T	Nkosi
Northern Traansvaal Agricultural Union (NTLU)	Ms	Nicolene	
NTK LIMPOPO AGRIC	Mr	Pierra	Jacobs
Nyl Action Group	Mr	Hilary	Knight
Office Angels	Ms	Ribu	Malatji
Office of the Regional Land Claims Commissioner	Mr	T	Maphoto
Pholarpark Community	Ms	Mary	Mokgato

Pholarpark Community	Ms	Virginia	Mokgopha
Pholarpark Community	Ms	Nthabiseng	Koenaite
Pholarpark Community	Mr	Tshepo	Chokoe
Potgietersrus District Slandbou Unie	Ms	Renita	Prinsloo
Potgietersrus Distrikslandbou unie	Ms	Renita	Prinsloo
Premiers Office	Mr	A	Kharivhe
Premiers Office	Mr	T	Mokgobu
Provincial Legislature	Hon	E	Nong
Provincial Legislature	Hon	H	Matime
Provincial Legislature	Hon	Joy	Matshoge
Provincial Legislature	Hon	SE	Maake
Provincial Legislature	Hon	Thandi	Moraka
Public Protector Office	Mr	Stanley	Mingha
Rietvally farm 240 Portion 9	Mr	Leslie	Coetze
Sabaha April Corp.	Mr	Isaac	Nyoni
SANBI	Ms	Karen	Behr
SANCO	Mr	Joseph	Noko
SANCO	Mr	Victor	Mukosi
SANCO	Ms	Leah	Manaka
SANCO	Ms	Idah	Lekalakala
SANCO Limpopo	Mr	M.J	Maphoso
SANCO Waterberg	Mr	M.K	Dabana
Sediba Sabophelo	Ms	Beauty	Magongoa
Sekgakgapeng	Ms	Portia	Kgosana
Sekgoboko Community	Mr	Lucas	Nkuna
Sekgoboko Community	Mr	M K	Kekana
Sekgoboko Community	Mr	Thoi	Mahlafonya
Sekgoboko Community	Mr	M.K	Kekana
Serappies Ga - Matlala	Mr	Mack	Mahlanya
Shami IS Projects	Mr	Abby	Lebese
SOS	Mr	Oupa	Tlhaloo
South African Heritage Resource Agency	Ms	Magriaza	Galimberti
South African Heritage Resources Agency	Mr	Dumisani	Sibaya
South African Heritage Resources Agency	Mr	Phillip	Hine
South African National Road Agency Ltd	Ms	Ria	Barkhuizen
South African National Road Agency Ltd	Ms	Victoria	Bota
South African National Road Agency Ltd	Mr	Khathutshelo	Ramavhoya
TAC	Ms	Agnes	Tuu-Yawanah
Thabo Street	Mr	Thabang	Nkhana
Transnet Freight Rail	Mr	Louis	Makhubele
Trautenb	Mr	Tess	Rautenbach
Tshamahansi Community	Mr	Josias	Lebese
Tshamahansi Community	Mr	Aubrey	Libisi
Tshamahansi Community	Mr	Seromoca	Matjeke
Tshamahansi Community	Mr	Willem	Mbore
Tshamahansi Youth Development Forum	Mr	Tshepo	Baloyi
Tshamahansi Youth Development Forum	Mr	Thomas	Baloyi
Unit C Hospital View	Mr	France	Mola
Vaaltyn social and Economic Development Forum	Mrs	Seruputlane	Mokonyana
Ward Councillor	Mr	Lesetja Charles	Kganyago
Ward Councillor 21	Mr	Kedibone Andrew	Sebele

Ward Councillor- Ward 20	Mr	Samuel Hlengane	Mathebula
Waterberg Development Agency	Mr	Leonard	Sole
Waterberg District Disability Committee	Ms	Fati Edith	Ngobeni
Waterberg District Municipality	Ms	Bernice	Mnisi
Waterberg District Municipality	Mrs	Betty	Molekwa
Waterberg District Municipality	Ms	Lindiwe	Kgomo
Waterberg District Municipality		Nelson	Masupa
Waterberg District Municipality	Mr	Simon	Mabotja
Waterberg District Municipality	Mr	Reuben	Mashego
Waterberg District Municipality	Mr	Stanley	Koenaite
Waterberg District Municipality	Ms	Sara	Lamola
Waterberg District Municipality	Ms	N.R	Mogotlane
Waterberg District Municipality	Mr	Solomon	Mashao
Waterberg District Municipality	Mr	Simon	Molele
Waterberg District Municipality	Mr	Teboho	Ntshangase
Waterberg District Municipality	Mr	Teboho	Ntshangase
WESSA North	Mr	Lemson	Betha
WESSA North	Mr	Rudzani	Nemukula
WESSA North	Ms	Aluwani	Phola
Wildlife and Environmental Society of South AfricaWESSA)	Mr	Luke	Perkins
Youth Council Mogalakwena @ Madiba	Mr	Collin	Hlaku
Zimbabwe	Mr	Alldays	Mukeri

Appendix C2: Background Information Document, Announcement Letter and Comment Form







DIGBY WELLS
ENVIRONMENTAL

Background Information Document

Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province

Environmental Authorisation Number: 12/1/9/2-W32

Mining Right Number: LP30/5/2/2/1/10067MR

Project Number:
IVA3396

Prepared for:
Ivanplats (Pty) Ltd.

March 2016

Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: AJ Reynolds (Chairman) (British)*, GE Trusler (C.E.O), B Beringer, LF Koeslag, J Leaver*, NA Mehlomakulu, DJ Otto
*Non-Executive

PROJECT BACKGROUND

Ivanplats (Pty) Ltd. (Ivanplats) intends to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (known as the Platreef Project). Digby Wells Environmental undertook the Environmental and Social Impact Assessment (ESIA) for the Platreef Project in 2013. Ivanplats has since been granted various licences[1] to commence with activities associated with the Platreef Project. In particular, the following licences have been granted for the Project:

- **Environmental Authorisation (EA)** dated 27 June 2014 with reference 12/1/9/2-W32 issued by the Limpopo Department of Economic Development, Environment and Tourism (LEDET). Subsequent to this, Ivanplats had applied for and was issued with the following EA Amendments:
  - EA Amendment (19 August 2014) relating to minor amendments of the conditions of approval; and
  - EA Amendment (30 July 2015) relating to the change of location of the Tailings Storage Facility (TSF) from the Turfspruit Farm to the Rietfontein Farm.
- **Mining Right (MR)** dated 04 November 2014 with reference LP30/5/2/2/1/10067MR granted by the Department of Mineral Resources (DMR); and
- **Waste Management Licence (WML)** dated 13 March 2015 with reference 12/9/11/L1224/5 issued by the National Department of Environmental Affairs (DEA).

Since the granting of the above-mentioned licences, Ivanplats has commenced with the sinking or development of Shaft 1 (ventilation intake shaft). In addition, certain mine infrastructure has been established to support the sinking of Shaft 1, including the mine's access road, a mine boundary fence and temporary facilities such as workshops and offices.

During the site establishment phase of the Platreef Project, the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities established residential plots in close proximity to the proposed mine infrastructure area. The approved mine infrastructure layout had a total footprint area of 420 hectares (ha), which has now been reduced to 346 ha due to the encroachments. Ivanplats has consequently revised the approved mine layout to ensure an optimum use of the reduced infrastructure footprint.

Any change to the approved mine layout necessitates the requirement for an amendment to the relevant licences, in this case the Environmental Authorisation (12/1/9/2-W32), in terms of Regulation 31 of the Environmental Impact Assessment (EIA) Regulations, 2014 and the Mining Right (LP30/5/2/2/1/10067MR) in terms of Section 102 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

[1] Ivanplats has submitted the Bulk Sample (Shaft 1) Water Use Licence Application to the Department of Water and Sanitation (DWS) and is still to submit the Water Use Licence Application (WULA) for the Platreef Project as a whole to the Department of Water and Sanitation (DWS). Project stakeholders will be informed of the availability of the WULA for review and comment.

This Background Information Document (BID) has been developed to:

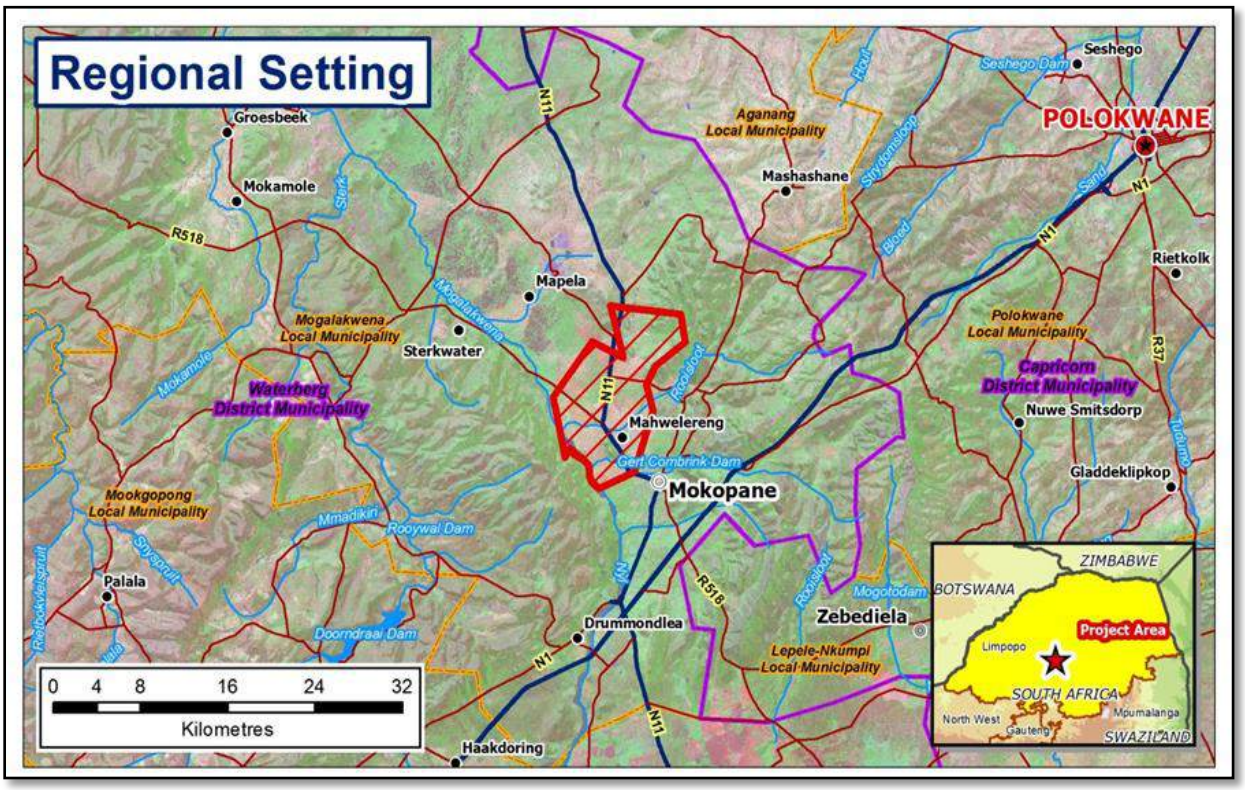
- Provide a description of the Platreef Project
- Provide an overview of the Amendment Application Process set out in terms of the National Environmental Management Act 107 of 1989 (NEMA) and the Environmental Impact Assessment (EIA) Regulations, 2014
- Provide details of the Public Participation Process (PPP) and how stakeholders can become involved.

Digby Wells Environmental has been appointed by Ivanplats and will be responsible for undertaking the EA Amendment Application Process and additional specialist assessments.

PROJECT DESCRIPTION

Project Location

The Platreef Project is located on the farms Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS situated within the Mogalakwena Local Municipality and Waterberg District Municipality in the Limpopo Province. The approved mining area comprises the farms Macalacaskop 243 KR and Turfspruit 241 KR, with a combined extent of 7841.265 ha. The Environmental Authorisation comprises all three farms. The Project is located approximately 280 km northeast of Johannesburg and 8 km northwest of the town of Mokopane and can be accessed via the N11 Highway.



Plan 1: Regional Setting of the Platreef Project

Proposed Project Amendments

The activities and infrastructure that are proposed to be amended are listed below. In particular, the volumes, footprints, positions and/or heights of the infrastructure listed below have been amended to accommodate the reduced footprint of the mine infrastructure layout. These key amendments are as follows:

- Shaft 2 headgear – increased in height to 96 m;
- Shafts – 1 production shaft and 4 ventilation shafts (positions of ventilation shafts have changed);
- Crushers – inclusion of an aboveground waste rock crusher within the waste rock stockpile area;
- Stockpiling – amendments to the volume and footprints of the stockpiles and the separation of high grade and low grade ore into individual stockpiles;
- TSF pipeline – a section of the pipeline has been re-aligned to follow an existing servitude;
- Repositioning of concentrator plants;
- Repositioning of water management structures including the stormwater dam and attenuation dams; and
- Amendments to the alignment of linear infrastructure including haul roads/internal mine roads and stormwater drains.

During the Feasibility Study, currently being undertaken, further details on the infrastructure requirements have become available which were not previously included in the EIA process undertaken in 2013.

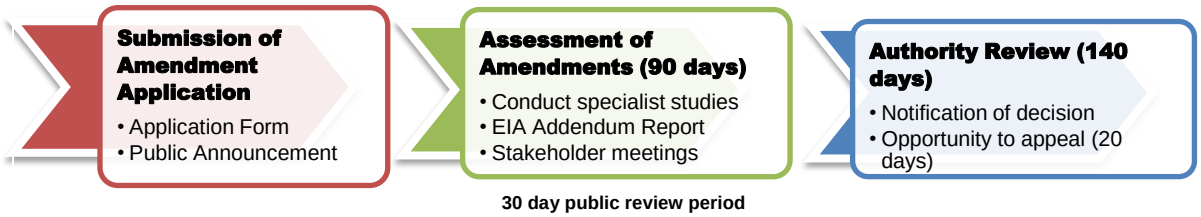
The following activities will therefore be included in the amendment process:

- Distribution powerlines and substations (<33 kV); and
- Generation of power using diesel generators (<10 MW).

It should however be noted that these additional activities do not constitute new listed activities in terms of the EIA Regulations, 2014. All activities listed above have been approved in terms of the EIA Regulations, 2010 or do not trigger the relevant thresholds in the EIA Regulations (2014) to require a new EIA process. Thus an Amendment Application Process will be undertaken to address the Project amendments.

THE AMENDMENT APPLICATION PROCESS

The Amendment Application Process will be undertaken in accordance with Regulation 31 of the EIA Regulations (GN R. 982) of December 2014 promulgated in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended (NEMA) and Section 102 in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). The Department of Mineral Resources (DMR) will be the Competent Authority on the Amendment Application and will therefore ultimately make the decision as to whether or not Ivanplats may commence with these proposed Project amendments. The details and findings of the proposed Project amendments will be addressed in an EIA Addendum Report. The process is illustrated below.



Specialist Studies

To support the Amendment Application Process, various specialist studies will be updated to determine the potential environmental and social impacts of the Project amendments. These studies include:

- Air Quality
- Noise
- Heritage
- Visual
- Traffic
- Rehabilitation
- Closure

Public Participation Process

Stakeholders affected by the Project or who are interested in the Project are invited to register as an Interested and Affected Party (I&AP) to become involved in the consultation process. Notification will be done by means of letters, newspaper advertisements, SMS, site notices and telephonic communication. The following upcoming PPP activities are envisaged to take place as indicated below:

- **Project announcement:** This Background Information Document (BID), Announcement Letter with Registration and Comment Form, site notices and media advertisement provide more information about the project, early March 2016;
- **Availability of EIA Addendum Report:** The EIA Addendum Report will be made available for review between 29 March – 28 April 2016; and
- **Stakeholder meetings:** Stakeholder meetings will be held during the week of 11 April 2016.

To ensure that you are registered as an I&AP and to receive updated project information please complete the attached registration form. Comments and registration forms can be sent to the Digby Wells Stakeholder Engagement Office at the details provided below.

Digby Wells Environmental – Stakeholder Engagement Office

Qondile Monareng or Nestus Bredenhann
Tel: (011) 789 9495 or Fax: 086 583 5715
Email: gondile.monareng@digbywells.com or nestus.bredenhann@digbywells.com

Further information regarding the Project can be found on the Digby Wells website

Website: www.digbywells.com (Public Documents)

Registered I&APs will be informed about the availability of the EIA Addendum Report and scheduled stakeholder meetings via their preferred means of communication (SMS, email, post or fax). Comments raised by stakeholders will assist in informed decision-making for authorities and provides information to be considered by the project team and specialists conducting the studies.

Project No: IVA3396 4 March 2016

Ivanplats (Pty) Ltd

Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province

Environmental Authorisation Number: 12/1/9/2-W32, Mining Right Number: LP30/5/2/2/1/10067MR

Dear Stakeholder,

Ivanplats (Pty) Ltd. (Ivanplats) intends to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (known as the Platreef Project). Digby Wells Environmental (Digby Wells) undertook the Environmental and Social Impact Assessment (ESIA) for the Platreef Project in 2013. Ivanplats obtained both the Mining Right (LP30/5/1/2/2/10067MR) and Environmental Authorisation (12/1/9/2-W32) for the Platreef Project in 2014.

Since the granting of the above-mentioned licences, Ivanplats has commenced with the sinking and development of Shaft 1 (ventilation intake shaft), as well as the establishment of supporting infrastructure including the mine boundary fence, access roads and temporary offices and workshops. The approved mine infrastructure footprint has been reduced due to the encroachment of the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities which established residential plots in close proximity to the proposed mine infrastructure area. Ivanplats has consequently revised the approved mine layout to ensure an optimum use of the reduced footprint area.

This change to the approved mine layout necessitates the requirement for an Amendment Application process to the relevant licences in terms of the Regulation 31 of the EIA Regulations (GN R. 982) of December 2014 promulgated in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended (NEMA) and Section 102 in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). The Department of Mineral Resources (DMR) will be the Competent Authority and Digby Wells Environmental has been appointed by Ivanplats as the independent Environmental Assessment Practitioner to undertake the Amendment Application process.

Project Description

The Platreef Project is located on the farms Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS situated within the Mogalakwena Local Municipality and Waterberg District Municipality in the Limpopo Province, approximately 8 km northwest of the town of Mokopane and can be accessed via the N11 Highway. The key activities and infrastructure that are proposed to be amended include, but are not limited to: the increase in height of the headgear, inclusion of a production shaft, inclusion of waste rock crushers, separation of stockpiles and an amendment to the height and footprint of the stockpiles, route amendment to the tailings storage facility pipeline, repositioning of water management structures including the stormwater dam and attenuation dams, a new stormwater drain, distribution powerlines and substations and inclusion of diesel generators.

Amended Reports Availability

The Amended Environmental Impact Assessment (EIA) Report and Environmental Management Plan (EMP) will be available to the public from ***29 March to 28 April 2016*** at the places as indicated below.

Person	Location	Contact
Rifilwe Madisa	Mogalakwena Public Library, corner Van Riebeeck and Pretorius Streets	(015) 491 9729
Lucy Mashetisho	Mahwelereng Public Library, Mahwelereng Village	078 628 3326
Qondile Monareng	www.digbywells.com (under Public Documents) or phone for CD copy	(011) 789 9495
Ivanplats SED Department	7 Second Street, Old Industrial Area, Mokopane or Ivanplats mobile SED unit	(015) 491 0600

Invitation to Public Meetings

Public Meetings will be held to discuss contents of the Amended EIA Report / EMP and to obtain stakeholder comments, as indicated below.

Date	Time	Venue
13 April 2016	13:00 – 18:00	Magongoa Village, Open Fields, Marquee Tent
13 April 2016	13:00 – 18:00	Tshamahansi Village, Open Fields, Marquee Tent

How to comment

You are invited to provide inputs on the Platreef Project Amendment Process by addressing your comments, concerns or suggestions to Digby Wells through any one of the communication media below:

- Completing the Registration and Comment Form and submitting it to the Stakeholder Engagement Office;
- Attending the Public Meetings and submitting comments;
- A letter or other form of written submission; or
- By email, fax or telephone correspondence to the Stakeholder Engagement Office.

Should you wish to be registered as an I&AP, obtain additional information or comment on the proposed development, please contact Qondile Monareng at Tel: (011) 789 9495, Fax: 086 583 5715, Post: Private Bag X10046, Randburg, 2125 or email: qondile.monareng@digbywells.com or nestus.bredenhann@digbywells.com.

Regards,



Qondile Monareng

Stakeholder Engagement Office

Enclosed

- *Background Information Document*
- *Registration and Comment Form*

DIGBY WELLS ENVIRONMENTAL

IVANPLATS (Pty) Ltd

AMENDMENT TO ENVIRONMENTAL AUTHORISATIONS FOR THE IVANPLATS PLATREEF PROJECT, NEAR MOKOPANE, LIMPOPO PROVINCE

Environmental Authorisation Number: 12/1/9/2-W32, Mining Right Number: LP30/5/2/2/1/10067MR

REGISTRATION AND COMMENT FORM

March 2016

Registered Interested and Affected Parties (I&APs) will be informed of ongoing developments via their preferred means of communication (SMS, email, post or fax). Please register as an I&AP and provide comments by sending this form, or other written correspondence, to the contact details provided below:

Qondile Monareng of Digby Wells Environmental Stakeholder Engagement Office:
Fax: 0865835715, **Telephone:** (011) 789 9495, **Postal Address:** Private Bag X10046, Randburg, 2125
Email: qondile.monareng@digbywells.com, nestus.bredenhann@digbywells.com

Please formally register me as an Interested and Affected Party (I&AP)	Yes		No	
I would like to receive my notifications by	Email	SMS	Post	Fax

Please indicate which sector you represent and also provide a name

Government Department	
Municipality	
Community	
Non-Government Organisation	
Business	

If you are a *landowner* or *land occupier*, please indicate which farm(s) and portion(s) you reside on

Landowner	
Land occupier	

Please fill in your contact details below for the project database

Title, Full Name					
Designation					
Cellphone		Fax		Tel	
Email					
Postal Address					

Environmental Impact Assessment Regulations of 2014, promulgated in terms of the National Environmental Management Act, as amended, Section 44 (1) requires that we *gather comments* from I&APs. Please complete the questions below. Should you require assistance in completing these questions please contact the Stakeholder Engagement Office contact information provided above.

How do you think the project might impact (affect) you?
How do you think the project might impact (affect) your socio-economic conditions? (e.g. livelihoods, farm, business, household)
How can these impacts be managed, avoided and / or fixed?

If you are a landowner or occupier, what is your land currently being used for?

Are there any environmental, social or heritage features on the proposed project area we need to be aware of?

Where are these found?

Do you think the project could impact (affect) infrastructure you might have? (e.g. houses, buildings, roads)

If so how can these impacts (affects) be managed, avoided or fixed?

General Comments

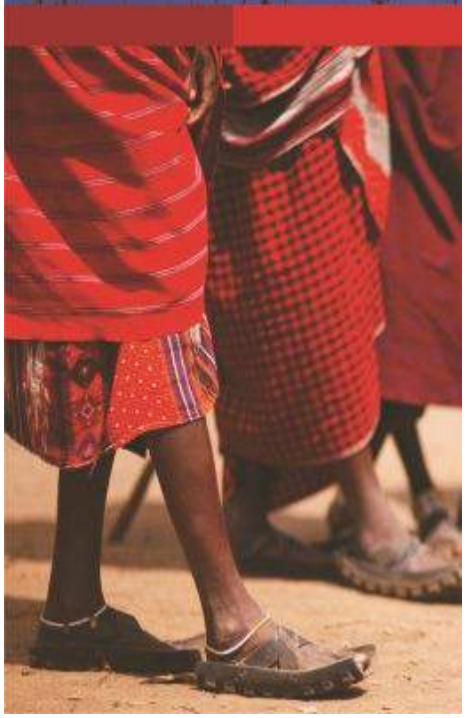
If there are any other stakeholders we should include onto the stakeholder database for the proposed project, please provide their contact details.

Title, Full Name		Title, Full Name	
Organisation		Organisation	
Cellphone		Cellphone	
Email		Email	

Signature ***Date***







DIGBY WELLS
ENVIRONMENTAL

Tokumente ya Tshedimošo ya Peleng

Kgopelo ye e Fetotšwego ya Moepo wa Platinamo wa Ka tlase ga mobu wa Platreef, kgauswi le Mokopane, Profenseng ya Limpopo

Nomoro ya Tumelelo ya Tikologo: 12/1/9/2-W32

Nomoro ya Ditokelo tša Moepo: LP30/5/2/2/1/10067MR

Nomoro ya Protšeke:
IVA3396

E beakanyeditšwe:
Ivanplats (Pty) Ltd.

Hlakola 2016

Digby Wells and Associates (South Africa) (Pty) Ltd
(Karolo ya Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Mogala: +27 11 789 9495, Fekse: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Balaodi: AJ Reynolds (Chairman) (British)*, GE Trusler (C.E.O), B Beringer, LF Koeslag, J Leaver*, NA Mehlomakulu, DJ Otto
*Wa go hloka maikarabelo a bolaodi

TSHEDIMOŠO YA PELENG YA PROTŠEKE

Ivanplats (Pty) Ltd. (Ivanplats) beakanyetša go hlabolla le go laola moepo wa ka tlase ga mobu le mananeolgoparara ao a amanago le wona , kgauswi le Mokopane, Profenseng ya Limpopo (e tsebegago bjalo ka Protšeke ya Platreef). Digby Wells Environmental e dirile Tshekatsheko ya Seabe sa Tikologo le Leago ebago ESIA bakeng sa protšeke ya Platreef ka ngwaga wa 2013. E sa le Ivanplats e fiwa dilaesense tša go fapana go thoma ka mešomo ye e amanago le Protšeke ya Platreef. Gagolo, dilaesense tše di latelago di abetšwe bakeng sa Protšeke:[1]

- **Tumelelo ya Tikologo (EA)** yeo e ngwadilwego letšatšikgwedi la 27 Ngwatobošego 2014 ka tšhupetšo ya 12/1/9/2-W32 ye e hlagišitšwego ke Kgoro ya Tlhabollo ya Ekonomi, Tikologo le Boeti (LEDET). Ka morago ga fao, Ivanplats e ile ya dira kgopelo ya gomme ya abelwa Diphetošo tše di latelago tša Tumelelo ya Tikologo
  - Phetošo ya Tumelelo ya Tikologo (19 Phato 2014) yeo e amanago le diphetošo tše nnyane tša maemo a tumelelo; le
  - Phetošo ya Tumelelo ya Tikologo (30 Phupu 2015) yeo e amanago le Lefelo la Bobolokelo la Dinyakišišo (TSF) go tšwa Polaseng ya Turfspruit go ya Polaseng ya Rietfontein.
- **Tokelo ya Moepo (MR)** yeo e ngwadilwego letšatšikgwedi la 04 Dibatsela 2014 ka tšhupetšo ya LP30/5/2/2/1/10067MR yeo e abilwego ka Kgoto ya Methopo ya Diminerale (DMR); le
- **Laesense ya Taolo ya Matlakala (WML)** yeo e ngwadilwego letšatšikgwedi la 13 Hlakola 2015 ka tšhupetšo ya 12/9/11/L1224/5 ye e hlagišitšwego ke Kgoro ya Bosetšhaba ya Merero ya Tikologo (DEA).

Go tloga ka nako yeo dilaesense tše go bolelwago ka tšona di abjago ka yona, Ivanplats e thomile ka go epa goba go hlabolla Šafote ya 1 (šafote ya tsenyomoya). Godimo ga moo, mananeokgoparara a mangwe ka meepong a hlomilwe go thekga go epša ga Šafote ya 1, go akaretšwa tsela ya phihlelelo ya moepo, legora la mollwane le dinolofatši tša nakwana tša go swana le diwekšopo le dikantoro.

Nakong kgato ya go hlongwa ga lefelo la Protšeke ya Platreef, ditšhaba tša Ga-Kgobudi le Ga-Kgobudi 2 (Mzombane) di ile tša hloma dipoloto tša bodulo kgauswi le tikologo ya mananeokgoparara a moepo wo o šišintšwego Peakanyo ya mananeokgoparara ao a dumeletšwego a moepo a na le palomoka ya bogolo bja dihektare tše 420 (hektare), yeo gabjale e fokoditšwego go dihektare tše 346 ka ba ka la hektare ka lebaka la tlolomolao. Ka gona Ivanplats e bušeleditše peakanyo ye e dumeletšwego ya moepo go netefatša tšhomišo ye kaone ya mohlala wa mananeokgoparara

Phetošo efe goba efe ye e lego go peakanyo ya moepo e hloka dinyakwa tša phetošo go dilaesense tša maleba, mo mabakeng a tikologo (12/1/9/2-W32), go ya ka Molawana wa 31 ya Tekolo ya Seabe sa Tikologo ya (EIA) wa 2014 le Tokelo ya Moepo (LP30/5/2/2/1/10067MR) go ya ka Karolo ya 102 ya Molao wa Tlhabollo ya Methopo ya Diminerale le Petroleamo wa 2002 (Molao wa 28 wa 2002).

[1] Ivanplats e rometše Sampolo ka Bontši (Šafote ya 1) Kgopelo ya Tšhomišo ya Meetse go Kgoro ya Meetse le Kelelatšhila (DWS) gomme e swanetše go romela gape Kgopelo ya Laesense ya Tšhomišo ya Meetse (WULA) bakeng sa Protšeke ya Platreef ka botlalo go Kgoro ya Meetse le Kelelatšhila (DWS). Bakgathatema ba Protšeke ba tla tsebišwa ka ga go ba gona ga WULA go lekodišiša lefsa le go fa ditshwaotshwao.

Tukumente ye ya Tshedimošo ya Peleng (BID) e tšweleditšwe go:

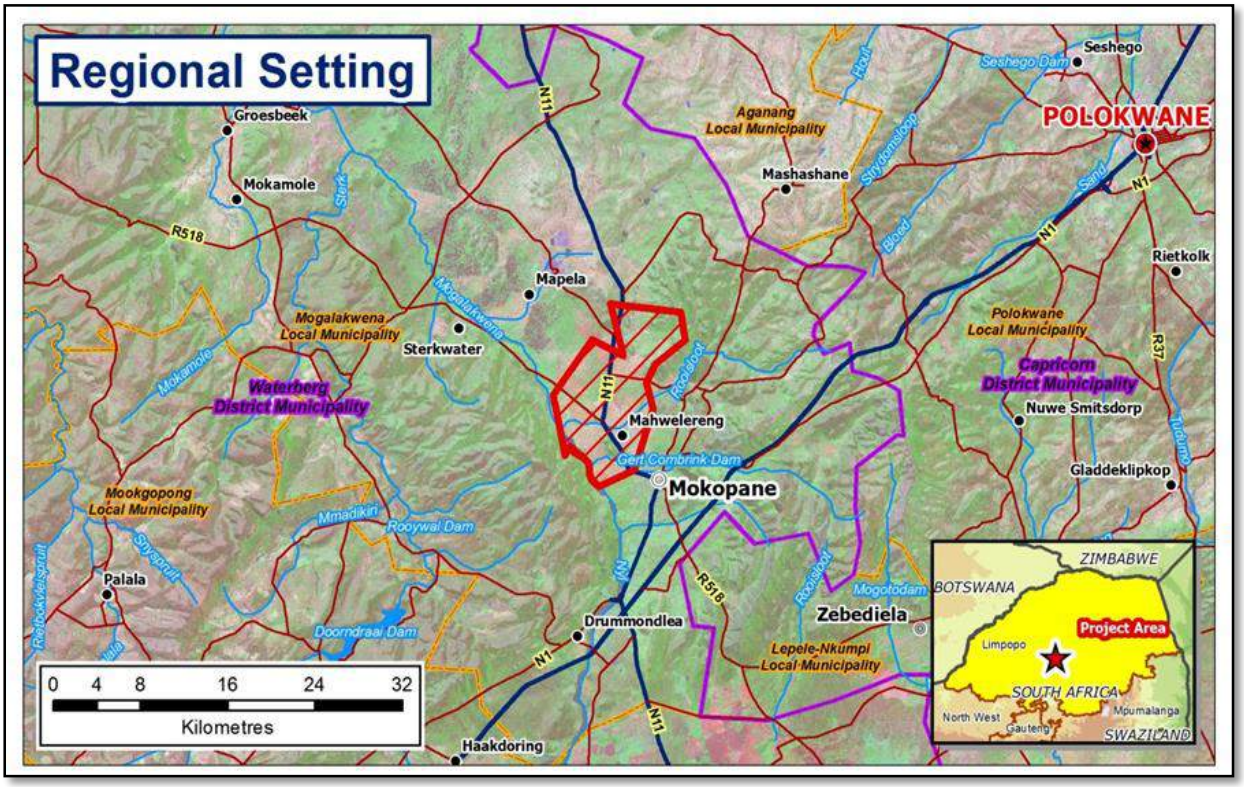
- Hlagiša tlhalošo ya Protšeke ya Platreef
- Hlagiša kakaretšo ya Tshepedišo ya Kgopelo ye e Fetotšwego yeo e laeditšwego go ya ka Molao wa Bosetšhaba wa Taolo ya Tikologo Moloa wa 107 wa 1989 (NEMA) le Molawana wa Tekolo ya Seabe sa Tikologo wa 2014
- Hlagiša dintlha tša Tshepedišo ya go Kgatha tema ga Setšhaba (PPP) le ka fao bakgathatema ba ka amegago ka gona.

Digby Wells Environmental ba thwetšwe ke Ivanplats gomme maikarabelo a bona e tla ba go phethagatša tshepedišo ya Tshepedišo ya Kgopelo ye e Fetotšwego ya EA le ditekolo tša tlaleletšo tša ditsebi.

TLHALOŠO YA PROTŠEKE

Lefelo la Protšeke

Protšeke ya Platreef e dipolaseng tša Macalacaskop 243 KR, Turfspruit 241 KR le Rietfontein 2 KS gomme e Mmasepaleng wa Selegae wa Mogalakwena le Mmasepaleng wa Tikologo wa Waterberg ka Profenseng ya Limpopo. Tikologo ye e dumeletšwego ya Moepo ke dipolasa tša Macalacaskop 243 KR le Turfspruit 241 KR, ka bogolo bjo bo kopantšwego bja 7841.265 hektare. Tumelelo ya Tikologo ke dipolasa ka moka tše tharo. Protšeke e dikilometara tše ka bago tše 280 km bohlabelaleboa bja Johannesburg le 8 km leboabohlabela bja toropo ya Mokopane gomme e ka fihlelelwa ka Tselakgolo ya N11.



Peakanyo ya 1: Peakanyo ya Selete ya Protšeke ya Platreef

Diphetošo tša Protšeke tše di Šišintšwego

Mešomo le mananeokgoparara ye e šišintšwego e swanetše go fetolwa a laeditšwe ka tlase. Gagologolo, bogolo, mehlala, maemo le / goba botelele bja mananeokgoparara ao a laeditšwego ka tlase a fetotšwe go akaretša mehlala ye e fokoditšwego ya peakanyo ya mananeokgoparara a moepo Diphetošo tše bohlokwa tše di ka mokgwa wo o latelago:

- Sešireletšahlogo sa Šafote ya 2 – e oketšegile ka botelele bja 96 m;
- Dišafote – Šafote e 1 ya tšweletšo le dišafote tše 4 tša tsenyomoya (maemo a tsenyomoya a fetogile);
- Didirišwa – go akaretšwa le sedirišwa sa ka godimo ga mobu sa go šila maswika a ditšhila ka dikgoboketšong bja maswika a ditšhila;
- Go kgoboketša diphahlo – diphetošo go bontši le mehlala ya go kgoboketša diphahlo le karoganyo ya kreiti godimo le kreiti ya fase ya maswika go kgoboketšo ya phahlo ka noši;
- Phaephe ya TSF – karolo ya phaephe e beakantšwe lefsa go latela sebitšhute ye e lego gona;
- Peakanyo lefsa ya dipolante tša go tšweletša borale;
- Peakanyo lefsa ya dibopego tša taolo ya meetse go akaretšwa le letamo la meetsefula le matamo ao a fokotšegago; le
- Diphetošo go beakanya mananeokgoparara a ditlhamo go akaretšwa le ditsela tša go goga / ditsela tša ka gare tša moepo le le peakanyoboelatšhila ya meetsefula

Nakong ya Dinyakišišo tša Kgonagalo ya protšeke, gabjale e dirwago, dintlha ka botlalo ka ga dinyakwa tša mananeokgoparara di ile tša hwetšagala tšeo di bego di sa akaretšwa peleng ka gare ga tshepedišo ya EIA yeo e dirilwego ka 2013.

Ka gona mešomo ye e latelago etla akaretšwa ka go tshepedišo ya phetošo:

- Kabo ya mohlagase le ditiši tša mohlagase (<33 kV); le
- Phehlo ya mohlagase kago šomiša ditšeneraithara tša tisele (<10 MW).

Go swanetše go lemogwa gore mešomo ye ya tlaleletšo ga e hlome mešomo e meswa yeo e laeditšwego go ya ka Melawana ya EIA ya 2014. Mešomo ka moka ye e laeditšwego ka godimo e dumeletšwe go ya ka Melawana ya EIA ya 2010 goba ga e hlohleletše magato a maleba ka go Melawana ya EIA (2014) go nyaka tshepedišo ye mpsha ya EIA. Ka gona Tshepedišo ya Kgopelo ye e Fetotšwego e tla dirwa go šomana ka mathata a diphetošo tša Protšeke.

TSHEPEDIŠO YA KGOPELO YE E FETOTŠWEGO

Tshepedišo ya Kgopelo ye e Fetotšwego e tla dirwa go šomana ka mathata a diphetošo tša Protšeke go ya ka molawana wa 31 wa Melawana ya EIA (GN R. 982) wa Manthole 2014 wo o tsebagaditšwego ya ka Molao wa Bosetšhaba wa Taolo ya Tikologo wa 1998 (Molao wa 107 wa 1998) bjalo ka ge o fetotšwe (NEMA) le Karolo ya 102 go ya ka Molao wa Tlhabollo ya Methopo ya Diminerale le Petroleamo wa 2002 (Molao wa 28 wa 2002). Kgoro ya Methopo ya Diminerale (DMR) e tla ba Taolo ya Bokgoni go Kgopelo ya Phetošo gomme mafelelong e tla tšea sephetho mabapi le ge eba Ivanplats e ka thoma ka ga diphetošo tše tša Protšeke tše di šišintšwego. Dintlha le diphihlelelo tša diphetošo tša Protšeke tše di šišintšwego di tla rarollwa ka go Pego ya Tlaleletšo ya EIA. Tshepedišo e bontšhwa mo tlase.



Dinyakišišo tše di Kgethegilego

Go thekga Tshepedišo ya Kgopelo ya Phetošo, dinyakišišo tša go fapana tše di kgethegilego di tla mpshafatšwa go laetša kgonagalo ya diabe tša tikologo le leago ya diphetošo tša Protšeke. Dinyakišišo tše di akaretša:

- Boleng bja Moya
- Modumo
- Bohwa
- Ya go bonwa
- Dinamelwa
- Tsošološo
- Tswalelelo

Tshepedišo ya go kgatha tema ga setšhaba.

Bakgathatema bao ba anwago ke Protšeke goba bao ba nago le kgahlego ya Protšeke ba laletša bjao ka Bakgathatema ba go ba le kgahlego le bao ba angwago (I&AP) go kgatha tema tshepedišong ya ditherišano. Tsebišo e tla dirwa ka mokgwa mangwalo, dipapatšo tša kuranta, SMS, ditsebišo tša lefelong le kgokaganyo ka mogala. Go holofewa gore mešomo ye e latelago ya PPP e tla diragala ka mokgwa wa ka tlase:

- **Tsebišo ya protšeke:** Tokumente ye ya Tshedimošo ya Peleng (BID), Lengwalo la Tsebišo ka Foromo ya Ngwadišo le Tshwaotshwao, ditsebišo ka lefelong le dipapatšo tša di fa tshedimošo ka botlalo ka ga protšeke, mathomong a kgwedi ya Hlakola 2016;
- **Go hwetšagala ga Pegotlaleletšo ya EIA:** Pegotlaleletšo ya EIA e tla hwetšagala go lekodišiša lefsa magareng ga 29 Hlakola – 28 Moranang 2016; le
- **Dikopano tša bakgathatema:** Dikopano tša bakgathatema di tla swarwa nakong ya beke ya 11 Moranang 2016.

Go netefatša gore o ngwadišitšwe bjalo ka I&AP le go amogela tshedimošo ya protšeke ye e mpshafaditšwego o kgopelwa go tlatša foromo ya ngwadišo ye e kgomagantšwego. Ditshwaotshwao le diforomo tša ngwadišo di ka romelwa Kantorong ya Ditherišano le Baamegi dintlheng tše di filwego ka tlase.

Digby Wells Environmental – Kantoro ya Ditherišano le Baamegi

Qondile Monareng goba Nestus Bredenhann
Mogala: (011) 789 9495 goba Fekese: 086 583 5715
Imeile: qondile.monareng@digbywells.com goba nestus.bredenhann@digbywells.com

Tshedimošo ka botlalo mabapi le Protšeke e ka hwetšwa wepsaeteng ya Digby Wells website *Wepsaete: www.digbywells.com (Public Documents)*

Di-I&APs tše di ngadišitšwego di tlatsebišwa ka ga khwetšagalo ya EIA Pegotlaleletšo ya EIA le dikapoano tše di beakantšwego tša baamegi ka tsela ye e ratwago ke bona ya kgokagano (SMS, selefoune, Imeile, poso goba fekese). Ditshwaotshwao tšeo di hlagišitšwego ke bakgathatema di tla thuša boloadi go tšea diphetho le go fa tshedimošo gore e akanywe ke sehlopha sa protšeke le ditsebi tšeo di diragodi dira dinyakišišo.

Nomoro ya Protšeke: IVA3396 4 Hlakola 2016

Ivanplats (Pty) Ltd

Kgopelo ye e FetoTšwego ya Moepo wa Platinamo wa Ka tlase ga mobu wa Platreef, kgauswi le Mokopane, Profenseng ya Limpopo

Nomoro ya Tumelelo ya Tikologo: 12/1/9/2-W3, Nomoro ya Tokelo ya Moepo: LP30/5/2/2/1/10067MR

Moamegi yo rategago,

Ivanplats (Pty) Ltd. (Ivanplats) beakanyetša go hlabolla le go laola moepo wa ka tlase ga mobu le mananeokgoparara ao a amanago le wona , kgauswi le Mokopane, Profenseng ya Limpopo (e tsebegago bjalo ka Protšeke ya Platreef). Digby Wells Environmental (Digby Wells) e dirile Tshekatsheko ya Seabe sa Tikologo le Leago ebago (ESIA) bakeng sa protšeke ya Platreef ka ngwaga wa 2013. Ivanplats e hweditše bobedi Tokelo ya Moepo (LP30/5/1/2/2/10067MR) le Tumelelo ya Tikologo (12/1/9/2-W32) bakeng sa Protšeke ya Platreef ka 2014.

Go tloga ka nako yeo dilaesense tše go bolelwago ka tšona ka godimo di abjago ka yona, Ivanplats e thomile ka go epa le go hlabolla Šafote ya 1 (šafote ya tsenyomoya) gammogo le go hlama mananeokgoparara a thekgo go akaretšwa le legora la mollwane wa moepo, tsela ya phihlelelo le dikantoro tša nakwana gammogo le diwekšopo. Mohlala wa mananeokgoparara a moepo wo o dumeletšwego o fokoditšwe ka baka la gore ditšhaba tša Ga-Kgobudi le Ga-Kgobudi 2 (Mzombane) di ile tša hloma dipoloto tša bodulo kgauswi le tikologo ya mananeokgoparara a moepo wo o šišintšwego. Ka gona Ivanplats e bušeleditše peakanyo ye e dumeletšwego ya moepo go netefatša tšhomišo ye kaone ya mohlala wo o fokoditšwego wa mananeokgoparara.

Phetogo ye ya peakanyo ye e dumeletšwego ya moepo e ile ya hloka gore go be le dinyakwa tša Tshepedišo ya Kgopelo ye e Fetotšwego go dilaesense tša maleba go ya ka Molawana wa 31 wa melawana ya EIA (GN R. 982) wa Manthole 2014 wo o tsebagaditšwego go ya ka Molao wa Bosetšhaba wa Taolo ya Tikologo wa 1998 (Molao wa 107 wa 1998) bjalo ka ge o fetotšwe (NEMA) le Karolo ya 102 go ya ka Molao wa Tlhabollo ya Methopo ya Diminerale le Petroleamo wa 2002 (Molao wa 28 wa 2002). Kgoro ya Methopo ya Diminerale (DMR) e tla ba Taolo ya Bokgoni go Kgopelo gomme Digby Wells Environmental (Digby Wells) e thwetšwe ke Ivanplats bjalo ka Modiragatši wa go Ikema wa Tshekatsheko ya Tikologo go phethagatša tshepedišo ya Kgopelo ye e fetotšwego.

Tlhalošo ya Protšeke

Protšeke ya Platreef e dipolaseng tša Macalacaskop 243 KR, Turfspruit 241 KR le Rietfontein 2 KS gomme e ka gare ga Mmasepala wa Selegae wa Mogalakwena le Mmasepala wa Tikologo wa Waterberg ka Profenseng ya Limpopo. Mešomo ye bohlokwa le mananeokgoparara ao a šišinywago go fetošwa a akaretša eupša a sa kgaoletšwe go: koketšo ya sešireletšahlogo, kakaretšo ya šafote ya tšweletšo, kakaretšo ya didirišwa tša go pšhatla maswika a ditšhila, karoganyo ya mekgobo ya phahlo le phetošo ya tsela ya phaephe ya senolofatši sa bobolokelo, peakanyo lefsa ya dibopego tša taolo ya meetse go akaretšwa le letamo la meetsefula le matamo ao a fokotšegago; peakanyoboelatšhila ya meetsefula ye mpsha , diphaephe le ditiši tša kabo ya mohlagase go akaretšwa le ditšenereithara tša tisele.

Khwetšagalo ya Dipego tša go fetošwa

Pego ya Tshekatsheko ya Seabe sa Tikologo ye e Fetotšwego (EIA) le Leano la Taolo ya Tikologo (EMP) di tla hwetšagala go setšhaba go tloga ka la 29 Hlakola go fihla ka 28 Moranang 2016 mafelong a a laeditšwego ka tlase.

Motho	Lefelo	Nomoro ya boikgokaganyo
Rifilwe Madisa	Bokgobapuku bja Setšhaba bja Mogalakwena, khona ya Mmila wa Van Riebeeck le Pretorius	(015) 491 9729
Lucy Mashetisho	Bokgobapuku bja Setšhaba bja Mahwelereng, Motseng wa Mahwelereng g	078 628 3326
Qondile Monareng	www.digbywells.com (ka tlase ga Ditokumente tša Setšhaba) goba o letše bakeng sa khophi ya CD	(011) 789 9495
Kgoro ya SED ya Ivanplats	7 Mmila wa Second, Old Industrial Area, Mokopane *goba* Ivanplats *mobile SED unit*	(015) 491 0600

Taletšo ya Dikopano tša Setšhaba

Dikopano tša setšhaba di tla swarwa go ahlaahla diteng tša Pego ya EIA ye e fetotšwego /EMP lego hwetša ditshwayotshwayo, bjalo ka ge go laeditšwe ka tlase.

Letšatšikgwedi	Nako:	Lefelo
13 Moranang 2016	13:00 – 18:00	Motseng wa Magongoa, Lefelong le le bulegilego, Tenteng ya Marquee
13 Moranang 2016	13:00 – 18:00	Motseng wa Tshamahansi, Lefelong leo le bulegilego, Teneteng ya Marquee

Ka fao o ka dirago ditshwayotshwayo ka gona

O laletšwa go fa maikutlo ka ga Tshepedišophetošwa ya Protšeke ya Platreef ka go fa ditshwayotshwayo tša gago, dipelaelo goba ditšhišinyo ka e tee ya kgokagano ya bobegaditaba ya ka tlase:

- Tlatša Foromo ya Ngwadišo le Ditshwayotshwayo gomme wa e romela go Kantoro ya Kamano le Bakgathatema;
- Go tsenela dikopano tša setšhaba le go romela ditshwayotshwayo;
- Lengwalo goba mokgwa o mongwe wa thomelo ya go ngwalwa; goba
- Ka imeile, fekese goba ka kgokaganyo ya mogala go Kantoro ya Dikamano le Mokgathatema

Ge o nyaka go ingwadiša bjalo ka I&AP, go hwetša tshedimošo ya tlaleletšo goba gofa ditshwayotshwayo mabapi le tlhabollo ye e šišintšwego, o kgopelwa gore o ikgokaganye le Qondile Monareng ka Mogala: (011) 789 9495, Fekese: 086 583 5715, Poso: Private Bag X10046, Randburg, 2125 goba imeile: qondile.monareng@digbywells.com goba nestus.bredenhann@digbywells.com.

Madume,



Qondile Monareng

Kantoro ya Ditherišano le Baamegi

Go akareditšwe

- *Tokumente ya Tshedimošo ya Peleng*
- *Foromo ya ngwadišo le Ditshwayotshwayo*

DIGBY WELLS
ENVIRONMENTAL

IVANPLATS (Pty) Ltd

PHETOGO YA DITUMELELO TŠA TIKOLOGO BAKENG SA PROTŠEKE YA IVANPLATS PLATREEF PROJECT, KGAUSWI LE MOKOPANE, PROFENSENG YA LIMPOPO

Nomoro ya Tumelelo ya Tikologo: 12/1/9/2-W3, Nomoro ya Tokelo ya Moepo: LP30/5/2/2/1/10067MR

FOROMO YA NGWADIŠO LE DITSHWAYOTSHWAYO

Hlakola 2016

Bakgathatema bao ba Ngwdišitšwego lebao ba Amegago (Di-I&APs) ba tla tsebišwa ka ga ditlhabollo tša go tšwela pele ka mokgwa wo o ratago ke bona wa boikgokaganyo (SMS, selefoune, imeile, poso goba fekese). O kgopelwa go ingwadiša bjalo ka I&AP le go fa ditshwayotshwayo ka go romela foromo ye, goba ka kgokaganyo ya go ngwalwa, go dintlha tša boikgokaganyo tše di latelago:

Qondile Monareng wa Digby Wells Environmental Kantoro ya Ditherišano le Baamegi:
Fekese: 0865835715, Mogala: (011) 789 9495, Aterese ya Poso: Private Bag X10046, Randburg, 2125
Imeile: qondile.monareng@digbywells.com, nestus.bredenhann@digbywells.com

Ka kgopelo nngwadiše bjalo ka Mokgathattema wa go ba le Kgahlego yo a Agegago (I&AP)	Ee		Aowa	
Ke rata go amogela ditsebišo tša ka ka	I-meile	SMS	Poso	Fekse

Ka kgopelo laetša lekala le o le emelago gomme o fe gape leina la lona

Kgoro ya Mmušo	
Mmasepala	
Setšhaba	
Mokgatlo wo e sego wa mmušo	
Kgwebo	

Ge o le mongmobu goba modudi wa naga, o kgopelwa go laetša gore ke (di)polasa le (di)karolo efe yeo o dulago go yona

mongmobu	
Modudi wa naga	

O kgopelwa go tlatša dinomoro tša gago tša boikgokaganyo ka tlase bakeng sa dathapeisi ya protšeke

Thaetlele, Leina ka botlaloe					
Maemo					
Selfoune		Fekse		Mogala	
I-meile					
Atrese ya Poso					

Melawana ya Tshekatsheko ya Seabe sa Tikologo ya 2014, yeo e tsebagaditšwego go ya ka Molaoa wa Bosetšhaba wa Taolo ya Tikologo, bjalo ka ge o fetotšwe, Karolo ya 44 (1) re nyaka gore re kgoboketše ditshwayotshwayo go tšwa go di-I& APS. O kgopelwa gore o tlaŠe dipotšišo tše di lego ka tlase. Ge o e le gore o nyaka thušo ya go tlatša dipotšišo tše o kgopelwa go ikgokaganya le Kantoro ya Ditherišano le Moamegi yeo e filwego ka godimo.

Naa o nagana gore protšeke e ka go huatša (ama) bjang?
Naa o nagana gore protšeke e ka huatša (ama) bjang maemo a gago a ekonomi ya leago? (go fa mohlala, maphelo, polasa, kgwebo, lapa)

Naa diabe tše di ka laolwa, efogwa le/goba go lokišwa bjang?
Ge e le gore o mongmobu goba modudi, naa naga ya gago gabjale e šomišetšwa eng?
Naa go na le dibopego tša tikologo, leago, goba bohwa mo tikoogong yeo protšeke e šišintšwego yeo re swanetšgo e lemoga?
Tšona di hwetšagala kae?
Naa o nagana gore protšeke e ka huetša (ama) mananeokgoparara ao o nago lewona? (go fa mohlala, dintlo, meago, ditsela)
Ge go le bjalo diabe (dikamo) tše di ka laolwa, efogwa, lokišwa bjang Naa diabe tše di ka laolwa, efogwa le/goba go lokišwa bjang?

Ditshwayotshwayokakaretšo

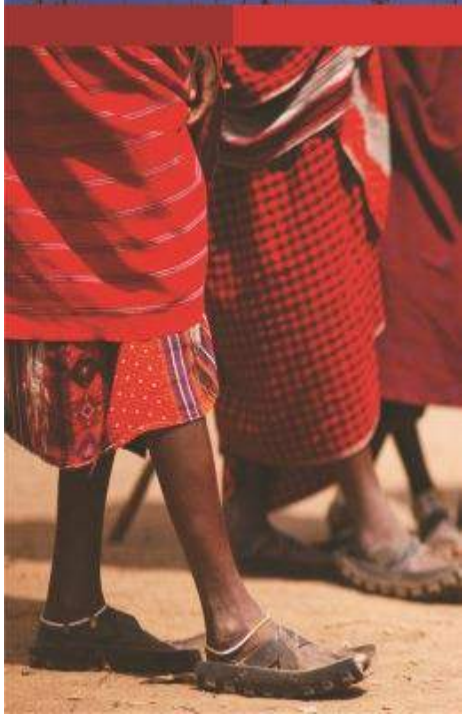
Ge e le gore go na le baamegi ba bangwe bao re swanetšego go go ba akaretša ka go dathapeisi ya baamegi bakeng sa protšeke ye e šišinywago, o kgopelwa go fana ka dintlha tša bona tša boikgokaganyo.

Thaetlele, Leina ka botlaloe		Thaetlele, Leina ka botlaloe	
Mokgatlo		Mokgatlo	
Selfoune		Selfoune	
I-meile		I-meile	

Tshaeno ***Letšatšikgwedi***







DIGBY WELLS
ENVIRONMENTAL

Matimu Ya Tsalwa Ra Marungula

Xikombelo Xa Kuncinca Xa Plaatreef, Mugodi Wa Le Hansi Lowu Nga Ekusuhi Na Mokopane Exifundzeninkulu Limpopo.

Mpfumelelo wa Timhaka ta Mbango: 12/1/9/2-W32

Mpfumelelo wo Cela Mugodi: LP30/5/2/2/1/10067MR

Nomboro ya Phurojeke:
IVA3396

Lulamiseriwile:
Ivanplats (Pty) Ltd.

Nyenyankulu 2016

Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: AJ Reynolds (Chairman) (British)*, GE Trusler (C.E.O), B Beringer, LF Koeslag, J Leaver*, NA Mehlomakulu, DJ Otto
*Non-Executive

NHLAMUSELO YA PHUROJECKE

Ivanplats (Pty) Ltd. (Ivanplats) yi tiyimisele ku aka no tirhisa Mugodi wale hansi wa Pulatinamu na switirhisiwa leswi fambelanaka na swa mugodi kumbe mayini ekusuhi na Mokopane, exifundzeninkulu xa Limpopo (leyitivekaka hi Phurojeke ya Platreef). Digby wells hi yona yi hundiseke Mahlelelo ya Ntshikelelo wa Mbango na vanhu eka Phurojeke ya Plaatreef hi lembe ra 2013). Ivanplats yikumile mimpfumelelo yo hambana hambana ku sungula hi mingingiriko eka Phurojeke ya Plaatreef. Mimpfumelelo leyi nga humesiwa hi leyi landzelaka:

Project:

- **Mpfumelelo wa swa Timhaka ta Mbango (EA)** hi siku ra 27 Khotavuxika 2014 wa tsalwa ra 12/1/9/2-W32 lowu nga pasisiwa no nyikiwa hi va Ndzawulo ya Nhluvukiso wa Ikhonomi ya Limpopo, Vuphumba na Timhaka ta Mbango (LEDET). Nakambe Ivanplats yi endlile swikombelo swocinca eka Mpfumelelo wa swa Timhaka ta Mbango naswona yi nyikiwile mpfulelelo wo cinca eka mimpfumelelo ya swa Timhaka ta Mbango leyi landzelaka:
  - Kuncinca eka Mpfumelelo wa swa Timhaka ta Mbango (19 Mhawuri 2014) lowu fambelanaka ka kucinca kutsongo eka swimpimelo swo pasisa; na
  - Kuncinca eka Mpfumelelo wa swa Timhaka ta Mbango Amendment (30 Mawuwani 2015) loku fambelanaka na kucinca ka ndhawu yo tshama ka damu rochela thyaka rale mayini (TSF) kusuka purasini ra Turfspruit kuya purasini ra Rietfontein.
- **Mpfumelelo wo Cela Mugodi (MR)** hi siku ra 04 Hukuri 2014 wa tsalwa ra LP30/5/2/2/1/10067MR lowu nga pasisiwa hi va Ndzawulo ya Switirhisiwa swa Timinerali (DMR); na
- **Layisense ya Mafambiselo ya Thyaka (WML)** hi siku ra 13 Nyenyankulu 2015 wa tsalwa ra 12/9/11/L1224/5 lowu nga pasisiwa no nyikiwa hi va Ndzawulo ya Timhaka ta Mbango (DEA).

Kusukela loko loko ti layisense leti hlayiweka laha henhla ti nyikiwile, Ivanplats yi sungurile mingingiriko yo celela no aka shaft1 (shaft leyi nghenisaka moya emugodini), xikanwe na switirhisiwa swa le mugodini leswi katsaka rihlampfu ra ndzilikano wa mugodi, mapatu, tihofisi ta nkarhinyana na tiwekishopo.

Enkarhini lowu kunga sunguriwa mingingiriko ya Phurojeke ya Plaatreef, vaaka tiko vale ka Ga-Kgobudi na vale ka Ga-Kgobudi 2 (Mzombane) va sungurile ku aka ekusuhi swinene na ndhawu leyi ayi hlawuriwilw ya switirhisiwa swa mayini. Ndzilikano lowu nga pfumeleriwa wa switirhisiwa swa mayini awuri na kolomu ka 420 wa tihekitara (ha), lowu sweswi wunga hungusiwa kuya kolomu ka 346 wa tihekitere hi kokwalaho ka ku tshunela ka vaaki. Ivanplats yi pfuxetile ndzilikano wa yona lowunga pfumeleriwa wa mugodi ku yita kota kutirha hiku hetiseka eka ndhawu leyi hungusiweke.

Kucinca ko karhi eka ndzilikano wa mayini lowu pasisiweke swiendle leswaku kuva na xikombelo xo cinca eka ti layisense, eka lyi mhaka kucinca ka Mpfumelelo wa Timhaka ta Mbango (12/1/9/2-W32) hikuya hi milawu ya Regulation 31 ya EIA (GNR 982) ya Nwendzamhala hi lembe ra 2014 na Mpfumelelo Wo Cela Mugodi (LP30/5/2/2/1/10067MR) hikuya hi xiyenge xa 102 xa Nawu wa Nhluvukiso wa Switirhisiwa swa Swicelwa na Mafurha, 2002 (Nawu wa 28 wa 2002).

Tsalwa leri ra Mahungu ya Vuyimelo ri tsaleriwile leswaku rita:

- Nyika nhlamuselo ya Phurojheke ya Platreef
- Nyika hiku komisa mafambiselo ya xikombelo xa kuncinca tani hiloko swi tsariwile eka Nawu wa Rixaka wa Mafambiselo ya Mbango Nawu wa No. 107 wa 1998 (NEMA) na swilawana swa Mahlelelo ya Ntshikelelo wa mbango (EIA) swa lembe ra 2014
- Nyika hi vuendzi ta Maendlelo yo Nghenisa xandla hi Vaaki (PPP) na ku nyika tindlela leti lava khumbekaka vanga ti nghelerisa hakona ka Phurojeke.

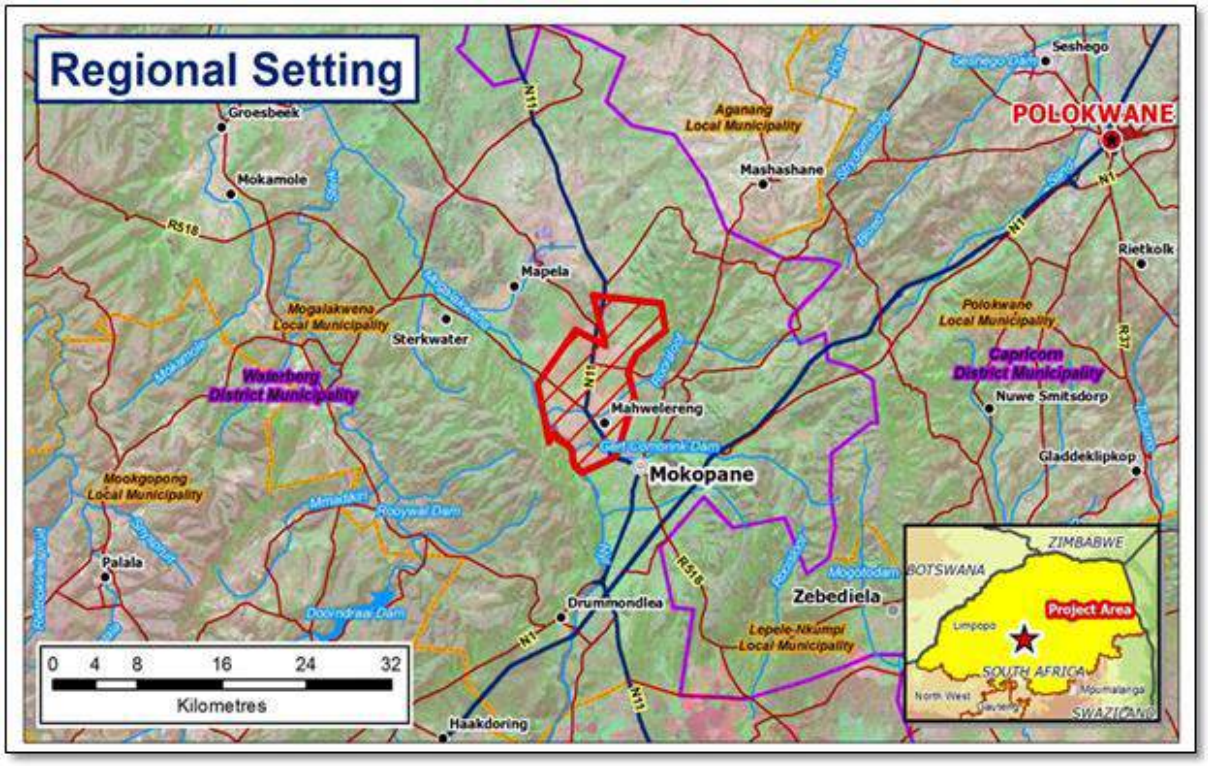
Digby Wells Environmental Digby Wells Environmental yi thoriwile hi Ivanplats ku fambisa purosese ya xikombelo xa kucinca ka Mpfumeleo wa Timhaka ta Mbagvgo xa Plaatreef na ku hundzisa tidyondzo ta vutivinkulu to engetelela.

NHLAMUSELO YA PHUROJEKE

Ndhawu ya Phurojeke

Phurojeke ya Plaatreef yile emapurasini ya Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS lawa ya welaka ehansi ka Masipala wa muganga wa Mogalakwena eka Masipala wa xifundza xa Waterberg wa xifundzankulu wa Limpopo. Ndhawu ya mugodi kumbe mayini leyi ka pasisiwa yi katsa mapurasi ya Macalacaskop 243 KR, Turfspruit 241 KR lawa ya ngana kolomu ka 7841.265 ya tiheketara loko yanganisiwile. Mpfumelelo wa Timhaka ta Mbango wo katsa hikwawo mapurasi manharhu.

Phurojeke yi kumeka kwolomu ka 280 km nwalungu vuhumadyambu bya Joni na kwalomu ka 8 km nwalungu vupeladyambu bya doroba ra Mokopane. Ndhawu ya phurojeke yi fikeleriwa hi ku tirhisa gondzo ra N11.



Plan 1: Regional Setting of the Platreef Project

Kuncinca loko Pimiweke ka Phurojeke

Mingingiriko na switirhisiwa leswi pimiweke ku cinciwa swi tsariwile la hansi. Mindzilikano, tindhawu na ku hela ka switirhisiwa leswi tsaliweke laha hansi swi cinciwile ku endlela leswaku rita ringana eka ndzilikano wa mayini lowu hungusiweke. Leswinga cinciwa hi leswi landzelaka:

- Vuaki bya timhandze na swidloko 2 – ku engetela ku leha kuya ka 96 m;
- Vuaki bya timhandze – 1 vuaki bya timhandze byo tirhela na 4 ya vuako bya timhandze byo ghenisa moya (tindhawu ta vuaki bya timhandze lebyi nghenisaka moya emugodini ti cincile);
- Kusila – kuta katsiwa ndhawu ya le rivaleni yo sila ribye ra thyaka eka ndhawu yo veka ndhundhuma ya thyaka;
- Ndhawu ya vekela swicelwa – kucincwa ka ku anama ka ndhawu yo vekela swicelwa na swona swicelwa swita hambanisiwa hikuya hi ntikelo wale henhla kuya ka ntikelo wale hansi na swona swita vekiwa eka ti ndhawu to hambana;
- Payipi yo fambisa thyaka ra le mayini (Payipi ya TSF) – xiphemu xa payipi xi ololoxiwile ku landzela ntila lowu nga kona;
- Kucinca ndhawu ya khonsetireyitara;
- Kuncinca ka tindhawu ta miako yo hlayisela mati ku katsa madamu yo hlayisa mati ya mpfula; na
- Kucinca ka ku longoloxa switirhisiwa leswi fanaka na mapatu mo fambisa swicelwa na mapatu maleyi ndeni ka mayini na miselo yo fambisa mati mapfula.

Hinkarhi wa tidyondzo leti nga eku endliweni sweswi kuhemeseriwile ehandle swilaveko swa switirhisiwa leswi aswinga katsiwanga eka Mpfumelelo wa Mahlelelo ya Ntshikelelo wa mbango (EIA) lowu endliweke hi lembe ra 2013.

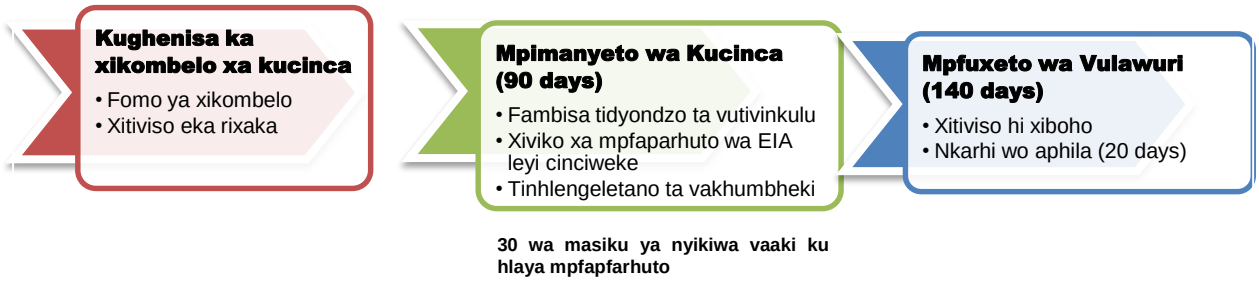
Migingiriko leyi landzelaka yita katsiwa eka purosese ya kucinca:

- Kuhangalasa ka tilayini ta gezi na switichi leswi tsongo swa gezi (<33 kV); na
- Na ku endla kumbe ku kuma gezi hiku tirhisa muchini wa jenerati ya dizele (<10 MW).

Malemukisiwa leswaku migingiriko leyi yongela ayi weli ka xaxameto wamigingiriko leyi hlayiweke hikuya hi swilawana swa Nhlelo wa Ntshikelelo wa Mbango swa 2014. Mingingirikohikwayo leyi hlayiweke laha henhla yi pfumeleriwile hikuya hi swilawana swa Nhlelo wa Ntshikelelo wa Mbango swa 2010 na swona aswi fikeleli mpimo lowunga eka swilawana swa Nhlelo wa Ntshikelelo wa Mbango swa 2014. Hikokwalaho kuta endliwa tsena xikombelo xo cinca ku adiresa kucinca loku kungatava kona ka Phurojeke.

PUROSESE YA XIKOMBELO XA KUCINCA

Purosesenya xikombelo xa kucinca yita endliwa hikuya hi milawu ya Regulation 31 ya EIA (GNR 982) ya Nwendzamhala hi lembe ra 2014 leyi tiyisiweke hikuya hi Nawu wa Rixaka wa Mafambiselo ya Mbango, 1998, (Nawu wa 107 wa 1998) (NEMA) na xiyenge xa 102 hikuya hi Nawu wa Nhluvukiso wa Switirhisiwa swa Swicelwa na Mafurha, 2002 (Nawu wa 28 wa 2002). Ndzawulo ya switirhisiwa swa Timinerali (DMR) hi yona yi tekaka xiboho eka xikombelo xa kucinca na swona hiyona yinga ta teka xiboho xo pfumelela kumbe ku alela Plaatreef ku sungula hikuncinca eka Phurojeke. Kutava na mpfapfarhuto lowu cinciweke wa ta mahlelelo ya Ntshikelelo wa mbango adiresa macincelo eka Phurojeke. Purosese yita famba hindlela leyi kombiweke la hansi.



Tidyondzo ta Vutivinkulu

Kuseketela purosese ya xikombelo xa kucinca, tinwana ta tidyondzo ta vutivinkulu ti ta antswisiwa ku lavisisa ntshikelelo eka mbango na vanhu loko ku ngava kona hikokwalaho ka kucinca ka Phurojeke. Tidyondzo ta vutivinkulu ti katsa ti landzelaka:

- Mahlelelo ya nkoka wa moya
- Mahlelelo ya huwa
- Mahlelelo yo pfala
- Mahlelelo ya thirafiki
- Mahlelelo yaku lughisa no vuyetela evutshanwini
- Ndzhaka na dyondzo ya matimu yavanhu
- Mahlelelo yo vona

Maendlelo yo Nghenisa xandla hi Vaaki

Swiyenge swo khumbeka Phurojekekumbe leswingana ku tsakela eka Phurojeke swa rhambiwa kuti rhijisitara leswaku vata kota ku ghenelela ka mafambiselo lawa. Switiviso swita hiku rhumeliwa hi mapapila,swinavetiso eka maphephahungu,timesegi, switiviso swale sayitini na hi riqingho. Migingiriko ya Maendlelo yo Nghenisa xandla hi Vaaki leyi lanzelaka yilanguterile ku humelela hi ndlela leyi vuriweke la hansi:

- **Xitiviso xa Phurojeke:** Tsalwa leri ra mahungu ya vuyimelo, papilla ra xitiviso leringana fomo yo rijisitara na fomo yo humesa mavonelo, switiviso swale sayitini na switiviso eka media swi humesela hivutalo mahungu ya Phurojeke, kusunguleni ka Nyenyankulu 2016;
- **Ku kumeka ka mpfapfarhuto lowu cinciwke wa EIA:** Mpfapfarhuto lowu cinciweke wa Mahlelelo ya Ntshikelelo wa mbango (EIA) wu tava kona leswaku vanhu va wu langutisa ku sukela hiti 29 Nyenyankulu kufikela ti 28 Dzivamisoko 2016; na
- **Mihlangano ya Vakhumbheki:** Mihlangano ya Vakhumbheki yita khomiwa hi vhiki rati 11 Dzivamisoko 2016.

Ku tiyisisa leswaku u tsarisile tanihi I&AP na ku kuma mahungu lawa ya nga na swilo swintshwa ya phurojeke wa komberiwa ku tata fomo yo rejisitara leyi khomanisiweke. Mavonelo na fomo ya ntsariso swinga rhumeriwa eka hofisi ya vuhlanganisi ya Digby Wells hiku tirhisa leswi tsaliweke laha hansi.

Digby Wells Environmental – Hofisi ya swa Vuhlanganisi

Qondile Monareng Kumbe Nestus Bredenhann
Riq: (011) 789 9495 kumbe Fekisi: 086 583 5715
Emeyili: gondile.monareng@digbywells.com kumbe nestus.bredenhann@digbywells.com

Vuxokoxoko hi xitalo bya Phurojeke bya kumeka ka webisayiti ya Digby Wells *Webisayiti: www.digbywells.com (ehansi ka Public Documents)*

Lavanga ti tsarisela tani hi vakhumbheki kumbe va tsakeli vata tivisiwa hita mpfapfarhuto wa EIA loko wu human a hita mihlangano ya vakhumbeki hiti ndlela leti vanga ti langha (timesegi, emeyili, poso kumbe fekisi). Mavonelo wahi na wahi lawa ya nga ta kumiwa ku suka eka vakhumbheki yata nghenisa xiave eka maendlelo yo teka xiboho hi va nawu na ku nyika mahungu eka ntlawa wa va vutivinkulu lava ngata endla ti dyonzo.

Nomborho ya Phurojeke: IVA3396 4 Nyenyankulu 2016

Ivanplats (Pty) Ltd

Xikombelo Xa Kucinca Xa Platreef, Mugodi Wa Le Hansi Lowu Nga Ekusuhi Na Mokopane Exifundzeninkulu Xa Limpopo.

Mpfumelelo watimhaka ta Mbango: 12/1/9/2-W32, Mpfumelelo wo Cela Mugodi : LP30/5/2/2/1/10067MR

Eka lava khumbhekaka,

Ivanplats (Pty) Ltd. (Ivanplats) yi kunguhanta ku aka no tirhisa Mugodi wale hansi wa Pulatinamu na switirhisiwa leswi fambelanaka na swa mugodi kumbe mayini ekusuhi na Mokopane, exifundzeninkulu xa Limpopo (leyitivekaka hi Phurojeke ya Platreef). Digby wells hi yona yi hundiseke Mahlelelo ya Ntshikelelo wa Mbango na vanhu eka Phurojeke ya Plaatreef hi lembe ra 2013.). Ivanplats yikumile mpfumelelo wo cela mugodi wale hansi (LP30/5/1/2/2/10067MR) na mpfumelelo watimhaka ta mbango (12/1/9/2-W32) swa phurojeke ya Platreef hi lembe ra 2014.

Kusukela loko mpfumelelo wa leswivuriweke laha henhla wuve kona, Ivanplats yi sungurile mingingiriko yo celela no aka shaft1 (shaft leyi nghenisaka moya emugodini), xikanwe na switirhisiwa swa le mugodini leswi katsaka rihlampfu ra ndzilikano wa mugodi, mapatu, tihofisi ta nkarhinyana na tiwekishopo. Ndzilikano lowunga pfumeleriwa wa switirhisiwa swa mugodi wu hungusiwile hikokwalaho ka kumeka wuri ekusuhi swinene na leka Ga-Kgobudi na leka Ga-Kgobudi 2 (Mzombane). Ivanplats yi pfuxetile ndzilikano wa yona lowunga pfumeleriwa wa mugodi ku yita kota kutirha hiku hetiseka eka ndhawu leyi hungusiweke.

Kucinca ka ndzilikano wa mayini swiendle leswaku kuva na xikombelo xo cinca hikuya hi milawu ya Regulation 31 ya EIA (GNR 982) ya Nwendzamhala hi lembe ra 2014 leyi tiyisiweke hikuya hi Nawu wa Rixaka wa Mafambiselo ya Mbango, 1998, (Nawu wa 107 wa 1998) (NEMA) na xiyenge xa 102 hikuya hi Nawu wa Nhluvukiso wa Switirhisiwa swa Swicelwa na Mafurha, 2002 (Nawu wa 28 wa 2002). Ndzawulo ya switirhisiwa swa Timinerali (DMR) hi yona yi tekaka xiboho. Digbywells Environmental (Digby Wells) yi thoriwile hi Ivanplats ku fambisa purosese ya xikombelo xa ku cinca xa Plaatreef.

Nhlamuselo Ya Phurojeke

Phurojeke ya Plaatreef yile emapurasini ya Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS lawa ya welaka ehansi ka Masipala wa muganga wa Mogalakwena eka Masipala wa xifundza xa Waterberg wa xifundzankulu wa Limpopo, kwalomu ka 8 km nwalungu vupeladyambu bya doroba ra Mokopane. Ndhawu ya phurojeke yi fikeleriwa hi ku tirhisa gondzo ra N11. Mintirhi nkulu na switirhisiwa leswi kunguhatiweke ku cinciwa hileswilandzelaka: Ku ta engeteliwa kuleha ka vuaki bya timhandzhe na swidloko, ku ta katsiwa ndhawu yo sila ndhundhuma ya thyaka, ku cinciwa ka ku leha ka anama ka ndhawu yo vekela swicelwa , ku cinca ka ndlela yo fambisa payiphi leyi yiyaka ndhawini yo hlayisa thyaka , ku cinca ka tindhawu to hlayisela mati ku katsa madamu yo hlayisela ku katsa damu ro hlayisa mati ya mpfula, swindledyana swo fambisa mati ya mpfula, kuhangalasa tilayini ta gezi na switichi swa gezi na ku katsiwa ka michini ya jhenerata ya dizele.

Kukumeka ka Mpfapfarhutu leyi cinciweke

Mpfapfarhuto lowu cinciweke wa Mpfumelelo wa Mahlelelo ya Ntshikelelo wa mbango (EIA) na Nongonoko wa mafambiselo ya mbango (EMP) wu tava kona leswaku vanhu va wu langutisa ku sukela hiti 29 Nyenyankulu kufikela ti 28 Dzivamisoko 2016 eka ti ndhawu leti hlayiweke la hansi.

Vito	Ndhawu	Vutihlanganisi
Rifilwe Madisa	Mogalakwena Public Library, corner Van Riebeeck and Pretorius Streets	(015) 491 9729
Lucy Mashetisho	Mahwelereng Public Library, Mahwelereng Village	078 628 3326
Qondile Monareng	www.digbywells.com (under Public Documents) or phone for CD copy	(011) 789 9495
Ivanplats SED Department	7 Second Street, Old Industrial Area, Mokopane or Ivanplats mobile SED unit	(015) 491 0600

Xirhambo eka ti hlengeletano ta vaaka tiko

Mihlangano ya vaaka tiko yita khomiwa ku hlela timhaka ta ku cinca eka mpfapfarhuto wa mahlelelo ya ntshikelelo wa mbangu (EIA) na nongonoko wa mafambiselo ya mbango (EMP) na ku kuma mavonelo ya swiyenge leswi nga na kutsekela kumbe ku khumbheka hi phurojheke hi masiku lawa landzelaka.

Siku	Nkarhi	Ndhawu
13 Dzivamisoko 2016	13:00 – 18:00	Magongoa Village, Open Fields, Marquee Tent
13 Dzivamisoko 2016	13:00 – 18:00	Tshamahansi Village, Open Fields, Marquee Tent

Ndlela yo humesa mavonelo

Marhambiwa humesa mavonelo yanwina himayelana na purosese ya kucinciwa ka phurojeke ya Plaatreef hiku rhumela mavonelo, swisolo na mianakanyo yanwina eka Digby Wells hi yinwe ya tindlela leti tsaliweke laha ehansi:

- Hiku tata fomo yoti rhijisitara na fomo ya mavonelo ivi mi swiyisa ka hofisi ya vaswa vuhlangani;
- Hiku ya eka mihlangano ya vaaka ti no nyika mavonelo kona;
- Hiku tsala papila kumbe;
- Hiku tsala imeyili, fekisi kumbe ku bela riqingho eka va hofisi ya vuhlanganisi.

Loko mirina kunavela kuti tsarisa tani hi mutsakeri kumbe mukhumbeki na ku kuma mahungu kumbe kuhumesa mavonelo mayelana na Phurojeke, tihlanganiseni na Qondile Monareng eka Riq: (011) 789 9495, Fekisi: 086 583 5715, Kherefu ya Poso: Private Bag X10046, Randburg, 2125 or emeyili: qondile.monareng@digbywells.com kumbe nestus.bredenhann@digbywells.com.

Inkomu,



Qondile Monareng

Stakeholder Engagement Office

Leswinga ka tsala leri

- *Matimu Ya Tsalwa Ra Marhungula*
- *Fomo yo Rhijisitara na Fomo yo Humesela Mavonelo*

DIGBY WELLS
ENVIRONMENTAL

IVANPLATS (Pty) Ltd

Xikombelo Xa Kucinca Xa Platreef, Mugodi Wa Le Hansi Lowu Nga Ekusuhi Na Mokopane Exifundzeninkulu Xa Limpopo.

Mpfumelelo watimhaka ta Mbango: 12/1/9/2-W32, Mpfumelelo wo Cela Mugodi : LP30/5/2/2/1/10067MR

FOMO YO RHIJISITARA NA MAVONELO

Nyenyankulu 2016

Lavanga ti tsarisela tani hi vakhumbheki kumbe vatsakeli vata tivisiwa hita leswinga tava swiri karhi swi humelela hiti ndlela leti vati langha (timesegi, emeyili, poso kumbe fekisi). Vanhu va kombelriwa ku ti tsarisa tani hi I&AP na ku nyika mavonelo hiku rhumela fomo leyi kumbe hi ku rhumela aka adirese leyinga laha hansi.

Qondile Monareng eka hofisi ya vuhlanganisi ya Digby Wells Environmental:
Fekisi: 0865835715, **Riq:** (011) 789 9495, **Kherefu ya Poso:** Private Bag X10046, Randburg, 2125
Emeyili: qondile.monareng@digbywells.com, nestus.bredenhann@digbywells.com

Ni kombela ku tsarisiwa tani hi mukhumbheki kume mutsakeri (I&AP)	Ina		Hayi	
Ni ta tsakela ku kuma marhungula hi	Emeyeli	Mesegi	Poso	Fekisi

Mikombeliwa ku kombisa ntlawa lowu miwu yimela na vito ra wona

Ndzawulo ya fumu	
Masipala	
Muaka toko	
Ndzawo yoka yingari ya fumu	
vamabindzu	

Loko miri nwinyi wa mapurasi kumbe ku tshama mapurasini makombeliwa kutsa vito na nomboro ya purasi eri mitshamaka ka rona

Nwinyi wa purasi	
Mutshami wale Purasini	

Makomberiwa kutata vuxokoxoko bya vutihlanganisi la hansi

Mavito					
Xiyimelo					
Riqingho		Fekisi		Riq	
Emeyili					
Kherefu ya Poso					

Swilawana kumbe regulation ya lembe ra 2014 ya Mahlelelo ya Ntshikelelo wa mbango, leyi tiyisisiweke hikuya hi Nawu wa Rixaka wa Mafambiselo ya Mbango, 1998, (Nawu wa 107 wa 1998) (NEMA) na xiyenge xa 44 (1) yi vula leswaku mavonelo ya vaaki ya fanele ya tsariwa hansi. Makombeliwa ku hlamula swivutiso leswi landzelaka. Loko milava ku pfuniwa ku hlamula swivutiso leswi minga endla tano hiku ti hlanganisa n ava hofisi ya vuhlanganisi eka vuxokoxoko lebyi tsaliweke la henhla.

Xana miehleketa leswaku phurojeke yinga mi khumbha njhani?
Xana miehleketa leswaku phurojeke yinga mi khumbha njhani himayela na swa rihanyo , vanhu na swa ikhonomi) (xikombiso. Mahanyelo ya nwina, mapurasi, mabindzu na vutshamibya nwina)
Xana ku khumbheka loku kunga lawuliwa kumbe ku paparhutiwa hi ndlela yihi?

Loko miri nwinyi kumbe mutshami wale purasini, xana ndhawu mi yitirha yini enka nkarhi lowu?

Xana kuna swa mbango, vanhu kumbhe swa ndhavuko eka ndhawu ya phurojeke leti minga hitivisaka swona?

Xana swikumeka kwi?

Xana miehleketa leswaku phurojeke yinga mi khumbha njhani himayela na miako leyi minga na yona? (tiyindlu, mapatu)

Loko swiri kona xana swinga lawuriwa, paparhuta kumbe ku lunghisawa njhani?

Mavonelo

Loko u tiva mani na mani loyi a faneleke ku tivisiwa hi phurojeke nyika vuxokoxoko bya wena bya vutihlanaganisi laha hansi..

Xirhangi, Vito ro Sungula		Xirhangi, Vito ro Sungula	
Ntlawa		Ntlawa	
Riqingho		Riqingho	
Emeyili		Emeyili	

Signature ***Siku***

Appendix C3: Proof of Advertisement

DIGBY WELLS
ENVIRONMENTAL

Ivanplats (Pty) Ltd
Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province

Environmental Authorisation Number: 12/1/9/2-W32, Mining Right Number: LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) intends to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (Platreef Project). Ivanplats obtained both the Mining Right (LP30/5/1/2/2/10067MR) and Environmental Authorisation (12/1/9/2-W32) for the Platreef Project in 2014. Ivanplats has since commenced with the sinking and development of Shaft 1 (ventilation intake shaft). Furthermore, mine infrastructure has been established to support the sinking of Shaft 1 (access road, a mine boundary fence and temporary facilities such as workshops and offices). The approved mine infrastructure footprint has been reduced due to the encroachment of the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities which established residential plots in close proximity to the proposed mine infrastructure area. Ivanplats has consequently revised the approved mine layout to ensure an optimum use of the reduced footprint area. This change to the approved mine layout necessitates the requirement for an Amendment Application process to the relevant licences in terms of the Regulation 31 of the EIA Regulations (GN R. 982) of December 2014 promulgated in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended (NEMA) and Section 102 in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). The Department of Mineral Resources (DMR) will be the Competent Authority and Digby Wells Environmental (Digby Wells) has been appointed by Ivanplats as the independent Environmental Assessment Practitioner for the Amendment Application process. Digby Wells Environmental undertook the original Environmental and Social Impact Assessment (ESIA) for the Platreef Project in 2013.

Project Description

The Platreef Project is located on the farms Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS, situated within the Mogalakwena Local Municipality and Waterberg District Municipality in the Limpopo Province, approximately 8 km northwest of the town of Mokopane and can be accessed via the N11 Highway. The key activities and infrastructure that are proposed to be amended include, but are not limited to: the increase in height of the headgear, inclusion of a production shaft, inclusion of waste rock crushers, separation of stockpiles and an amendment to the height and footprint of the stockpiles, route amendment to the tailings storage facility pipeline, repositioning of water management structures including the stormwater dam and attenuation dams, a new stormwater drain, distribution powerlines and substations and inclusion of diesel generators.

Public Participation

Stakeholders affected by or interested in the Platreef Project Amendment Process are invited to register as an Interested and Affected Party (I&AP) to become involved in the consultation process. Comments and or questions can be addressed to the Digby Wells Stakeholder Engagement Office using the information as provided below. The Amended Environmental Impact Assessment (EIA) Report and Environmental Management Plan (EMP) will be available to the public from **29 March to 28 April 2016** at the places as indicated below.

Person	Location	Contact
Rifilwe Madisa	Mogalakwena Public Library, corner Van Riebeeck and Pretorius Streets	9015) 491 9729
Lucy Mashetisho	Mahwelereng Public Library, Mahwelereng Village	078 628 3326
Qondile Monareng	www.digbywells.com (under Public Documents) or phone for CD copy	(011) 789 9495
Ivanplats SED Department	7 Second Street, Old Industrial Area, Mokopane or Ivanplats mobile SED unit	(015) 491 0600

Invitation to Public Meetings

Public Meetings will be held to discuss contents of the Amended EIA Report / EMP and to obtain stakeholder comments, as indicated below.

Date	Time	Venue
13 April 2016	13:00 – 18:00	Magongoa Village, Open Fields, Marquee Tent
13 April 2016	13:00 – 18:00	Tshamahansi Village, Open Fields, Marquee Tent

Digby Wells Environmental
Qondile Monareng or Nestus Bredenhann
Tel: (011) 789 9495 Fax:086 583 5715 Postal address: Private Bag X10046, Randburg, 2125
Email: gondile.monareng@digbywells.com or nestus.bredenhann@digbywells.com
www.digbywells.com (under Public Documents) *Project Number: IVA3396*

DIGBY WELLS
ENVIRONMENTAL

Ivanplats (Pty) Ltd

Kgopelo ye e Fetotšwego ya Moepo wa Platinamo wa Ka tlase ga mobu wa Platreef, kgauswi le Mokopane, Profenseng ya Limpopo

Nomoro ya Tumelelo ya Tikologo: 12/1/9/2-W3, Nomoro ya Tokelo ya Moepo: LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) e beakanyetša go hlabolla le go laola moepo wa ka tlase ga mobu le mananeokgoparara ao a amanago le wona , kgauswi le Mokopane, Profenseng ya Limpopo (Protšeke ya Platreef). Ivanplats e hweditše bobedi Tokelo ya Moepo (LP30/5/1/2/2/10067MR) le Tumelelo ya Tikologo (12/1/9/2-W32) bakeng sa Protšeke ya Platreef ka 2014. Go tloga ka nako yeo Ivanplats e thomile ka go rafa goba go hlabolla Šafote ya 1 (šafote ya tsenyomoya). Godimo ga moo, mananeokgoparara a moepo a hlomilwe go thekga go epša ga Šafote ya 1 (phihlelelo ya moepo, legora la mollwane le dinolofatši tša nakwana tša go swana le diwekšopo le dikantoro. Mohlala wa mananeokgoparara a moepo wo o dumeletšwego o fokoditšwe ka baka la gore ditšhaba tša Ga-Kgobudi le Ga-Kgobudi 2 (Mzombane) di ile tša hloma dipoloto tša bodulo kgauwi le tikologo ya mananeokgoparara a moepo wo o šišintšwego. Ka gona Ivanplats e bušeleditše peakanyo ye e dumeletšwego ya moepo go netefatša tšhomišo ye kaone ya mohlala wo o fokoditšwego wa mananeokgoparara Phetogo ye ya peakanyo ye e dumeletšwego ya moepo e ile ya hloka gore go be le dinyakwa tša Tshepedišo ya Kgopelo ye e Fetotšwego go dilaesense tša maleba go ya ka Molawana wa 31 wa melawana ya EIA (GN R. 982) wa Manthole 2014 wo o tsebagaditšwego go ya ka Molao wa Bosetšhaba wa Taolo ya Tikologo wa 1998 (Molao wa 107 wa 1998) bjalo ka ge o fetotšwe (NEMA) le Karolo ya 102 go ya ka Molao wa Tlhabollo ya Methopo ya Diminerale le Petroleamo wa 2002 (Molao wa 28 wa 2002). Kgoro ya Methopo ya Diminerale (DMR) e tla ba Taolo ya Bokgoni go Kgopelo gomme Digby Wells Environmental (Digby Wells) e thwetšwe ke Ivanplats bjalo ka Modiragatši wa go Ikema wa Tshekatsheko ya Tikologo bakeng sa tshepedišo ya Kgopelo ye e fotošwego. Digby Wells Environmental e dirile Tshekatsheko ya Seabe sa Tikologo le Leago ebago ESIA bakeng sa protšeke ya Platreef ka ngwaga wa 2013.

Tlhalošo ya Protšeke

Protšeke ya Platreef e dipolaseng tša Macalacaskop 243 KR, Turfspruit 241 KR le Rietfontein 2 KS gomme e ka gare ga Mmasepala wa Selegae wa Mogalakwena le Mmasepala wa Tikologo wa Waterberg ka Profenseng ya Limpopo. Mešomo ye bohlokwa le mananeokgoparara ao a šišinywago go fetošwa a akaretša eupša a sa kgaoletšwe go: koketšo ya dišireletšahlogo, kakaretšo ya šafote ya tšweletšo, kakaretšo ya didirišwa tša go pšhatla maswika a ditšhila, karoganyo ya mekgobo ya phahlo le phetošo ya tsela ya phaephe ya senolofatši sa bobolokelo, peakanyo lefsa ya dibopego tša taolo ya meetse go akaretšwa le letamo la meetsefula le matamo ao a fokotšegago; peakanyoboelatšhila ya meetsefula ye mpsha , diphaephe le ditiši tša kabo ya mohlagase go akaretšwa le ditšeneraithara tša tisele.

Go kgatha tema ga setšhaba.

Bakgathatema bao ba angwago ke Protšeke goba bao ba nago le kgahlego ya Protšeke ba laletšwa bjalo go ingwadiša bjalo ka Bakgathatema ba go ba le kgahlego le bao ba angwago (I&AP) go kgatha tema tshepedišong ya ditherišano. Ditshwayotshwayo le diforomo tša ngwadišo di ka romelwa Kantorong ya Ditherišano le Baamegi ya Digby Well ka go šomiša tshedimošo ye filwego ka tlase. Pego ya Tshekatsheko ya Seabe sa Tikologo (EIA) le Pegohlangwa ya Leano la Taolo ya Tikologo di tla hwetšagala go setšhaba 29 Hlakola go fihla ka 28 Moranagng l 2016 mafelong a a laeditšwego ka tlase

Motho	Lefelo	Nomoroya boikgokaganyo
Rifilwe Madisa	Bokgobapuku bja Setšhaba bja Mogalakwena, khona ya Mmila wa Van Riebeeck le Pretorius	9015) 491 9729
Lucy Mashetisho	Bokgobapuku bja Setšhaba bja Mahwelereng, Motseng wa Mahwelereng g	078 628 3326
Qondile Monareng	www.digbywells.com (ka tlase ga Ditokumente tša Setšhaba) goba o letše bakeng sa khophi ya CD	(011) 789 9495
Kgoro ya SED ya Ivanplats	7 Mmila wa Second, Old Industrial Area, Mokopane goba Ivanplats *mobile SED unit*	(015) 491 0600

Taletšo ya Dikopano tša Setšhaba

Dikopano tša setšhaba di tla swarwa go ahlaahla diteng tša Pego ya EIA ye e fetotšwego /EMP lego hwetša ditshwayotshwayo, bjalo ka ge go laeditšwe ka tlase.

Letšatšikgwedi	Nako:	Lefelo
13 Moranang 2016	13:00 – 18:00	Motseng wa Magongoa, Lefelong le le bulegilego, Tenteng ya Marquee
13 Moranang 2016	13:00 – 18:00	Motseng wa Tshamahansi, Lefelong leo le bulegilego, Teneteng ya Marquee

Digby Wells Environmental
Qondile Monareng goba Nestus Bredenhann
Mogala: (011) 789 9495 Fekese:086 583 5715 Aterese ya Poso: Private Bag X10046, Randburg, 2125
Imeile: qondile.monareng@digbywells.com goba nestus.bredenhann@digbywells.com
www.digbywells.com (under Public Documents) Nomoro ya Protšeke: IVA3396

DIGBY WELLS
ENVIRONMENTAL

Ivanplats (Pty) Ltd

Xikombelo Xa Kucinca Xa Platreef, Mugodi Wa Le Hansi Lowu Nga Ekusuhi Na Mokopane Exifundzeninkulu Xa Limpopo.

Mpfumelelo watimhaka ta Mbango: 12/1/9/2-W32, Mpfumelelo wo Cela Mugodi : LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) yi tiyimisele ku aka no tirhisa mugodi wale hansi wa Pulatinamu na switirhisiwa leswi fambelanaka na swa mugodi ekusuhi na Mokopane, exifundzeninkulu xa Limpopo (Phurojeke ya Plaatreef). Ivanplats yikumile mpfumelelo wo cela mugodi wale hansi (LP30/5/1/2/2/10067MR) na mpfumelelo watimhaka ta mbango (12/1/9/2-W32) swa phurojeke ya Platreef hi lembe ra 2014. Ivanplats yi sungurile mingingiriko yo celela no aka shaft1 (shaft leyi nghenisaka moya emugodini). Kuyisa emahlweni switirhisiwa swa le mugodini swi kona ku pfuneta hi mintirho yo celela shaft 1, switirhisiwa so njhe hi (mapatu, rihlampfu ra ndzilikano wa mugodi na miako ya nkarhinyana tani hi tiwekixopo na tihofisi). Ndzilikano lowunga pfumeleriwa wa switirhisiwa swa mugodi wu hungusiwile hikokwalaho ka kumeka wuri ekusuhi swinene na leka Ga-Kgobudi na leka Ga-Kgobudi 2 (Mzombane). Ivanplats yi pfuxetile ndzilikano wa yona lowunga pfumeleriwa wa mugodi ku yita kota kutirha hiku hetiseka eka ndhawu leyi hungusiweke. Kucinca ka ndzilikano wa mayini swiendle leswaku kuva na xikombelo xo cinca hikuya hi milawu ya Regulation 31 ya EIA (GNR 982) ya Nwendzamhala hi lembe ra 2014 leyi tiyisiweke hikuya hi Nawu wa Rixaka wa Mafambiselo ya Mbango, 1998, (Nawu wa 107 wa 1998) (NEMA) na xiyenge xa 102 hikuya hi Nawu wa Nhluvukiso wa Switirhisiwa swa Swicelwa na Mafurha, 2002 (Nawu wa 28 wa 2002). Ndzawulo ya switirhisiwa swa Timinerali (DMR) hi yona yi tekaka xiboho. Digbywells Environmental (Digby Wells) yi thoriwile hi Ivanplats ku fambisa purosese ya xikombelo xa ku cinca xa Plaatreef. Digby wells hi yona yi hundiseke Mahlelelo ya Ntshikelelo wa Mbango na vanhu eka Phurojeke ya Plaatreef hi lembe ra 2013.

Nhlamuselo Ya Phurojeke

Phurojeke ya Plaatreef yile emapurasini ya Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS lawa ya welaka ehansi ka Masipala wa muganga wa Mogalakwena eka Masipala wa xifundza xa Waterberg wa xifundzankulu wa Limpopo, kwalomu ka 8 km nwalungu vupeladyambu bya doroba ra Mokopane. Ndhawu ya phurojeke yi fikeleriwa hi ku tirhisa gondzo ra N11. Mintirhi nkulu na switirhisiwa leswi kunguhatiweke ku cinciwa hileswilandzelaka: Ku ta engeteliwa kuleha ka vuaki bya timhandzhe na swidloko, ku ta katsiwa ndhawu yo sila ndhundhuma ya thyaka, ku cinciwa ka ku leha ka anama ka ndhawu yo vekela swicelwa , ku cinca ka ndlela yo fambisa payiphi leyi yiyaka ndhawini yo hlayisa thyaka , ku cinca ka tindhawu to hlayisela mati ku katsa madamu yo hlayisela ku katsa damu ro hlayisa mati ya mpfula, swindledyana swo fambisa mati ya mpfula, kuhangalasa tilayini ta gezi na switichi swa gezi na ku katsiwa ka michini ya jhenerata ya dizele.

Ku ghenisa xandla hi vanhu

Swiyenge swo tsakela no khumbeka hi ku cinca ka maendlelelo ya phurojeke ya Plaatreef swa rhambiwa kuti rhijisitara leswaku vata kota ku ghenelela ka mafambiselo lawa. Mavonelo na swivutiso swinga rhumeliwa eka hofisi ya Digby Wells hiku tirhisa leswi tsaliweke la hansi. Mpfapfarhuto lowu cinciweke wa Mpfumelelo wa Mahlelelo ya Ntshikelelo wa mbango (EIA) na Nongonoko wa mafambiselo ya mbango (EMP) wa xikopu wu tava kona leswaku vanhu va wu langutisa ku sukela hiti **29 Nyenyankulu kufikela ti 28 Dzivamisoko 2016** eka ti ndhawu leti hlayiweke la hansi.

Vito	Ndhawu	Vutihlanganisi
Rifilwe Madisa	Mogalakwena Public Library, corner Van Riebeeck and Pretorius Streets	9015) 491 9729
Lucy Mashetisho	Mahwelereng Public Library, Mahwelereng Village	078 628 3326
Qondile Monareng	www.digbywells.com (under Public Documents) or phone for CD copy	(011) 789 9495
Ivanplats SED Department	7 Second Street, Old Industrial Area, Mokopane or Ivanplats mobile SED unit	(015) 491 0600

Xirhambo eka ti hlengeletano ta vaaka tiko

Mihlangano ya vaaka tiko yita khomiwa ku hlela timhaka ta ku cinca eka mpfapfarhuto wa mahlelelo ya ntshikelelo wa mbangu (EIA) na nongonoko wa mafambiselo ya mbango (EMP) na ku kuma mavonelo ya swiyenge leswi nga na kutsekela kumbe ku khumbheka hi phurojheke hi masiku lawa landzelaka.

Siku	Nkarhi	Ndhawu
13 Dzivamisoko 2016	13:00 – 18:00	Magongoa Village, Open Fields, Marquee Tent
13 Dzivamisoko 2016	13:00 – 18:00	Tshamahansi Village, Open Fields, Marquee Tent

Digby Wells Environmental

Qondile Monareng kumbe Nestus Bredenhann

Riq: (011) 789 9495 Fekisi:086 583 5715 Kherefu ya poso: Private Bag X10046, Randburg, 2125

Email: qondile.monareng@digbywells.com kumbe nestus.bredenhann@digbywells.com

www.digbywells.com (ehansi ka Public Documents) *Nomboro ya Phurojeke: IVA3396*

Vendaboy helps citizens embrace their diversity

Maseo Nethanani

LUTENDO Evens Mugagadeli, also known as *Vendaboy Poet,* hails from Nthabalala Ha-Manyima outside Makhado and he is making waves in the poetry industry.

He developed a love for poetry through his aversion to nepotism, hate, and discrimination. These are the factors that established his thoughts of unity and peace among different cultures.

Vendaboy recently signed a recording deal with Manyisa Records, a recording label based in Gauteng.

He has already released three albums and one single, *Maano, Rrrrrrr single, Rrrrrr nga mikosi,* and *Phathutshedzo.*

The 26-year-old recites his poetry in six different languages which are, Sepedi, Tshivenda, Tsonga, Isizulu IsiXhosa and English. He is a performer, an entertainer and an emotional poet who brings his audience to laughter or tears.

Vendaboy works at Charlotte Maxeke Academic Hospital as a human resources management intern.

"I opened a poetry session at the college in February with the aim of sharing my talent with other students and also to embrace poetry and culture and help the diversity of South Africa to grow and leave behind a legacy for our grandchildren. I have performed at events like the Fresher's Ball, held at the college annually since 2013."

Vendaboy has many achievements under his belt which include Best Poet Mapungubwe Festival, Best Community Poet in Molemole, Best Poet Limpopo, SATMA nominations for Best Poet, Best Praise Singer and Most Downloaded Song, Tshivenda Music Awards (TSHIMA) TSHIMA award winner for Best Praise Singer, and Best Judge June 16 Celebration Cosmo City Community (poetry and drama).

"I am proud to have recited a poem to praise the legendary Nelson Mandela which was aired on Phalaphala FM (Tshiko tsha mafhungo). I also recited the poem of heritage on Heritage Day in 2014/2015 which was aired on Metro FM and Phalaphala FM. I also recited poems for the living legend, Mukodeleli Candy Moloi, which was televised on SABC 2 (Ba kae), King of Venda Tony Mphephu Ramabulana which was televised on the well-known soapie, *Muvhango* on SABC 2, and a poem about African unity which was televised on SABC 2 (Zwamaramani), and a poem for Chief Joe Matsila Masia which featured Iren Mawela," he said.



Vendaboy Poet is making waves in the poetry industry.

editor@nmgroup.co.za

Seloba shares Marula Fest fun

Nyambeni Mandiwana

THE immaculate town of Phalaborwa was alive with revellers who convened to the town for the annual Marula Festival which ran over two weeks from 19 to 28 February.

Provincial Government Spokesperson, Phuti Seloba, said the festivities kicked into full swing with a pre-party by Capricorn FM, the festival media partners, at S-Lounge in Namakgale where visitors were treated to a full township experience and entertainment by local deejays like Complexion, Daniel Terras, and Maxwell.

Seloba said the Marula Festival Half Marathon attracted more than 400 runners eager to compete in the 21 km half marathon or the 10 km and 5 km fun run. MEC for the Department of Sport, Art and Culture, Thandi Ndalane and Limpopo Tourism Agency (LTA) CEO, Ndumiso Matlala, were among the dignitaries who participated in the races.

"The Jazz and Gospel Open-Air Concert was the main attraction and saw the Impala Park Stadium filled to capacity. The concert saw live entertainment from the likes of Lira, Zonke, Tshepo Tshola, Judith Sephuma, Sfiso Ncwane, Dr. Thomas Chauke, Malatjie, Khuthane, Magilo, Foster and Zozo light up the stage. On the 19th revellers were treated to performances from various cultural groups from the five districts followed by the SANDF brass band, stick walkers, mascots, drum majorettes and bikers for the street parade. The convoy ended at the Impala Park Stadium for the official opening of the festival by the Mayor of Ba-Phalaborwa Municipality, Anna Sono.

> "The festival continues to attract international delegates annually."
>
> **PHUTI SELOBA, PROVINCIAL GOVT SPOKESPERSON**

The following day until the morning of 21 February saw the Youth Open-Air Concert which featured artists like Cassper Nyovest, Ricky Rick, AKA, Heavy K, Durban Nyts, Nathi, Mmatema (SA Idols finalist, season 11), Oskido, Karabo (SA Idols winner, season 11), Ab Crazy, Ms Cosmo, Kaleido, Zinhle, Professor, Eddie Crook, Deeper Bus, Thallix, Blinks, X Man, Fiona, Master Pule and many more," Seloba said. "Over the years the festival has identified various activities which appeal to the diverse market, we have a few sporting activities to ensure social cohesion, healthy living and to create economic activities. Other activities included leading chefs creating dishes using the marula fruit, the Limpopo Marula Career Expo, Limpopo Marula Educators Seminar and a fun-fair. The festival continues to attract a contingent of international delegates annually, this year we hosted dignitaries from Mozambique, Namibia, Cuba, Venezuela and Zimbabwe. The international media also covered the festival and it was broadcasted in countries like Cuba and Latin America.

"Like the previous festival the 13 cooperatives under Mukumbi Industries brewed 12 000 litres of marula beverage and more than 14 000 people attended both open-air concerts. We continue to value the input of the public and their feedback, they can continue to do so on Facebook: The Annual Marula Festival, Twitter: @MarulaFestival and Instagram: marulafestival. The official hashtag is #Marulafest2016," said Seloba.

crime@nmgroup.co.za

Adrenaline rush = freestyle motocross

Moyahabo Mabeba

"BONES heal, chicks dig scars, glory is forever" is an old credo of the motocross world and it perfectly describes a new breed of bikers who have, literally, taken the sport to greater heights.

It is called freestyle motocross and consists of stupefying combinations of twists, flips, turns and tricks that make regular motocross look like childsplay.

The playground for the dangerously crazy sport comprises a full-blown track with ramps, dongas, dirt and dust.

Some of this "madness" is explained by freestyler, Nkosana Thobana, during a recent interview.

Q: When did you develop a love for bikes?
A: It's an old habit. It started when I was in primary school.



Freestyle motocrosser, Nkosana Thobana's credo is "accelerate, don't hesitate".

Q: How did it happen?
A: I used to watch motocross on TV and later when I was in high school, I started attending motocross events.

Q: Are you a licensed rider?
A: Of course, yes. I am in possession of a Code A1 licence.

Q: Aren't you scared of this madness?
A: This "madness" is what makes me tick.

Q: It looks scary, is it fun?
A: Very fun, indeed, I love it to bits.

Q: How do you perfect this art of riding?
A: It requires a lot of training and dedication.

Q: Aren't you scared that this could break your bones?
A: This is not for the fainthearted. You need to be plucky enough to do this.

Q: Would you let your younger siblings or your children follow in your footsteps?
A: It's a matter of choice. If they like what they see from their brother or father, why deny them the opportunity?

Q: What is the bike you are currently riding?
A: This baby of mine is a Honda 125 cc.

Q: Is this the only bike you have?
A, No! I have a collection, including the Bajaj and Vukaskoeter.

Q: What is your dream bike?
A: There are so many… I just don't know what to pick.

Q: Do you sometimes do public demonstrations?
A: Yes, but not often.

Q: Between cars and bikes, which ones do you find convenient?
A: Man, it has to be bikes…

Q: Reason being?
A: With a bike, you can manoeuvre any route, but not with a car. The bike also allows you to squeeze through traffic and overtake other vehicles, even on narrow paths.

Q: Are you a speedster?
A: I consider myself an average rider. I encourage safe driving and adherence to road traffic laws all the time.

editor@nmgroup.co.za

IVANPLATS (PTY) LTD

AMENDMENT APPLICATION FOR THE PLATREEF UNDERGROUND PLATINUM MINE, NEAR MOKOPANE, LIMPOPO PROVINCE

Environmental Authorisation Number: 12/1/9/2-W32, Mining Right Number: LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) intends to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (Platreef Project). Ivanplats obtained both the Mining Right (LP30/5/1/2/2/10067MR) and Environmental Authorisation (12/1/9/2-W32) for the Platreef Project in 2014. Ivanplats has since commenced with the sinking and development of Shaft 1 (ventilation intake shaft). Furthermore, mine infrastructure has been established to support the sinking of Shaft 1 (access road, a mine boundary fence and temporary facilities such as workshops and offices). The approved mine infrastructure footprint has been reduced due to the encroachment of the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities which established residential plots in close proximity to the proposed mine infrastructure area. Ivanplats has consequently revised the approved mine layout to ensure an optimum use of the reduced footprint area. This change to the approved mine layout necessitates the requirement for an Amendment Application process to the relevant licences in terms of the Regulation 31 of the EIA Regulations (GN R. 982) of December 2014 promulgated in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended (NEMA) and Section 102 in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). The Department of Mineral Resources (DMR) will be the Competent Authority and Digby Wells Environmental (Digby Wells) has been appointed by Ivanplats as the independent Environmental Assessment Practitioner for the Amendment Application process. Digby Wells Environmental undertook the original Environmental and Social Impact Assessment (ESIA) for the Platreef Project in 2013.

Project Description: The Platreef Project is located on the farms Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS, situated within the Mogalakwena Local Municipality and Waterberg District Municipality in the Limpopo Province, approximately 8 km northwest of the town of Mokopane and can be accessed via the N11 Highway. The key activities and infrastructure that are proposed to be amended include, but are not limited to: the increase in height of the headgear, inclusion of a production shaft, inclusion of waste rock crushers, separation of stockpiles and an amendment to the height and footprint of the stockpiles, route amendment to the tailings storage facility pipeline, repositioning of water management structures including the stormwater dam and attenuation dams, a new stormwater drain, distribution powerlines and substations and inclusion of diesel generators.

Public Participation: Stakeholders affected by or interested in the Platreef Project Amendment Process are invited to register as an Interested and Affected Party (I&AP) to become involved in the consultation process. Comments and/or questions can be addressed to the Digby Wells Stakeholder Engagement Office using the information as provided below. The Amended Environmental Impact Assessment (EIA) Report and Environmental Management Plan (EMP) Draft Scoping Report will be available to the public from **29 March to 28 April 2016** at the places as indicated below.

Person	Location	Contact
Rifilwe Madisa	Mogalakwena Public Library, corner Van Riebeeck and Pretorius Streets	(015) 491 9729
Lucy Mashetisho	Mahwelereng Public Library, Mahwelereng Village	078 628 3326
Qondile Monareng	www.digbywells.com (under Public Documents) or phone for CD copy	(011) 789 9495
Ivanplats SED Department	7 Second Street, Old Industrial Area, Mokopane or Ivanplats mobile SED unit	(015) 491 0600

Invitation to Public Meetings: Public Meetings will be held to discuss contents of the Amended EIA Report / EMP and to obtain stakeholder comments, as indicated below.

Date	Time	Venue
13 April 2016	13:00 – 18:00	Magongoa Village, Open Fields, Marquee Tent
13 April 2016	13:00 – 18:00	Tshamahansi Village, Open Fields, Marquee Tent

DIGBY WELLS ENVIRONMENTAL

Digby Wells Environmental
Qondile Monareng or Nestus Bredenhann
Tel: (011) 789 9495 Fax:086 583 5715 Postal address: Private Bag X10046, Randburg, 2125. Email: **qondile.monareng@digbywells.com** or **nestus.bredenhann@digbywells.com**
www.digbywells.com (under Public Documents)

Project Number: IVA3396

Athletes a force to be reckoned with

THE athletes of six private Christian School showed off their skills on Saturday at Hoërskool Piet Potgieter's sports-field during Mokopane Destiny Academy's (MDA) athletics meeting.

The schools that took part were Carpe Diem and MDA from Mokopane, Taba ye Botse from Mookgophong, Divine Kingdom Academy from Venda, Hadashah Learning Centre from Polokwane and Destiny Academy Gateway from Ermelo.

Learners from Gr 1 through to Gr 12 took part in this enjoyable event which took place for the second year in a row and which promises to become an annual event to look forward to in Mokopane.

MDA thanks all the parents, sponsors and friends who made this day possible.



Martin Brits in action. Photos: Supplied



The athletes of MDA are ready for a day of action and fun.





Elandré Janse van Rensburg from MDA is a star in the discus.

The athletes of MDA and Divine Kingdom rush to the finish line in the 200 m sprint.

IVANPLATS (PTY) LTD

AMENDMENT APPLICATION FOR THE PLATREEF UNDERGROUND PLATINUM MINE, NEAR MOKOPANE, LIMPOPO PROVINCE

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DIGBY WELLS ENVIRONMENTAL

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Qondile Monareng or Nestus Bredenhann
Tel: (011) 789 9495 Fax:086 583 5715 Postal address: Private Bag X10046, Randburg, 2125. Email: **qondile.monareng@digbywells.com** or **nestus.bredenhann@digbywells.com**
www.digbywells.com (under Public Documents)

Project Number: IVA3396



Waterberg's netball stars ready for trials

These netball stars of the Waterberg High School showed off their skills last Wednesday during the Potgietersrus Circuit trials and they tested their mettle during the Mahwelereng Circuit trials. See next week's issue of **Bosveld** to see who were chosen to compete in the next round of the trials.

LETLAKALA LA BATHO



Ditšhila toropong ya Mokopane



Karolo ya badudi ba Mountainview, Mokopane, bao ba rego ba nyaka meetse

CAPRICORN DISTRICT MUNICIPALITY

PO Box 4100
POLOKWANE
41 Biccard Street
0700

Tel: 015 294 1000
Fax: 015 295 4010
Email: info@cdm.org.za
Website: www.cdm.org.za

PUBLIC NOTICE

2016/17-2020/21 DRAFT IDP/BUDGET AND PUBLIC CONSULTATIONS

Notice is hereby given in terms of Section 25 of the Municipal Systems Act (Act 32 of 2000) and Section 22 of the Local Government Municipal Finance Management Act (Act 56 of 2003) that Capricorn District Municipality has approved its draft 2016/17-2020/21 IDP/ Budget at its Council meeting held on **Monday, 29 February 2016** at 13h00 at the Capricorn District Municipality Council Chamber.

The Draft IDP/ Budget is available for inspection at the following CDM offices: 41 Biccard Street, Local Municipalities (Aganang, Blouberg, Lepelle-Nkumpi, Polokwane and Molemole) and Satellite Offices/Fire Stations during normal office hours (08h00-16h30). The document can also be accessed at Traditional Authorities and Libraries within the district.

Written comments can be submitted to the Acting Municipal Manager, Capricorn District Municipality, 41 Biccard Street, or at 24 Thabo Mbeki Street (Old MTN Building), Polokwane, 0700 **for 21 days from date of this advert.**

PUBLIC CONSULTATIONS

Members of the public are further invited to attend, make inputs, comments and representations at the IDP/Budget Public Consultation Meetings scheduled as follows:

Stakeholder Category	Date	Time	Venue
Sector Departments and Parastatals	14 March 2016	10h00	Polokwane Royal Hotel
Traditional Leaders	16 March 2016	09h00	Protea Hotel LandMark Polokwane
Business and Academic Institutions	17 March 2016	18h00	MJ Gateway
NGO/CBOs	18 March 2016	10h00	Bolivia Lodge
3rd IDP Representative Forum	23 March 2016	09h00	Bolivia Lodge

For more information please contact Mashiloane Doris @ 015 294 1070/079 522 8856 or Molea Rebecca @ 015 294 1259 / 082 334 7608.

ACTING MUNICIPAL MANAGER - THUSO NEMUGUMONI

Re Šoma le Setšhaba

Anti-Fraudline 0800 20 50 63 / Disaster Toll free 0800 666 777

CDM1423 LIMCOM 0828024719

IVANPLATS (PTY) LTD
KGOPELO YE E FETOTŠWEGO YA MOEPO WA PLATINAMO WA KA TLASE GA MOBU WA PLATREEF, KGAUSWI LE MOKOPANE, PROFENSENG YA LIMPOPO

Nomoro ya Tumelelo ya Tikologo: 12/1/9/2-W3,
Nomoro ya Tokelo ya Moepo: LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) e beakanyetša go hlabolla le go laola moepo wa ka tlase ga mobu le mananeokgoparara ao a amanago le wona , kgauswi le Mokopane, Profenseng ya Limpopo (Protšeke ya Platreef). Ivanplats e tlwaeditše bobedi Tokelo ya Moepo (LP30/5/1/2/2/10067MR) le Tumelelo ya Tikologo (12/1/9/2-W32) bakeng sa Protšeke ya Platreef ka 2014. Go tloga ka nako yeo Ivanplats e thomile ka go rata goba go hlabolla Šafote ya 1 (šafote ya tsenyomoya). Godimo ga moo, mananeokgoparara a moepo a hlomilwe go thekga go epša ga Šafote ya 1 (phihlelelo ya moepo, legora la moilwane le dinokofatši tša nakwana tša go swana le diwekšopo le dikantoro. Mohlala wa mananeokgoparara a moepo wo o dumeletšwego o fokoditšwe ka baka la gore ditšhaba tša Ga-Kgobudi le Ga-Kgobudi 2 (Mzombane) di ile tša hloma dipoloto tša bodulo kgauwi le tikologo ya mananeokgoparara a moepo wo o šišintšwego. Ka gona Ivanplats e bušeleditše peakanyo ye e dumeletšwego ya moepo go netefatša tshomišo ye kaone ya mohlala wo o fokoditšwego wa mananeokgoparara Phetogo ye ya peakanyo ye e dumeletšwego ya moepo e lle ya hloka gore go be le dinyakwa tša Tshepedišo ya Kgopelo ye e Fetotšwego go dilaesense tša maleba go ya ka Molawana wa 31 wa melawana ya EIA (GN R. 982) wa Manthole 2014 wo o tsebagaditšwego go ya ka Molao wa Bosetšhaba wa Taolo ya Tikologo wa 1998 (Molao wa 107 wa 1998) bjalo ka ge o fetotšwe (NEMA) le Karolo ya 102 go ya ka Molao wa Tlhabollo ya Methopo ya Diminerale le Petroleamo wa 2002 (Molao wa 28 wa 2002). Kgoro ya Methopo ya Diminerale (DMR) e tla ba Taolo ya Bokgoni go Kgopelo gomme Digby Wells Environmental (Digby Wells) e tlwetšwe ke Ivanplats bjalo ka Modiragatši wa go ikema wa Tshekatsheko ya Tikologo bakeng sa tshepedišo ya Kgopelo ye e fetotšwego. Digby Wells Environmental e dirile Tshekatsheko ya Seabe sa Tikologo le Leago ebago ESIA bakeng sa protšeke ya Platreef ka ngwaga wa 2013.

Tlhalošo ya Protšeke: Protšeke ya Platreef e dipolaseng tša Macalacaskop 243 KR, Turfspruit 241 KR le Rietfontein 2 KS gomme e ka gare ga Mmasepala wa Selegae wa Mogalakwena le Mmasepala wa Tikologo wa Waterberg ka Profenseng ya Limpopo. Mešomo ye bohlokwa le mananeokgoparara ao a šišinywago go fetošwa a akaretša eupša a sa kgaoletšwe go: koketšo ya dišireletšahlogo, kakaretšo ya šafote ya tšweletšo, kakaretšo ya didirišwa tša go pšhatla maswika a ditšhila, karoganyo ya mekgobo ya phahlo le phetolo ya tsela ya phaephe ya senclofatši sa bobolokelo, peakanyo lefsa ya dibopego tša taolo ya meetse go akaretšwa le letamo la meetsefula le matamo ao a fokotšegago; peakanyoboelatšhila ya meetsefula ye mpsha , diphaephe le ditiši tša kabo ya mohlagase go akaretšwa le dišenaralthara tša tisele.

Go kgatha tema ga setšhaba: Bakgathatema bao ba angwago ke Protšeke goba bao ba nago le kgahlego ya Protšeke ba laletšwa bjalo go ingwadiša bjalo ka Bakgathatema ba go ba le kgahlego le bao ba angwago (I&AP) go kgatha tema tshepedišong ya ditherišano. Ditshwayotshwayo le diforomo tša ngwadišo di ka romelwa Kantorong ya Ditherišano le Baamegi ya Digby Well ka go šomiša tshedimošo ye fiwego ka tlase. Pega ya Tshekatsheko ya Seabe sa Tikologo (EIA) le Pegohlangwa ya Leano la Taolo ya Tikologo di tla hwetšagala go setšhaba 29 Hlakola go fihla ka 28 Moranagng / 2016 mafelong a a laeditšwego ka tlase

Motho	Lefelo	Nomoroya boikgokaganyo
Riflwe Madisa	Bokgobapuku bja Setšhaba bja Mogalakwena, khona ya Mmila wa Van Riebeeck le Pretorius	(015) 491 9729
Lucy Mashetisho	Bokgobapuku bja Setšhaba bja Mahwelereng, Motseng wa Mahwelereng g	078 628 3326
Qondile Monareng	www.digbywells.com (ka tlase ga Ditokumente tša Setšhaba) goba o letše bakeng sa khophi ya CD	(011) 789 9495
Kgoro ya SED ya Ivanplats	7 Mmila wa Second, Old Industrial Area, Mokopane goba Ivanplats mobile SED unit	(015) 491 0600

Taletšo ya Dikopano tša Setšhaba: Dikopano tša setšhaba di tla swarwa go ahlaahla diteng tša Pego ya EIA ye e fetotšwego /EMP lego hwetša ditshwayotshwayo, bjalo ka ge go laeditšwe ka tlase.

Letšatšikgwedi	Nako:	Lefelo
13 Moranang 2016	13:00 – 18:00	Motseng wa Magongoa, Lefelong le le bulegilego, Tenteng ya Marquee
13 Moranang 2016	13:00 – 18:00	Motseng wa Tshamahansi, Lefelong leo le bulegilego, Teneteng ya Marquee

Digby Wells Environmental
Qondile Monareng goba Nestus Bredenhann
Mogala: (011) 789 9495 Fekese: 086 583 5715 Aterese ya Poso: Private Bag X10046, Randburg, 2125
Imelle: **qondile.monareng@digbywells.com goba nestus.bredenhann@digbywells.com**
www.digbywells.com (under Public Documents)

DIGBY WELLS ENVIRONMENTAL

IVANPLATS (PTY) LTD
XIKOMBELO XA KUCINCA XA PLATREEF, MUGODI WA LE HANSI LOWU NGA EKUSUHI NA MOKOPANE EXIFUNDZENINKULU XA LIMPOPO

Mpfumelelo watimhaka ta Mbango: 12/1/9/2-W32,
Mpfumelelo wo Cela Mugodi : LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) yi tiyimisele ku aka no tirhisa mugodi wale hansi wa Pulatinamu na switirhisiwa leswi tambelanaka na swa mugodi ekusuhi na Mokopane, exifundzeninkulu xa Limpopo (Phurojeke ya Plaatreef). Ivanplats yikumile mpfumelelo wo cela mugodi wale hansi (LP30/5/1/2/2/10067MR) na mpfumelelo watimhaka ta mbango (12/1/9/2-W32) swa phurojeke ya Platreef hi lembe ra 2014. Ivanplats yi sungurile mingingiriko yo celela no aka shafi1 (shaft leyi nghenisaka moya emugodini). Kuyisa emahlweni switirhisiwa swa le mugodini swi kona ku pfuneta hi mintirho yo celela shaft 1, switirhisiwa so nghe hi (mapatu, rihlampfu ra ndzilikano wa mugodi na miako ya nkarhinyana tani hi tiwekixopo na tihofsi). Ndzilikano lowunga pfumeleriwa wa switirhisiwa swa mugodi wu hungusiwile hikokwalaho ka kumeka wuri ekusuhi swinene na leka Ga-Kgobudi na leka Ga-Kgobudi 2 (Mzombane). Ivanplats yi pfuxetile ndzilikano wa yona lowunga pfumeleriwa wa mugodi ku yita kota kutirha hiku hetiseka eka ndhawu leyi hungusiweke. Kucinca ka ndzilikano wa mayini swiendle leswaku kuva na xikombelo xo cinca hikuya hi milawu ya Regulation 31 ya EIA (GNR 982) ya Nwendzamhala hi lembe ra 2014 leyi tiyisiweke hikuya hi Nawu wa Rixaka wa Mafambiselo ya Mbango, 1998, (Nawu wa 107 wa 1998) (NEMA) na xiyenge xa 102 hikuya hi Nawu wa Nhluvukiso wa Switirhisiwa swa Swicelwa na Mafurha, 2002 (Nawu wa 28 wa 2002). Ndzawulo ya switirhisiwa swa Timinerali (DMR) hi yona yi tekaka xiboho. Digbywells Environmental (Digby Wells) yi thonwile hi Ivanplats ku fambisa purosese ya xikombelo xa ku cinca xa Plaatreef. Digby wells hi yona yi hundiseke Mahlelelo ya Ntshikelelo wa Mbango na vanhu eka Phurojeke ya Plaatreef hi lembe ra 2013.

Nhlamuselo Ya Phurojeke: Phurojeke ya Plaatreef yile emapurasini ya Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS lawa ya welaka ehansi ka Masipala wa muganga wa Mogalakwena eka Masipala wa xifundza xa Waterberg wa xifundzankulu wa Limpopo, kwalomu ka 8 km nwalungu vupeladyambu bya doroba ra Mokopane. Ndhawu ya phurojeke yi fkeleriwa hi ku tirhisa gondzo ra N11. Mintirhi nkulu na switirhisiwa leswi kunguhatiweke ku cinciwa hileswilandzelaka: Ku ta engeteliwa kuleha ka vuaki bya timhandzhe na swidloko, ku ta katsiwa ndhawu yo sila ndhundhuma ya thyaka, ku cinciwa ka ku leha ka anama ka ndhawu yo vekela swicelwa , ku cinca ka ndlela yo fambisa payiphi leyi yiyaka ndhawini yo hlayisa thyaka , ku cinca ka tindhawu to hlayisela mati ku katsa madamu yo hlayisela ku katsa damu ro hlayisa mati ya mpfula, swindlediyana swo fambisa mati ya mpfula, kuhangalasa tilayini ta gezi na switichi swa gezi na ku katsiwa ka michini ya jhenerata ya dizele.

Ku ghenisa xandla hi vanhu: Swiyenge swo tsakela no khumbeka hi ku cinca ka maendlelelo ya phurojeke ya Plaatreef swa rhambiwa kuti rhijistara leswaku vata kota ku ghenelela ka mafambiselo lawa. Mavonelo na swivutiso swinga rhumeliwa eka hofsi ya Digby Wells hiku tirhisa leswi tsaliweke la hansi. Mpfapfarhuto lowu cinciweke wa Mpfumelelo wa Mahlelelo ya Ntshikelelo wa mbango (EIA) na Nongonoko wa mafambiselo ya mbango (EMP) wa xikopu wu tava kona leswaku vanhu va wu langutisa ku sukela hiti 29 Nyenyankulu kufkela ti 28 Dzivamisoko 2016 eka ti ndhawu leti hlayiweke la hansi.

Vito	Ndhawu	Vutihlanganisi
Riflwe Madisa	Mogalakwena Public Library, corner Van Riebeeck and Pretorius Streets	(015) 491 9729
Lucy Mashetisho	Mahwelereng Public Library, Mahwelereng Village	078 628 3326
Qondile Monareng	www.digbywells.com (under Public Documents) or phone for CD copy	(011) 789 9495
Ivanplats SED Department	7 Second Street, Old Industrial Area, Mokopane or Ivanplats mobile SED unit	(015) 491 0600

Xirhambo eka ti hlengeletano ta vaaka tiko: Mihlangano ya vaaka tiko yita khomiwa ku hlela timhaka ta ku cinca eka mpfapfarhuto wa mahlelelo ya ntshikelelo wa mbangu (EIA) na nongonoko wa mafambiselo ya mbango (EMP) na ku kuma mavonelo ya swiyenge leswi nga na kutsekela kumbe ku khumbheka hi phurojheke hi masiku lawa landzelaka.

Siku	Nkarhi	Ndhawu
13 Dzivamisoko 2016	13:00 – 18:00	Magongoa Village, Open Fields, Marquee Tent
13 Dzivamisoko 2016	13:00 – 18:00	Tshamahansi Village, Open Fields, Marquee Tent

Digby Wells Environmental
Qondile Monareng kumbe Nestus Bredenhann
Riq: (011) 789 9495 Fekisi:086 583 5715 Kherefu ya poso: Private Bag X10046, Randburg, 2125. Email: **qondile.monareng@digbywells.com** kumbe **nestus.bredenhann@digbywells.com**
www.digbywells.com (ehansi ka Public Documents)

DIGBY WELLS ENVIRONMENTAL



Hlogo ya Sekolo sa Phagameng, Mna Sello Leshabela, Mme Maureen Mogale wa Capitec le Mna Elias Dikgale wa Kgoro ya Temo

BALAODI PUBLISHERS CC

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No. 24A Biccard Street
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Polokwane
Tel: 015 291 12000

DIGBY WELLS
ENVIRONMENTAL

Ivanplats (Pty) Ltd

Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province

Environmental Authorisation Number: 12/1/9/2-W32, Mining Right Number: LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) intends to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province. The approved mine infrastructure footprint has been reduced due to the close proximity of the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities. Ivanplats has consequently revised the approved mine layout to ensure an optimum use of the reduced footprint area. The Environmental Impact Assessment (EIA) Addendum Report is currently available to the public until **28 April 2016** at the Ivanplats SED Department, Ivanplats Mine Entrance (Security Gate) and at the Ivanplats CRA Mobile office.

Public Meetings
As part of the Public Participation process currently underway, and already communicated to stakeholders by means of site notices, adverts and letters, Public Meetings are scheduled to be held as indicated below.

- Wednesday,13 April 2016, 13:00 – 18:00 at Magongoa Village, Open Fields, Marquee Tent
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In addition to the Public Meetings mentioned above, the following additional Public Meetings will be held:

Date	Time	Venue
Sunday, 17 April 2016	12:00 – 15:00	Mzombane, Sekgoboko Kgobudi Public Meeting: Lekwa Sports Ground
Sunday, 17 April 2016	12:00 – 15:00	Masehlaneng, Moshate Maroteng, Masodi Public Meeting: Masodi High Sports Ground
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www.digbywells.com (under Public Documents) *Project Number: IVA3396*

Have your say | Sê jou sê

WITH the second and final registration weekend for the 2016 Municipal Election on 9 and 10 April, **Bosveld** asked some of our readers why they think it is important to vote.

Victor Thobejane



"It's important for us to vote, not only to get rid of corruption but also for effective service delivery."



James Modubu

"It is simple, your vote is your voice. If you don't vote you can't complain, register and vote."

Junior Matlou



"As a community it is our responsibility to choose our leaders so that we can entrust them with our needs and know that they will look after us."



Moira Nesmith

"It is important because it plays a big role in our future. If you do not vote you can't complain and you have to accept the consequences. Your vote can make a difference."

Jolene Moll



"Om jou sê te sê. Jou stem kan 'n verskil maak. Mense kla altyd, maar hulle stem nooit."

REDAKTEUR SE INK

Charmaine Lourens

Trippel M dorpe in 'n wurggreep



In die 2013/14 boekjaar het die Mogalakwena Munisipaliteit spoggerig vir 'n derde agtereenvolgende jaar 'n toekenning ontvang as een van die groenste munisipaliteite in die land met 'n skoon oudit verslag en 'n dorp wat 'n voorstaander van 'n rommelvrye omgewing is.

Die munisipaliteit is nie net gereken as een van die top vyf munisipaliteite in die land wat finansieël volhoubaar is nie, maar ook deur die Departement Ekonomiese Ontwikkeling en Toerisme geprys vir sy groen omgewing. "Ons moet ons omgewing beskerm vir huidige en toekomstige geslagte deur redelike wetgewende en ander maatreëls wat besoedeling en ekologiese agteruitgang verhinder, bewaring bevorder en ekologiese volhoubare ontwikkeling verseker," het Munisipale Bestuurder, William Kekana, toe gesê kort voordat hy in 2015 by die munisipaliteit uitgeskop is.

Vandeesweek is Kekana terug na 'n hofbevel wat gelas dat hy weer aangestel word in sy pos en hy sê breebors hy sien daarna uit dat dienslewering so gou moontlik terugkeer. 'n Paar tree van hom op die hoek van Beitel- en Thabo Mbekirylaan waar die stakende munisipale werkers vanoggend weer onder die bome vergader, word daar vuiste gebal, gesing en vasberade vasgeskop. Daar sal slegs teruggekeer word as daar voldoen word aan die werkers se salaris eise.

Ongeag Kekana se herinstelling gaan die werkers voort met hule staking en daarby is daar diegene by die munisipaliteit wat nie sy terugkeer verwelkom nie. Is hier dan eintlik net nog probleme oppad?

Mokopane se sakelui is keelvol vir betogings, stakings en die munisipaliteit se binnegevegte wat vooruitgang in die dorp se ekonomie kelder. Die dorp groei nie buitentoe nie en vir diegene wat hier wil belê is die prentjie tans nie rooskleurig nie, sê van die sakemanne.

Na verneem word moes die munisipaliteit die afgelope twee weke miljoene rande opdok om buitekontrakteurs te kry om die vullis te verwyder. Dié diens is nou gestaak en Mokopane is 'n vuil dorp, 'n ashoop met stinkende vullis wat oral rondlê en gras wat heuphoogte staan.

Die inwoners is siek en sat om soos dronk bestuurders te koes vir al die dongas in die paaie, Voeg daarby robotte wat nie werk nie en verkeers- en brandweermanne wat iewers by hul huise agteroor sit. Op sosiale media kondig inwoners luidskeels aan hulle betaal nie vir dienste wat nie gelewer word nie en daar is 'n hulpkreet van mense wat hulle rekeninge wil betaal en motorlisensies moet hernu.

Leiers en inwoners in Mahwereleng daag by **Bosveld** se kantore op en verwag ons moet wonderwerke verrig om dienslewering daar aan die gang te kry. In die nedersettings rondom die dorp word bande gebrand uit moedeloosheid vir al die krane sonder water en in ons buurdorpe gaan dit net so beroerd. In Moogophong noop die waterskaarste talle inwoners om 'n te koop bordjie voor hulle huise in te slaan. Is Mookgophong 'n spookdorp in wording?

Die trippel M dorpe in Limpopo, Mokopane, Mookgopong en Modimolle, is voorwaar in 'n wurggreep van wanorde en verwoesting, terwyl die meeste inwoners smag na werkbare oplossings en vooruitgang. Die vraag op almal se lippe is: Wat hou die toekoms in vir die trippel M dorpe?

redakteur.bosvelder@nmgroup.co.za



Stakende werkers van die munisipaliteit sing uit volle bors die volkslied waar hulle daagliks bymekaarkom op Thabo Mbeki- en Beitelstraat.

www.reviewonline.co.za

Die DBV kan by 015 491 3661 gekontak word



Dankie Aan:

• Debtsafe, The Vet Shop, Lonely Oak Hotel, Investec PB vir die maandelikse donasies.

Ons ontvang graag:

• Ou klere • Komberse
• Kos en voer • Speelgoed

Daar is 'n groot hoeveelheid diere wat huise soek, dit sal ons harte baie bly maak as daar persone is wat vir die diere 'n liefdevolle huis kan gee.

IVANPLATS (PTY) LTD

AMENDMENT APPLICATION FOR THE PLATREEF UNDERGROUND PLATINUM MINE, NEAR MOKOPANE, LIMPOPO PROVINCE

Environmental Authorisation Number: 12/1/9/2-W32, Mining Right Number: LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) intends to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province. The approved mine infrastructure footprint has been reduced due to the close proximity of the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities. Ivanplats has consequently revised the approved mine layout to ensure an optimum use of the reduced footprint area. The Environmental Impact Assessment (EIA) Addendum Report is currently available to the public until 28 April 2016 at the Ivanplats SED Department, Ivanplats Mine Entrance (Security Gate) and at the Ivanplats CRA Mobile office.

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Date	Time	Venue
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Sunday, 17 April 2016	09:00 – 11:00	Tshamahansi Public Meeting: Tshamahansi Village

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Email: **qondile.monareng@digbywells.com**
or **nestus.bredenhann@digbywells.com**
www.digbywells.com (under Public Documents)

Project Number: IVA3396

DIGBY WELLS
ENVIRONMENTAL

Ivanplats (Pty) Ltd

Xikombelo Xa Kucinca Xa Platreef, Mugodi Wa Le Hansi Lowu Nga Ekusuhi Na Mokopane Exifundzeninkulu Xa Limpopo.

Mpfumelelo watimhaka ta Mbango: 12/1/9/2-W32, Mpfumelelo wo Cela Mugodi : LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) yi tiyimisele ku aka no tirhisa mugodi wale hansi wa Pulatinamu na switirhisiwa leswi fambelanaka na swa mugodi ekusuhi na Mokopane, exifundzeninkulu xa Limpopo. Ndzilikano lowunga pfumeleriwa wa switirhisiwa swa mugodi wu hungusiwile hikokwalaho ka kumeka wuri ekusuhi swinene na leka Ga-Kgobudi na leka Ga-Kgobudi 2 (Mzombane). Ivanplats yi pfuxetile ndzilikano wa yona lowunga pfumeleriwa wa mugodi ku yita kota kutirha hiku hetiseka eka ndhawu leyi hungusiweke. Mpfapfarhuto lowu cinciweke wa Mpfumelelo wa Mahlelelo ya Ntshikelelo wa mbango (EIA) wa kumeka leswaku vaaka tiko wa wuhlela ku fika siku ra ti 28 Dzivamisoko 2016eka ti hofisi ta Ivanplats SED, eka ghede ya mayini wa Ivanp0lants (ghede ya sekhurithi) na le ka hofisi ya Ivanplats ya CRA.

Mihlengeletano Ya Vaaka Tiko

Tani hi xiyenge xa mingingiriko yaku ghenisa xandla hi vaaka tiko leyi ngele ku humeleleni,naswona leswi swinga tivisiwa vakhumbheki hi tindlela ta switiviso, swinavetiso na mapapila, mihlangano ya vaaka tiko yita khomiwa hi ndlela leyi vuriweke la hansi.

- Ravunharhu,13 Dzivamisoko 2016, 13:00 – 18:00 eka Magongoa Village, endzeni ka tende
- Ravunharhu,13 Dzivamisoko 2016, 13:00 – 18:00 eTshamahansi Village, endzeni ka tende

Kuengetela eka ti hlengeletano ta vaaka tiko leti vuriweka laha hendla,yinwana mihlengeletano yo ngetela ya vaaka tiko yita khomiwa:

Siku	Nkarhi	Ndhawu
Nsoto,17 Dzivamisoko 2016	09:00 – 11:00	Hlengeletano wa vaaka tiko va Mzombane, Sekgoboko Kgobudi wuta khomiwa e girawundini ya swipotso ya Lekwa (Lekwa Sports Ground)
Nsoto,17 Dzivamisoko 2016	09:00 – 11:00	Hlengeletano wa vaaka tiko va Masehlaneng, Moshate Maroteng na Masodi wutava e girawundini ya xikolo xale henhla xa Masodi (Masodi High Sports Ground)
Nsoto,17 Dzivamisoko 2016	09:00 – 11:00	Hlengeletano wa vaaka tiko va Tshamahansi wuta khomiwa etikweni ra Tshamahansi

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www.digbywells.com (ehansi ka Public Documents) *Nomboro ya Phurojeke: IVA3396*

DIGBY WELLS
ENVIRONMENTAL

Kgopelo ye e Fetotšwego ya Moepo wa Platinamo wa Ka tlase ga mobu wa Platreef, kgauswi le Mokopane, Profenseng ya Limpopo

Nomoro ya Tumelelo ya Tikologo: : 12/1/9/2-W32, Nomoro ya Tokelo ya Moepo : LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) baikemiseditše go hlabolla lego laola moepo waka tlase ga mabu le mananeo kamoka ao amanago le wona, kgauswi le naga ya Mokopane, kwa profenseng ya Limpopo. Boleng ba meago ya moepo o odumeletsweng efokoditšwe gobane elekgauswi le motse wa Ga-Kgobudi le Ga-Kgobudi 2(Mzombane). Ivanplats ebile ya lekola boleng ba moepo yo odumeletswego go kgonthišiša gore boleng bofokoditswego bo šomišiwa botše. Pego ya Tshekatsheko ya Seabe sa Tikologo (EIA) ekagwetšagala ko kantorong ya Ivanplats ya lefapa la SED, kgorong ya boitshireletšo ya gokena mo Ivanplats le ko kantorong ya CRA ya Ivanplats gofihlela ka di 28 Moranang 2016.

Dikopano tša Setšhaba
kopano ya setshaba seo se amegago etlilwe gotšeya karolo bjale kage batsebištšwe ka tsela ya go beya ditsebišo, dipapatšo le mangwalo. Dikopano tša šetšhaba di tlilwe goswarwa bjalo ka ge go laeditšwe ka tlase:

- Laboraro,13 Moranang 2016, 13:00 – 18:00 ko Magongoa Village, mo lebaleng, tenteng ya Marquee
- Laboraro, 13 Moranang 2016, 13:00 – 18:00 ko Tshamahansi Village, mo lebaleng, tenteng ya Marquee

Go oketša go di kopano tša ka godimo, gotlilo goba le dikopano tše dilatelago :

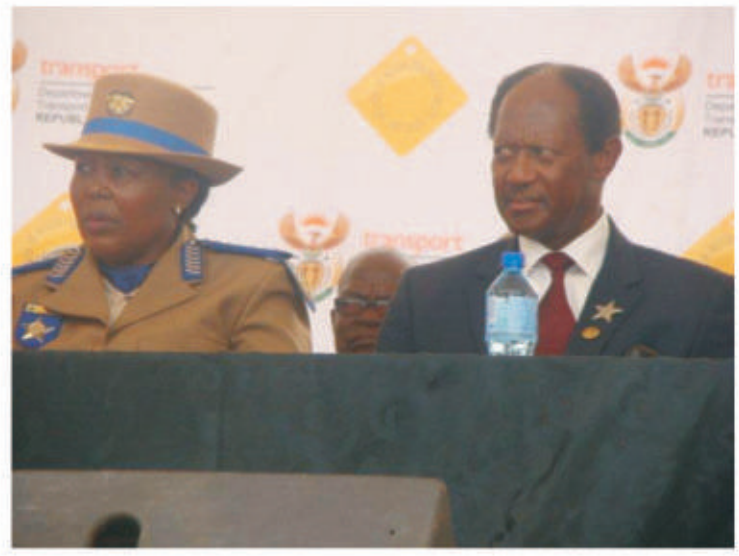
Date	Time	Venue
Lamorena, 17 Moranang 2016	09:00 – 11:00	Mzombane, Sekgoboko Kgobudi kopano ya setšhaba: Lekwa Sports Ground
Lamorena, 17 Moranang 2016	09:00 – 11:00	Masehlaneng, Moshate Maroteng, Masodi kopano ya setšhaba: Masodi High Sports Ground
Lamorena, 17 Moranang 2016	09:00 – 11:00	Tshamahansi kopano ya setšhaba: Tshamahansi Village

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www.digbywells.com (under Public Documents) *Project Number: IVA3396*

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF TRANSPORT

PHETOGO E A KGONEGA! RE A LEBOGA!



MEC Mapula Mokaba-Phukwana nakong ya lesolo la 'Goroga o Phela'.

Nakong ya ge a thakgola lesolo la 'Goroga o Phela' la lenyaga kua Mankweng, MEC Mapula Mokaba-Phukwana, o ile a dira boipiletšo go baotledi le basepelakamaoto go bula mahlo ge ba sepela tseleng nakong ya maikhutšo a Lehu la Morena.

Magareng ga tše dingwe, Molekgotlaphethiši o kgalemile taba ya go otlela motho a nwele bjala, go sepela ka lebelo la godimo, go rwala morwalo o mogolo go feta tekanyo le go sepela ka difatanaga tšeo di sego tša lokela tsela. O ile a lemoša gore bahlankedi ba sephethephethe, ba tla ba ba le gohle le gore ba ka se be le kwelobohloko go bao ba otlelago ka bošaedi. O eleditše basepelakamaoto go apara diaparo tša go taga ge ba sepela tseleng bošego. Gape o eleditše basepelakamaoto go ba kgole le ditsela tša difatanaga ge ba šetše ba kwele madila.

Mo lebakeng le, go itaetša nke mantšu a gagwe a wetše ditsebeng tša go kwa.

Palo ya dinkhu tseleng naga ka bophara e theogile go tloga go 287 ka 2015 go ya go 156 mola Limpopo palo ya dinkhu nakong ya Lehu la Morena e theogile go tloga go 49 ka 2015 go ya go 19 ka 2016. Batho ba ka kgona go fetola boitshwaro bja bona. Se ke bohlatse bja gore phetogo e a kgonega!

Kgoro ya Dinamelwa e leboga bohle, baotledi le basepelakamaoto, ka boitshwaro bja bona ditseleng. Nepo ya Kgoro ke go bona go se na motho le ge e ka ba o tee a hlokofetše ditseleng. Le ge nepo ye e se ya fihlelelwa, Kgoro e leboga kaonafalo yeo e bilego gona.

Kgoro e re: Re a leboga! Le ka moso swarang bjalo!



MEC Mapula Mokaba-Phukwana ge a bolela nakong ya lesolo la 'Goroga o Phela'



Karolo ya lešaba leo le bego le tlile nakong ya lesolo la 'Goroga o Phela' Mankweng



MEC Mapula Mokaba-Phukwana nakong ya ge a goroga Sekolong sa Megoring ka lesolo la 'Goroga o Phela'

IVANPLATS (PTY) LTD

KGOPELO YE E FETOTŠWEGO YA MOEPO WA PLATINAMO WA KA TLASE GA MOBU WA PLATREEF, KGAUSWI LE MOKOPANE, PROFENSENG YA LIMPOPO

Nomoro ya Tumelelo ya Tikologo: 12/1/9/2-W32,
Nomoro ya Tokelo ya Moepo: LP30/5/2/2/1/10067MR

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- Laboraro,13 Moranang 2016, 13:00 – 18:00 ko Magongoa Village, mo lebaleng, tenteng ya Marquee
- Laboraro, 13 Moranang 2016, 13:00 – 18:00 ko Tshamahansi Village, mo lebaleng, tenteng ya Marquee

Go oketša go di kopano tša ka godimo, gotlilo goba le dikopano tše dilatelago:

Date	Time	Venue
Lamorena, 17 Moranang 2016	09:00 – 11:00	Mzombane, Sekgoboko Kgobudi kopano ya setšhaba: Lekwa Sports Ground
Lamorena, 17 Moranang 2016	09:00 – 11:00	Masehlaneng, Moshate Maroteng, Masodi kopano ya setšhaba: Masodi High Sports Ground
Lamorena, 17 Moranang 2016	09:00 – 11:00	Tshamahansi kopano ya setšhaba: Tshamahansi Village

Digby Wells Environmental
Qondile Monareng or Nestus Bredenhann
Tel: (011) 789 9495 Fax: 086 583 5715
Postal address: Private Bag X10046, Randburg, 2125
Email: **qondile.monareng@digbywells.com**
or **nestus.bredenhann@digbywells.com**
www.digbywells.com (under Public Documents)

DIGBY WELLS ENVIRONMENTAL

Project Number: IVA3336

IVANPLATS (PTY) LTD

XIKOMBELO XA KUCINCA XA PLATREEF, MUGODI WA LE HANSI LOWU NGA EKUSUHI NA MOKOPANE EXIFUNDZENINKULU XA LIMPOPO.

Mpfumelelo watimhaka ta Mbango: 12/1/9/2-W32,
Mpfumelelo wo Cela Mugodi: LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) yi tiyimisele ku aka no tirhisa mugodi wale hansi wa Pulatinamu na switirhisiwa leswi fambelanaka na swa mugodi ekusuhi na Mokopane, exifundzeninkulu xa Limpopo. Ndzilikano lowunga pfumeleriwa wa switirhisiwa swa mugodi wu hungusiwile hikokwalaho ka kumeka wuri ekusuhi swinene na leka Ga-Kgobudi na leka Ga-Kgobudi 2 (Mzombane). Ivanplats yi pfuxetile ndzilikano wa yona lowunga pfumeleriwa wa mugodi ku yita kota kutirha hiku hetiseka eka ndhawu leyi hungusiweke. Mpfapfarhuto lowu cinciweke wa Mpfumelelo wa Mahlelelo ya Ntshikelelo wa mbango (EIA) wa kumeka leswaku vaaka tiko wa wuhlela ku fka siku ra ti 28 Dzivamisoko 2016eka ti hofsi ta Ivanplats SED, eka ghede ya mayini wa Ivanp0lants (ghede ya sekhurithi) na le ka hofsi ya Ivanplats ya CRA.

Mihlengeletano Ya Vaaka Tiko

Tani hi xiyenge xa mingingiriko yaku ghenisa xandla hi vaaka tiko leyi ngele ku humeleleni,naswona leswi swinga tivisiwa vakhumbheki hi tindlela ta switiviso, swinavetiso na mapapila, mihlangano ya vaaka tiko yita khomiwa hi ndlela leyi vuriweke la hansi.

- Ravunharhu,13 Dzivamisoko 2016, 13:00 – 18:00 eka Magongoa Village, endzeni ka tende
- Ravunharhu,13 Dzivamisoko 2016, 13:00 – 18:00 eTshamahansi Village, endzeni ka tende

Kuengetela eka ti hlengeletano ta vaaka tiko leti vuriweka laha hendla,yinwana mihlengeletano yo ngetela ya vaaka tiko yita khomiwa:

Siku	Nkarhi	Ndhawu
Nsoto,17 Dzivamisoko 2016	09:00 – 11:00	Hlengeletano wa vaaka tiko va Mzombane, Sekgoboko Kgobudi wuta khomiwa e girawundini ya swipotso ya Lekwa (Lekwa Sports Ground)
Nsoto,17 Dzivamisoko 2016	09:00 – 11:00	Hlengeletano wa vaaka tiko va Masehlaneng, Moshate Maroteng na Masodi wutava e girawundini ya xikolo xale henhla xa Masodi (Masodi High Sports Ground)
Nsoto,17 Dzivamisoko 2016	09:00 – 11:00	Hlengeletano wa vaaka tiko va Tshamahansi wuta khomiwa etikweni ra Tshamahansi

Digby Wells Environmental
Qondile Monareng kumbe Nestus Bredenhann
Riq: (011) 789 9495 Fekisi: 086 583 5715 Kherefu ya poso:
Private Bag X10046, Randburg, 2125
Email: **qondile.monareng@digbywells.com kumbe**
nestus.bredenhann@digbywells.com
www.digbywells.com (ehansi ka Public Documents)

DIGBY WELLS ENVIRONMENTAL

Nomboro ya Phurojeke: IVA3336

Appendix C4: Proof of Site Notice, Site Notice Report and Site Notice Map

DIGBY WELLS
ENVIRONMENTAL

Ivanplats (Pty) Ltd
Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province

Environmental Authorisation Number: 12/1/9/2-W32, Mining Right Number: LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) intends to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (Platreef Project). Ivanplats obtained both the Mining Right (LP30/5/1/2/2/10067MR) and Environmental Authorisation (12/1/9/2-W32) for the Platreef Project in 2014. Ivanplats has since commenced with the sinking and development of Shaft 1 (ventilation intake shaft). Furthermore, mine infrastructure has been established to support the sinking of Shaft 1 (access road, a mine boundary fence and temporary facilities such as workshops and offices). The approved mine infrastructure footprint has been reduced due to the encroachment of the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities which established residential plots in close proximity to the proposed mine infrastructure area. Ivanplats has consequently revised the approved mine layout to ensure an optimum use of the reduced footprint area. This change to the approved mine layout necessitates the requirement for an Amendment Application process to the relevant licences in terms of the Regulation 31 of the EIA Regulations (GN R. 982) of December 2014 promulgated in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended (NEMA) and Section 102 in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002). The Department of Mineral Resources (DMR) will be the Competent Authority and Digby Wells Environmental (Digby Wells) has been appointed by Ivanplats as the independent Environmental Assessment Practitioner for the Amendment Application process. Digby Wells Environmental undertook the original Environmental and Social Impact Assessment (ESIA) for the Platreef Project in 2013.

Project Description

The Platreef Project is located on the farms Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS, situated within the Mogalakwena Local Municipality and Waterberg District Municipality in the Limpopo Province, approximately 8 km northwest of the town of Mokopane and can be accessed via the N11 Highway. The key activities and infrastructure that are proposed to be amended include, but are not limited to: the increase in height of the headgear, inclusion of a production shaft, inclusion of waste rock crushers, separation of stockpiles and an amendment to the height and footprint of the stockpiles, route amendment to the tailings storage facility pipeline, repositioning of water management structures including the stormwater dam and attenuation dams, a new stormwater drain, distribution powerlines and substations and inclusion of diesel generators.

Public Participation

Stakeholders affected by or interested in the Platreef Project Amendment Process are invited to register as an Interested and Affected Party (I&AP) to become involved in the consultation process. Comments and or questions can be addressed to the Digby Wells Stakeholder Engagement Office using the information as provided below. The Amended Environmental Impact Assessment (EIA) Report and Environmental Management Plan (EMP) will be available to the public from **29 March to 28 April 2016** at the places as indicated below.

Person	Location	Contact
Rifilwe Madisa	Mogalakwena Public Library, corner Van Riebeeck and Pretorius Streets	9015) 491 9729
Lucy Mashetisho	Mahwelereng Public Library, Mahwelereng Village	078 628 3326
Qondile Monareng	www.digbywells.com (under Public Documents) or phone for CD copy	(011) 789 9495
Ivanplats SED Department	7 Second Street, Old Industrial Area, Mokopane or Ivanplats mobile SED unit	(015) 491 0600

Invitation to Public Meetings

Public Meetings will be held to discuss contents of the Amended EIA Report / EMP and to obtain stakeholder comments, as indicated below.

Date	Time	Venue
13 April 2016	13:00 – 18:00	Magongoa Village, Open Fields, Marquee Tent
13 April 2016	13:00 – 18:00	Tshamahansi Village, Open Fields, Marquee Tent

Digby Wells Environmental
Qondile Monareng or Nestus Bredenhann
Tel: (011) 789 9495 Fax:086 583 5715 Postal address: Private Bag X10046, Randburg, 2125
Email: gondile.monareng@digbywells.com or nestus.bredenhann@digbywells.com
www.digbywells.com (under Public Documents) *Project Number: IVA3396*

DIGBY WELLS
ENVIRONMENTAL

Ivanplats (Pty) Ltd

Kgopelo ye e Fetotšwego ya Moepo wa Platinamo wa Ka tlase ga mobu wa Platreef, kgauswi le Mokopane, Profenseng ya Limpopo

Nomoro ya Tumelelo ya Tikologo: 12/1/9/2-W3, Nomoro ya Tokelo ya Moepo: LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) e beakanyetša go hlabolla le go laola moepo wa ka tlase ga mobu le mananeokgoparara ao a amanago le wona , kgauswi le Mokopane, Profenseng ya Limpopo (Protšeke ya Platreef). Ivanplats e hweditše bobedi Tokelo ya Moepo (LP30/5/1/2/2/10067MR) le Tumelelo ya Tikologo (12/1/9/2-W32) bakeng sa Protšeke ya Platreef ka 2014. Go tloga ka nako yeo Ivanplats e thomile ka go rafa goba go hlabolla Šafote ya 1 (šafote ya tsenyomoya). Godimo ga moo, mananeokgoparara a moepo a hlomilwe go thekga go epša ga Šafote ya 1 (phihlelelo ya moepo, legora la mollwane le dinolofatši tša nakwana tša go swana le diwekšopo le dikantoro. Mohlala wa mananeokgoparara a moepo wo o dumeletšwego o fokoditšwe ka baka la gore ditšhaba tša Ga-Kgobudi le Ga-Kgobudi 2 (Mzombane) di ile tša hloma dipoloto tša bodulo kgauwi le tikologo ya mananeokgoparara a moepo wo o šišintšwego. Ka gona Ivanplats e bušeleditše peakanyo ye e dumeletšwego ya moepo go netefatša tšhomišo ye kaone ya mohlala wo o fokoditšwego wa mananeokgoparara Phetogo ye ya peakanyo ye e dumeletšwego ya moepo e ile ya hloka gore go be le dinyakwa tša Tshepedišo ya Kgopelo ye e Fetotšwego go dilaesense tša maleba go ya ka Molawana wa 31 wa melawana ya EIA (GN R. 982) wa Manthole 2014 wo o tsebagaditšwego go ya ka Molao wa Bosetšhaba wa Taolo ya Tikologo wa 1998 (Molao wa 107 wa 1998) bjalo ka ge o fetotšwe (NEMA) le Karolo ya 102 go ya ka Molao wa Tlhabollo ya Methopo ya Diminerale le Petroleamo wa 2002 (Molao wa 28 wa 2002). Kgoro ya Methopo ya Diminerale (DMR) e tla ba Taolo ya Bokgoni go Kgopelo gomme Digby Wells Environmental (Digby Wells) e thwetšwe ke Ivanplats bjalo ka Modiragatši wa go Ikema wa Tshekatsheko ya Tikologo bakeng sa tshepedišo ya Kgopelo ye e fototšwego. Digby Wells Environmental e dirile Tshekatsheko ya Seabe sa Tikologo le Leago ebago ESIA bakeng sa protšeke ya Platreef ka ngwaga wa 2013.

Tlhalošo ya Protšeke

Protšeke ya Platreef e dipolaseng tša Macalacaskop 243 KR, Turfspruit 241 KR le Rietfontein 2 KS gomme e ka gare ga Mmasepala wa Selegae wa Mogalakwena le Mmasepala wa Tikologo wa Waterberg ka Profenseng ya Limpopo. Mešomo ye bohlokwa le mananeokgoparara ao a šišinywago go fetošwa a akaretša eupša a sa kgaoletšwe go: koketšo ya dišireletšahlogo, kakaretšo ya šafote ya tšweletšo, kakaretšo ya didirišwa tša go pšhatla maswika a ditšhila, karoganyo ya mekgobo ya phahlo le phetošo ya tsela ya phaephe ya senolofatši sa bobolokelo, peakanyo lefsa ya dibopego tša taolo ya meetse go akaretšwa le letamo la meetsefula le matamo ao a fokotšegago; peakanyoboelatšhila ya meetsefula ye mpsha , diphaephe le ditiši tša kabo ya mohlagase go akaretšwa le ditšeneraithara tša tisele.

Go kgatha tema ga setšhaba.

Bakgathatema bao ba angwago ke Protšeke goba bao ba nago le kgahlego ya Protšeke ba laletšwa bjalo go ingwadiša bjalo ka Bakgathatema ba go ba le kgahlego le bao ba angwago (I&AP) go kgatha tema tshepedišong ya ditherišano. Ditshwayotshwayo le diforomo tša ngwadišo di ka romelwa Kantorong ya Ditherišano le Baamegi ya Digby Well ka go šomiša tshedimošo ye filwego ka tlase. Pego ya Tshekatsheko ya Seabe sa Tikologo (EIA) le Pegohlangwa ya Leano la Taolo ya Tikologo di tla hwetšagala go setšhaba 29 Hlakola go fihla ka 28 Moranagng l 2016 mafelong a a laeditšwego ka tlase

Motho	Lefelo	Nomoroya boikgokaganyo
Rifilwe Madisa	Bokgobapuku bja Setšhaba bja Mogalakwena, khona ya Mmila wa Van Riebeeck le Pretorius	9015) 491 9729
Lucy Mashetisho	Bokgobapuku bja Setšhaba bja Mahwelereng, Motseng wa Mahwelereng g	078 628 3326
Qondile Monareng	www.digbywells.com (ka tlase ga Ditokumente tša Setšhaba) goba o letše bakeng sa khophi ya CD	(011) 789 9495
Kgoro ya SED ya Ivanplats	7 Mmila wa Second, Old Industrial Area, Mokopane goba Ivanplats *mobile SED unit*	(015) 491 0600

Taletšo ya Dikopano tša Setšhaba

Dikopano tša setšhaba di tla swarwa go ahlaahla diteng tša Pego ya EIA ye e fetotšwego /EMP lego hwetša ditshwayotshwayo, bjalo ka ge go laeditšwe ka tlase.

Letšatšikgwedi	Nako:	Lefelo
13 Moranang 2016	13:00 – 18:00	Motseng wa Magongoa, Lefelong le le bulegilego, Tenteng ya Marquee
13 Moranang 2016	13:00 – 18:00	Motseng wa Tshamahansi, Lefelong leo le bulegilego, Teneteng ya Marquee

Digby Wells Environmental
Qondile Monareng goba Nestus Bredenhann
Mogala: (011) 789 9495 Fekese:086 583 5715 Aterese ya Poso: Private Bag X10046, Randburg, 2125
Imeile: qondile.monareng@digbywells.com goba nestus.bredenhann@digbywells.com
www.digbywells.com (under Public Documents) Nomoro ya Protšeke: IVA3396

DIGBY WELLS
ENVIRONMENTAL

Ivanplats (Pty) Ltd

Xikombelo Xa Kucinca Xa Platreef, Mugodi Wa Le Hansi Lowu Nga Ekusuhi Na Mokopane Exifundzeninkulu Xa Limpopo.

Mpfumelelo watimhaka ta Mbango: 12/1/9/2-W32, Mpfumelelo wo Cela Mugodi : LP30/5/2/2/1/10067MR

Ivanplats (Pty) Ltd. (Ivanplats) yi tiyimisele ku aka no tirhisa mugodi wale hansi wa Pulatinamu na switirhisiwa leswi fambelanaka na swa mugodi ekusuhi na Mokopane, exifundzeninkulu xa Limpopo (Phurojeke ya Plaatreef). Ivanplats yikumile mpfumelelo wo cela mugodi wale hansi (LP30/5/1/2/2/10067MR) na mpfumelelo watimhaka ta mbango (12/1/9/2-W32) swa phurojeke ya Platreef hi lembe ra 2014. Ivanplats yi sungurile mingingiriko yo celela no aka shaft1 (shaft leyi nghenisaka moya emugodini). Kuyisa emahlweni switirhisiwa swa le mugodini swi kona ku pfuneta hi mintirho yo celela shaft 1, switirhisiwa so njhe hi (mapatu, rihlampfu ra ndzilikano wa mugodi na miako ya nkarhinyana tani hi tiwekixopo na tihofisi). Ndzilikano lowunga pfumeleriwa wa switirhisiwa swa mugodi wu hungusiwile hikokwalaho ka kumeka wuri ekusuhi swinene na leka Ga-Kgobudi na leka Ga-Kgobudi 2 (Mzombane). Ivanplats yi pfuxetile ndzilikano wa yona lowunga pfumeleriwa wa mugodi ku yita kota kutirha hiku hetiseka eka ndhawu leyi hungusiweke. Kucinca ka ndzilikano wa mayini swiendle leswaku kuva na xikombelo xo cinca hikuya hi milawu ya Regulation 31 ya EIA (GNR 982) ya Nwendzamhala hi lembe ra 2014 leyi tiyisiweke hikuya hi Nawu wa Rixaka wa Mafambiselo ya Mbango, 1998, (Nawu wa 107 wa 1998) (NEMA) na xiyenge xa 102 hikuya hi Nawu wa Nhluvukiso wa Switirhisiwa swa Swicelwa na Mafurha, 2002 (Nawu wa 28 wa 2002). Ndzawulo ya switirhisiwa swa Timinerali (DMR) hi yona yi tekaka xiboho. Digbywells Environmental (Digby Wells) yi thoriwile hi Ivanplats ku fambisa purosese ya xikombelo xa ku cinca xa Plaatreef. Digby wells hi yona yi hundiseke Mahlelelo ya Ntshikelelo wa Mbango na vanhu eka Phurojeke ya Plaatreef hi lembe ra 2013.

Nhlamuselo Ya Phurojeke

Phurojeke ya Plaatreef yile emapurasini ya Macalacaskop 243 KR, Turfspruit 241 KR and Rietfontein 2 KS lawa ya welaka ehansi ka Masipala wa muganga wa Mogalakwena eka Masipala wa xifundza xa Waterberg wa xifundzankulu wa Limpopo, kwalomu ka 8 km nwalungu vupeladyambu bya doroba ra Mokopane. Ndhawu ya phurojeke yi fikeleriwa hi ku tirhisa gondzo ra N11. Mintirhi nkulu na switirhisiwa leswi kunguhatiweke ku cinciwa hileswilandzelaka: Ku ta engeteliwa kuleha ka vuaki bya timhandzhe na swidloko, ku ta katsiwa ndhawu yo sila ndhundhuma ya thyaka, ku cinciwa ka ku leha ka anama ka ndhawu yo vekela swicelwa , ku cinca ka ndlela yo fambisa payiphi leyi yiyaka ndhawini yo hlayisa thyaka , ku cinca ka tindhawu to hlayisela mati ku katsa madamu yo hlayisela ku katsa damu ro hlayisa mati ya mpfula, swindledyana swo fambisa mati ya mpfula, kuhangalasa tilayini ta gezi na switichi swa gezi na ku katsiwa ka michini ya jhenerata ya dizele.

Ku ghenisa xandla hi vanhu

Swiyenge swo tsakela no khumbeka hi ku cinca ka maendlelelo ya phurojeke ya Plaatreef swa rhambiwa kuti rhijisitara leswaku vata kota ku ghenelela ka mafambiselo lawa. Mavonelo na swivutiso swinga rhumeliwa eka hofisi ya Digby Wells hiku tirhisa leswi tsaliweke la hansi. Mpfapfarhuto lowu cinciweke wa Mpfumelelo wa Mahlelelo ya Ntshikelelo wa mbango (EIA) na Nongonoko wa mafambiselo ya mbango (EMP) wa xikopu wu tava kona leswaku vanhu va wu langutisa ku sukela hiti **29 Nyenyankulu kufikela ti 28 Dzivamisoko 2016** eka ti ndhawu leti hlayiweke la hansi.

Vito	Ndhawu	Vutihlanganisi
Rifilwe Madisa	Mogalakwena Public Library, corner Van Riebeeck and Pretorius Streets	9015) 491 9729
Lucy Mashetisho	Mahwelereng Public Library, Mahwelereng Village	078 628 3326
Qondile Monareng	www.digbywells.com (under Public Documents) or phone for CD copy	(011) 789 9495
Ivanplats SED Department	7 Second Street, Old Industrial Area, Mokopane or Ivanplats mobile SED unit	(015) 491 0600

Xirhambo eka ti hlengeletano ta vaaka tiko

Mihlangano ya vaaka tiko yita khomiwa ku hlela timhaka ta ku cinca eka mpfapfarhuto wa mahlelelo ya ntshikelelo wa mbangu (EIA) na nongonoko wa mafambiselo ya mbango (EMP) na ku kuma mavonelo ya swiyenge leswi nga na kutsekela kumbe ku khumbheka hi phurojheke hi masiku lawa landzelaka.

Siku	Nkarhi	Ndhawu
13 Dzivamisoko 2016	13:00 – 18:00	Magongoa Village, Open Fields, Marquee Tent
13 Dzivamisoko 2016	13:00 – 18:00	Tshamahansi Village, Open Fields, Marquee Tent

Digby Wells Environmental

Qondile Monareng kumbe Nestus Bredenhann

Riq: (011) 789 9495 Fekisi:086 583 5715 Kherefu ya poso: Private Bag X10046, Randburg, 2125

Email: qondile.monareng@digbywells.com kumbe nestus.bredenhann@digbywells.com

www.digbywells.com (ehansi ka Public Documents) *Nomboro ya Phurojeke: IVA3396*

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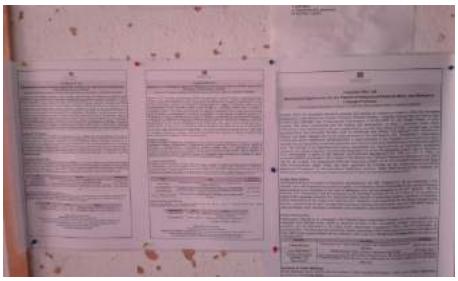
Ivanplats (Pty) Ltd

Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province

SITE NOTICES

Site notices placed at publically accessible places on 8, 14, 17 and 22 March 2016

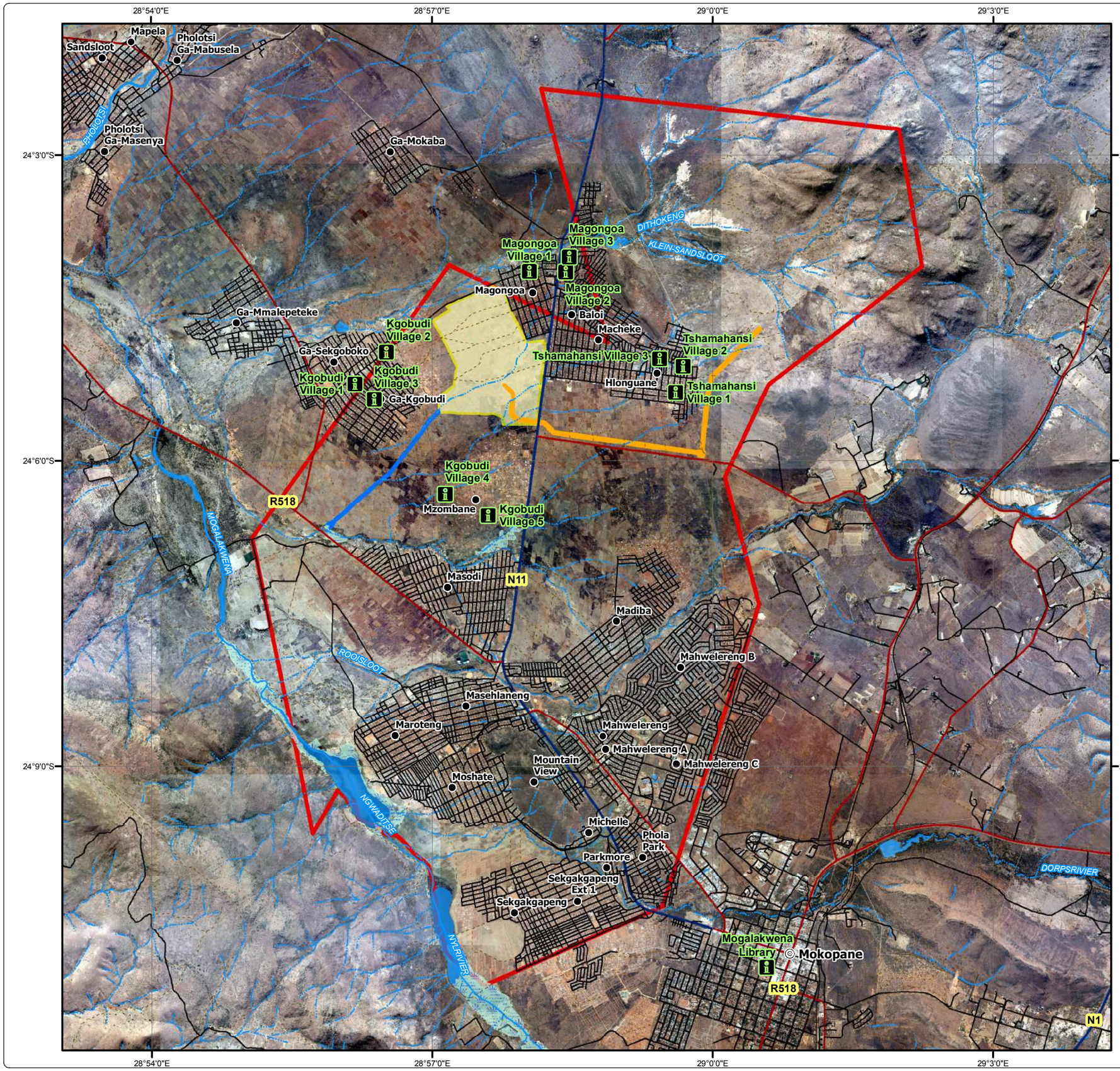
Placement of Site Notices within surrounding communities and at Traditional Authorities and Public Libraries

Public Place	Coordinates / Location	Photo
Mogalakwena Public Library Corner Van Riebeeck and Pretorius Streets Placed on Notice Board	27°02'35.93"S 26°14'5.63"E	
Kgobudi Village on a fence	6,654.95 X -2,664,970.45 Y	
Kgobudi Village on a fence	-5,910.15 X -2,664,394.92 Y	

Kgobudi at a Local Spaza Shop	-6,126.38 X -2,665,250.96 Y	
Kgobudi on a water tank	-4840.04004 X -2666969.23123 Y	
Kgobudi at Ditlou Spaza Shop	-4,062.67 X -2667, 351.44 Y	
Magongoa on a street pole	-3,316.46 X -2,662,930.62 Y	

Magongoa on a street pole (soccer field)	- 2,657.96 X - 2,662, 944.88 Y	
Magongoa on a street pole	-2,595.16 X -2,662,669.63 Y	
Tshamahansi at a local Spaza Shop	-669.7742895 X -2,665,125.83 Y	
Tshamahansi at a local Supermarket	-531.4067499 X -2,664,654.21 Y	

Tshamahansi on a fence outside a local shop	-958.1887881 X -2,664,515,12 Y	



Plan 1

Ivanplats (Pty) Ltd

Site Notices

Legend

- Site Notice Location
- Mining Right Area
- Amended Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake

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• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator	Ref #: scm.IVA3396.201605.003
Datum: Hartebeesthoek 1994	Revision Number: 1
Central Meridian: 29°E	Date: 03/05/2016

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Kilometres

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Appendix C5: Invitation to Authorities

Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:11 PM
To: 'ngoashenga@dpw.limpopo.gov.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_Public Works_FINAL.pdf

Dear Mr Ngoashenga

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
Nestus

Nestus Bredenhann
Departmental Manager: Stakeholder Engagement

Cell: (083) 449 3585
Tel: (011) 789 9495
Fax: (011) 789 9498

nestus.bredenhann@digbywells.com
www.digbywells.com

WE HAVE MOVED – VIEW OUR NEW OFFICE LOCATION
Digby Wells House, Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191, South Africa.

DIGBY WELLS
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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:05 PM
To: 'srmphasha@ruraldevelopment.gov.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_Land Reform_FINAL.pdf

Dear Mr Mphasha

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
Nestus

Nestus Bredenhann
Departmental Manager: Stakeholder Engagement

Cell: (083) 449 3585
Tel: (011) 789 9495
Fax: (011) 789 9498

nestus.bredenhann@digbywells.com
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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:12 PM
To: 'mgalimberti@sahra.org.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_SAHRA_FINAL.pdf

Dear Ms Galimberti

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
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Departmental Manager: Stakeholder Engagement

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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:13 PM
To: 'smashao@waterberg.gov.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_Waterberg DM_FINAL.pdf

Dear Ms Mogotlane

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
Nestus

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Departmental Manager: Stakeholder Engagement

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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:09 PM
To: 'mthombenimm@mogalakwena.go.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_Mogalakwena LM_FINAL.pdf

Dear Mr Mthombeni

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

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Regards
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Departmental Manager: Stakeholder Engagement

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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:06 PM
To: 'thivhafunipo@ledet.gov.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_LEDET_FINAL.pdf

Dear Ms Thivhafuni

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

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Regards
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Departmental Manager: Stakeholder Engagement

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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:03 PM
To: 'senganib@dwa.gov.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_DWS_FINAL.pdf

Dear Mr Sengani

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

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Regards
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Departmental Manager: Stakeholder Engagement

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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:02 PM
To: 'Aaron.Kharivhe@dmr.gov.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_DMR_FINAL.pdf

Dear Mr Kharivhe

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
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Departmental Manager: Stakeholder Engagement

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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:00 PM
To: 'mathasem@dwa.gov.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_DAFF_FINAL.pdf

Dear Ms Mathase

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
Nestus

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Departmental Manager: Stakeholder Engagement

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Qondile Monareng

From: Qondile Monareng
Sent: Tuesday, March 29, 2016 3:09 PM
To: 'stanleymh@pprotect.org'
Subject: FW: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396: Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province; IVA3396 _Authorities_Invite_letter_Public_Protector_FINAL.pdf

Dear Mr Mingha

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

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Regards
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Departmental Manager: Stakeholder Engagement

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Stakeholder Engagement

From: Stakeholder Engagement
Sent: Thursday, April 7, 2016 2:46 PM
To: 'lesetja.masenya@dcs.gov.za'
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_MYDO_FINAL.pdf

Dear Mr Masenya

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
Nestus

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Departmental Manager: Stakeholder Engagement

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Stakeholder Engagement

From: Stakeholder Engagement
Sent: Thursday, April 7, 2016 2:49 PM
To: 'amavomoca@gmail.com'
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_MogalCDS_FINAL.pdf

Dear Mr Yawanah

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
Nestus

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Departmental Manager: Stakeholder Engagement

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Stakeholder Engagement

From: Stakeholder Engagement
Sent: Thursday, April 7, 2016 2:48 PM
To: 'stambocharles6@gmail.com'
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_MKMVA_FINAL.pdf

Dear Mr Mothapo

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
Nestus

Nestus Bredenhann
Departmental Manager: Stakeholder Engagement

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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 5:08 PM
To: 'litholek@sac.limpopo.gov.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_LIHRA_FINAL.pdf

Dear Mr Lithole

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
Nestus

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Departmental Manager: Stakeholder Engagement

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Stakeholder Engagement

From: Stakeholder Engagement
Sent: Thursday, April 7, 2016 2:45 PM
To: shimahk@gmail.com
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_Kopano_FINAL.pdf

Dear Mr Kekana

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

Should you require any additional, please do not hesitate to contact myself or Qondile Monareng (copied in hereto).

Regards
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Departmental Manager: Stakeholder Engagement

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Qondile Monareng

From: Qondile Monareng
Sent: Tuesday, March 29, 2016 3:12 PM
To: 'asedupane@crlcommission.org.za'
Subject: FW: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396: Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province; IVA3396 _Authorities_Invite_letter_CRLCommission_FINAL.pdf

Dear Advocate Sedupane

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

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Regards
Nestus

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Departmental Manager: Stakeholder Engagement

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Nestus Bredenhann

From: Nestus Bredenhann
Sent: Wednesday, 23 March 2016 4:58 PM
To: 'makokomg@coghsta.limpopo.gov.za'
Cc: Qondile Monareng
Subject: IVA3396 / Invitation to Key Stakeholder Meeting - Amendment Application for the Platreef Underground Platinum Mine
Attachments: IVA3396_Authorities_Invite_letter_COGTA_FINAL.pdf

Dear Mr Makoko

We cordially invite you to attend a **Key Stakeholder Meeting** (details included in the attached letter) where details of the amendment to Ivanplats (Pty) Ltd's approved applications for the Platreef Underground Platinum Mine will be shared together with specialist study findings.

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Regards
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Departmental Manager: Stakeholder Engagement

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Appendix C6: Updated EIA/EMP Report Announcement Letter

PROJECT NO: IVA3396 26 May 2016

Ivanplats (Pty) Ltd

Amendment Application for the Platreef Underground Platinum Mine, near Mokopane, Limpopo Province

Environmental Authorisation Number: 12/1/9/2-W32, Mining Right Number: LP30/5/2/2/1/10067MR

Submission and availability of the Updated Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) Report for public comment

Dear Stakeholder,

Digby Wells would like to thank all stakeholders that have attended the stakeholder meetings and provided comments on the Draft Amended Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) Reports for the Platreef Underground Platinum Mine Application Amendment. The public comment period, as part of the environmental regulatory process, concluded on 28 April 2016 and the EIA/EMP Reports, together with the Comment and Response Report (CRR) has been updated and submitted to the Limpopo Department Mineral Resources (DMR). The updated EIA and EMP Reports will be available for 21 days for public comment from **Friday, 27 May to, Friday, 27 June 2016** on the Digby Wells website (www.digbywells.com) under Public Documents. A hardopy of the EIA/EMP Report will also be available at the Ivanplats Mine Office, in Mokopane.

Comments must be submitted directly to the DMR and it is requested that such be copied to Digby Wells; please include the project and application reference numbers in all correspondence. The following DMR contact details can be used for submissions:

Attention: Mr Thivhulwani Kolani

Limpopo Department of Minerals Resources

Directorate: Mine Environmental Management Section, Limpopo Region

By Fax: (086) 216 8250

By Post: Private bag X9484, Polokwane

By Hand: Broll Building, 101 Dorp Street, Polokwane

You are also welcome to request a CD and contact us on Tel: 011 789 9495, Fax: 086 583 5715, Postal: Private Bag X10046, Randburg, 2125, email: qondile.monareng@digbywells.com or nestus.bredenhann@digbywells.com. Your input and feedback are valued.

Yours sincerely

Qondile Monareng

Stakeholder Engagement Office

Appendix C7: Comments and Response Report (CRR)

Name of Individual	Consulted	Date of comments received	Issues Raised	EAPs response to issues	Category
Aubrey Langa	Written Comment	13-Mar-16	This comment on the notification placed in the Bosvelder local newspaper dated the 10 March 2016 is made by interim community representatives (ICRs), who were purportedly established generally in accordance with prescribed interim procedures issued under the Interim Protection of Informal Land Rights Act (IPILRA) and specifically following the directive issued to Ivanplats (Pty) Ltd (Ivanplats) on the 8 May 2014 by the provincial officials of the DRDLR.	The notification placed in the Bosvelder local newspaper is in accordance with the requirements of the National Environmental Management Act, Act 107 of 1998 as well as the Environmental Impact Assessment Regulations, 2014 (GNR 982 of 4 December 2014). Chapter 6 of the EIA Regulations provides the public participation requirements which are required to be adhered to as part of the Environmental Amendment Process in accordance with Regulation 31. Regulation 41(1) includes inter alia the requirement to inform interested and affected parties of the process through the placing of an advert in (i) one local newspaper or (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations". The public consultation process is not governed by the Interim Protection of Informal Land Rights Act, 1996 (Act No 31 of 1996.)	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	The above-mentioned notification is in relation to an application in terms of section 102 of the MPRDA for amendment of mining right by Ivanplats, in order to revise mining right area. According to the notification, the amendment is allegedly prompted by alleged encroachment of residential structures on the mining area delineated in the mining right granted on the 30 May 2014.	The mine layout has been changed and the area to be used has been reduced to accommodate the growth of the communities. Due to the changes in the mine infrastructure layout an amendment application in terms of Section 102 of the MPRDA as well as a Section 31 of the NEMA EIA Regulations, 2014 was necessary. Regulation 31 provides that " an environmental authorisation may be amended by the following process prescribed in this Part if the amendment will result in a change to the scope of a valid environmental authorisation where such change will result in an increased level or nature of impact where such level or nature of impact was not (a) assessed and included in the initial application for environmental authorisation; or (b) taken into consideration in the initial environmental authorisation and the change does not, on its own, constitute a listed or specified activity.	Environmental Impact Assessment

Aubrey Langa	Written Comment	13-Mar-16	Because the amendment is substantive and affects listed activities in terms of the NEMA, a full EIA in terms of the NEMA 2014 Regulations is required in addition to the abovementioned social licence to operate consultation requirement.	It should be noted that the proposed amendments do not constitute new listed activities in terms of the EIA Regulations 2014 as all Project related activities have either been approved in terms of the EIA Regulations, 2010 or do not trigger the relevant thresholds in the EIA Regulations, 2014. Ivanplats is therefore applying for an Amendment to the Approved Environmental Authorisation (2014) in terms of Section 24 of NEMA. As part of the amendment application, Digby Wells Environmental have also undertaken a public consultation process, including the necessary public notifications, making the EIA Addendum Report available for review and comment and holding stakeholder consultation meetings. The amendments are substantive but as indicated above, the change to the mine infrastructure does not trigger any new activities but merely changes to the existing listed activities which were authorised in terms of the Environmental Authorisation issued by the Limpopo Department of Economic Development, Environment and Tourism (LEDET) on 27 June 2014 with reference No 12/1/9/3-W32. Two further amendments to the EA have been granted on 19 August 2014 and 30 July 2015.	Environmental Impact Assessment
Aubrey Langa	Written Comment	13-Mar-16	Although Digby Wells have a history of engagement with us and that we are registered on its database in a different representative capacity as I&APs, we request that we be henceforth be registered on the database as Interim Community Representatives (ICRs). This is in order for Digby Wells as independent consultants to recognise, respect and promote constitutional and statutory rights of occupants of the communal and state land properties involved.	Digby Wells has provided all necessary documentation and notices to Mr Abrey Langa and will register the Interim Community Representatives on proof of incorporation of the organisation, a representative mandate and a list of members which form part of the ICR.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	a. Omission by Digby Wells to also advertise notice of consultation with informal land rights owners in accordance with interim procedures under the IPILRA, thereby covering the how aspect of consultation requirements. b. The omission would result in lack of distinction being made between consultation and public participation processes, which is a concern in that this does not accords with living customary law, customs and practises.	The public consultation process is undertaken in accordance with the requirements of the National Environmental Management Act, Act 107 of 1998 as well as the Environmental Impact Assessment Regulations, 2014 (GNR 982 of 4 December 2014). Chapter 6 of the EIA Regulations provides the public participation requirements which are required to be adhered to as part of the Environmental Amendment Process in accordance with Regulation 31. The public consultation process for the application of an amendment to an existing approved Environmental Authorisation is not governed by the Interim Protection of Informal Land Rights Act, 1996 (Act No 31 of 1996.) These process are particularly relevant to the issues relating to the land rights which may be under dispute and are being dealt with by Ivanplats in separate consultation forums.	Public Participation

Aubrey Langa	Written Comment	13-Mar-16	c. The date set for public participation is the 13 April 2016, which falls on Wednesday. We are concerned that the date is not suitable for attendance by many informal land rights holders, some of which are employed as far afield as Gauteng province. More about this is said hereunder. d. It would also be a concern, noting that the venue is at Magongoa Sports Stadium, if other directly affected villages would be afforded sufficient transport to the venue.	Additional stakeholder meetings were held on Sunday 17 April 2016 at three different locations and included, but not limited to, the following communities: Mzombane, Sekgoboko, Kgobudi, Masehlaneng, Moshate, Maroteng, Masodi and Tshamahansi.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	e. It would further be a concern if the following stakeholders are not invited to participate in public meetings: i. Relevant NGOs, especially those that are known specialist in the activities applied for; and ii. Government officials, especially those who have statutory obligation to comment on the application.	Representatives from the relevant NGOs and Government entities were formally invited by means of a letter and telephonic follow-ups were also undertaken. Proof is provided under Appendix C5 of the EIA Addendum Report.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	Omission to advertise consultation requirements under the IPILRA: In terms of section 25(2)(d) of the MPRDA, Ivanplats is obliged to comply with “any other law” in relation to its activities that include this amendment. In this case the relevant law is the IPILRA, which governs access to, use and occupation of communal and state land properties for commercial mine development, notwithstanding that section 5 of the MPRDA grants the mining rights holder statutory access to the mining right area. We submit that the right is a limited and ancillary right, subject to compliance with consultation requirements under the IPILRA. It is on this basis that Ivanplats and Digby Wells ought to have advertised this consultation requirement to run concurrently the advertisement referred to herein. What is mandatory is that the informal land owners must be consulted in accordance with prescribed interim procedures, which covers the how aspect of the consultation process, prior to implementation of	The public consultation process is undertaken in accordance with the requirements of the National Environmental Management Act, Act 107 of 1998 as well as the Environmental Impact Assessment Regulations, 2014 (GNR 982 of 4 December 2014). Chapter 6 of the EIA Regulations provides the public participation requirements which are required to be adhered to as part of the Environmental Amendment Process in accordance with Regulation 31. The public consultation process for the application of an amendment to an existing approved Environmental Authorisation is not governed by the Interim Protection of Informal Land Rights Act, 1996 (Act No 31 of 1996.) These process are particularly relevant to the issues relating to the land rights which may be under dispute and are being dealt with by Ivanplats in separate consultation forums.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	Flowing from the above, it means that Ivanplats and Digby Wells must have implemented the interim procedures proceedings, notably the requirement to advertise a Pre-Consultation Meeting as a point of departure and prior to activities planned for the 13 April 2016. A Pre-Consultation Meeting supervised by officials of the DRDLR is thus statutorily a pre-requisite for the public participation meeting scheduled for the 13 April 2016. In terms of Regulation 39 of the EIA 2014 Regulations, Ivanplats is obliged to obtain a written consent of the landowner before applying for an amendment. It is noted that some of the activities applied for are not directly mining-related activities.	The public consultation process is undertaken in accordance with the requirements of the National Environmental Management Act, Act 107 of 1998 as well as the Environmental Impact Assessment Regulations, 2014 (GNR 982 of 4 December 2014). Chapter 6 of the EIA Regulations provides the public participation requirements which are required to be adhered to as part of the Environmental Amendment Process in accordance with Regulation 31. The public consultation process for the application of an amendment to an existing approved Environmental Authorisation is not governed by the Interim Protection of Informal Land Rights Act, 1996 (Act No 31 of 1996.) These process are particularly relevant to the issues relating to the land rights which may be under dispute and are being dealt with by Ivanplats in separate consultation forums. Pre-consultation meetings are held as part of a long-term surface lease process.	Public Participation

Aubrey Langa	Written Comment	13-Mar-16	A history of complaints, dispute and antagonism relating to the manner of consultation with traditional community of Mokopane is well-known, and a criminal case based on section 49A of the NEMA statutory offence is opened against Ivanplats (CAS 143/7/2014) for contravention of Standard Condition 1.7 of the EA issued by the LEDET. We are seeking legal advice from prosecutors if the omission is in contravention of the Standard Condition and thus amounts to statutory offence.	Noted and comment forwarded to Ivanplats.	General
Aubrey Langa	Written Comment	13-Mar-16	Distinction between public participation and consultations: Our concern is that Digby Wells and Ivanplats are disregarding concerns expressed in countless number of representations made to Ivanplats and officials of the DMR, the LEDET, the DRDLR and the SAHRA, among others, that the manner in which the traditional members of the community are engaged does not make a distinction between consultation and public participation processes and that this does not accords with the rights and interest of the members.	The public participation process included consultation with government departments, engagement with traditional authorities of the Moshate and Tshamahansi communicates, key stakeholder consultation with political parties, NGO's, municipalities, businesses and landowners. Additional, public meetings were arranged for the 17th of April on a Sunday for those who could not attend during the week. The Ga-Kgobodi was scheduled at the Lekwa Sports Ground from 09:00 – 11:00 for the following communities: Mzombane, Sekgoboko and Kgobudi. The Masodi public meeting was scheduled at the Masodi High Sports Ground 09:00 – 11:00 for the following communities: Masehlaneng, Moshate, Maroteng and Masodi. The Tshamahansi meeting was scheduled at the Tshamahansi Village from 09:00 – 11:00	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	The call for this distinction to be made is premised on the following: a. That both the MPRDA and the NEMA do not prescribe the manner of consultation. b. That the minimum standard of consultation requirements set in the NEMA Regulations does not preclude or negate any other manner of consultation. c. That the IPILRA prescribes the manner of consultation when an application involves communal and state land.	The public participation process included consultation with government departments, engagement with traditional authorities of the Moshate and Tshamahansi communicates, key stakeholder consultation with political parties, NGO's, municipalities, businesses and landowners. Additional, public meetings were arranged for the 17th of April on a Sunday for those who could not attend during the week. The Kgobodi was scheduled at the Lekwa Sports Ground from 09:00 – 11:00 for the following communities: Mzombane, Sekgoboko and Kgobudi. The Masodi public meeting was scheduled at the Masodi High Sports Ground 09:00 – 11:00 for the following communities: Masehlaneng, Moshate, Maroteng and Masodi. The Tshamahansi meeting was scheduled at the Tshamahansi Village from 09:00 – 11:00	Public Participation

Aubrey Langa	Written Comment	13-Mar-16	d. That the IPILRA expressly recognises living customary law, customs and practices of the community concerned. The living customary law observed in this area provides for distinction between consultation and public participation processes, in that it requires a private meeting of minds based on provision of information, before a public discourse is engaged into based on being informed about the topic for the discourse. The engagement system is characterised as a six-layered system (family, household, clan, sub-village, village and tribal/community levels) rather than a system that centralises power and consultation entitlement exclusively in traditional leadership institutions. A kgothe-kgothe (public participation meeting) is the last layer and is meaningless if undertaken without the other underlying layers not being satisfied.		Public Participation
Aubrey Langa	Written Comment	13-Mar-16	e. That Digby Well and Ivanplats failed or refused to engage credible leaders of the community (and not only the headmen that are autocratically ruled by Kgoshi L. V. Kekana) pursuant to obtaining indigenous knowledge about an appropriate and non-distorted manner of engagement with traditional community of Mokopane. The goal and concomitant method of engagement used by Ivanplats is attainment of indirect and centralised rule of the community through an autocratic rule by traditional leaders, which because it is contrary to our democratic dispensation, Digby Wells should distance itself from the practice.	Digby Wells is responsible for a public consultation process in respect of the Environmental Authorisation Amendment Application Process in accordance with the requirements of the National Environmental Management Act, Act 107 of 1998 as well as the Environmental Impact Assessment Regulations, 2014 (GNR 982 of 4 December 2014). Chapter 6 of the EIA Regulations provides the public participation requirements which are required to be adhered to as part of the Environmental Amendment Process in accordance with Regulation 31.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	We suggest that Digby Wells contact those officials within the DRDLR who deal with the principle and practice of the interim procedures under the IPILRA, and not those are charged with land lease disposal as headed by Mr. Tinyiko Makamu in the Limpopo Province. By operation of the system the IPILRA Unit as headed by Ms Queen Folani (queen.filani@drdlr.gov.za; 012-312 312 9032; 082 824 4645) must be contacted in this regard. She would facilitate taking of tribal resolution and ministerial consent, which is required in terms if the interim procedures under the IPILRA. The two documents serve as proof that the community has been appropriately and adequately consulted.	The tribal resolution and ministerial consent is particular to the processes associated with the IPILRA which deals with informal land rights. The Environmental Amendment Process is an application for an amendment of existing rights and remain withing the approved mining area, no new listed activities are triggered. Ivanplats have a dedicated Stakeholder Engagement Department which undertakes continuous engagement with the communities.	General

Aubrey Langa	Written Comment	13-Mar-16	Given the tendency by Ivanplats to coerce consultants into non-compliance with rules, attention is drawn to the following conditions of the EA issued on the 27 June 2014 by the LEDET, and that contraventions thereof constitutes statutory offence in terms of section 49A of the NEMA on the part of Ivanplats and its consultants: a. Condition 36, which provides that all social issues must be addressed; b. Standard Condition 1.1, which reads “the holder of the EA shall be responsible for ensuring compliance with the conditions contained in this EA. This includes any person acting on holder’s behalf, including but not limited to, an agent, servant, contractor, sub-contractor, employee or person rendering to the holder of the EA”; c. Standard Condition 1.7, which requires Ivanplats to comply with other laws; d. Standard Condition 5.3, which reads “all complaints received from registered interested and affected parties (I&APs) during the construction and operational phase of the activity must be attended as soon as possible and addressed to the satisfaction of all concerned I&APs”; and e. Standard Condition in relation to appeal of authorisations, notably that the appeals we lodged against the WML and decision to amend location of the TSF suspends the authorisations and as such no further applications should be entertained pending finalisation of the appeals.	Digby Wells Environmental acts as an independent environmental assessment consultancy to Ivanplats and accordingly acts impartially in compliance with the respective regulatory requirements applicable to our profession. The legal advisors of Ivanplats are engaging with LEDET on whether the appeal in respect of the TSF referred to in this comment is a competent appeal and accordingly have not taken a view on the competence thereof. The WML appeal process has been dealt with and is no longer under consideration by the Department.	General
Aubrey Langa	Written Comment	13-Mar-16	We are concerned that a week’s day may not be suitable for public participation meetings since only the unemployed would only be catered for at the start of the meeting and that by the time those who are employed are able to make it to the venue after four o’clock in the afternoon, a lot would have been missed.	Additional stakeholder meetings were held on Sunday 17 April 2016 at three different locations and included, but not limited to, the following communities: Mzombane, Sekgoboko, Kgobudi, Masehlaneng, Moshate, Maroteng, Masodi and Tshamahansi.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	From the studies Digby Wells previously conducted it should be known that the biggest employer in the area is government, and that these persons are relied upon by the majority of poorly educated community members, the elderly and women, to listen and talk on their behalf. This means that the majority members of directly affected villages will be prejudiced from meaningful and effective participation even if this is by proxy.	Additional stakeholder meetings were held on Sunday 17 April 2016 at three different locations and included, but not limited to, the following communities: Mzombane, Sekgoboko, Kgobudi, Masehlaneng, Moshate, Maroteng, Masodi and Tshamahansi.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	Kindly motivate why a middle of the month Sunday is not the most suitable day, and why there is a change from previous practise from choice of this day	Additional stakeholder meetings were held on Sunday 17 April 2016 at three different locations and included, but not limited to, the following communities: Mzombane, Sekgoboko, Kgobudi, Masehlaneng, Moshate, Maroteng, Masodi and Tshamahansi.	Public Participation

Aubrey Langa	Written Comment	13-Mar-16	Previously Digby Wells made distinction between directly affected members of the community and indirectly members of the community. Note that for disposal of informal land rights that includes occupation of communal and state land properties by a developer, the distinction between the two is critical in relation to who is entitled to participation generally in the discourse and who must participate in decision-making regarding disposal of a commons or a ploughing field part of communal land property.	The public participation process included consultation with government departments, engagement with traditional authorities of the Moshate and Tshamahansi communities, key stakeholder consultation with political parties, NGO's, municipalities, businesses and landowners. Additional, public meetings were arranged for the 17th of April on a Sunday for those who could not attend during the week. The Kgobodi was scheduled at the Lekwa Sports Ground from 09:00 – 11:00 for the following communities: Mzombane, Sekgoboko and Kgobudi. The Masodi public meeting was scheduled at the Masodi High Sports Ground 09:00 – 11:00 for the following communities: Masehlaneng, Moshate, Maroteng and Masodi. The Tshamahansi meeting was scheduled at the Tshamahansi Village from 09:00 – 11:00	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	For public participation meetings envisaged in terms of sections 102 and NEMA 2014 Regulations traditional members of the community participate just like any interested and affected party, which could be an NGO or any passerby. This participation is purely for information sharing and not for addressing a clash between rights and interests of mineral rights holder versus surface rights holders. The clash is addressed under appropriately arranged consultation meeting(s) in accordance with the interim procedures under the IPILRA.	All comments during the PP process are noted and presented to the Department for adjudication. This process is therefore not only informative but representative. In this case the process is achieving its purposes which indeed does not include addressing an alleged clash of rights.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	Digby Wells is urged to ensure that members of the villages of Masehlaneng, Masodi, Madiba, Sekgoboko, Kgobudi and Mzombane are provided with transport to the venue.	The venues were chosen in a sufficient number of villages to allow for pedestrians to access the meeting. Various community members arrived with vehicles at the meeting indicating that normal transport opportunities were sufficient.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	There is currently a dispute regarding status of Masehlaneng village as an affected party in the context of operations of the IPILRA. The dispute is brought about by amendment of location of Tailings Storage Facility (TSF) from Turfspriut farm (where Masehlaneng village is located) to Rietfontein farm. Notwithstanding that an appeal lodged against the amendment decision suspends the environmental authorisation and thus approval of location of TSF at Turfspruit is still in force, Ivanplats claims otherwise.	Ivanplats' legal advisors have indicated that Ivanplats never received formal notification that the appeal was accepted by LEDET. It has also not received an invite from LEDET to respond to the appeal and are in the process of investigating the competency of the appeal process followed.	General
Aubrey Langa	Written Comment	13-Mar-16	We are concerned that the EIA public participation process undertaken in 2013 in support of the mining right application was not graced by other statutory stakeholders such as government officials, and non-statutory stakeholders such as reputable NGOs and NPOs. A rich contribution by these entities was therefore missed.	As part of the public participation undertaken in 2013 for the mining right application the statuary stakeholders and NGOs were informed and included into the EIA process, as required by the NEMA. Comments made by these individuals were included in the EIA Report.	Public Participation

Aubrey Langa	Written Comment	13-Mar-16	Nothing that failure by statutory stakeholders to attend or to comment amounts to negligent of statutory obligations, we urge Digby Wells to formally invite the stakeholders so that the culprit is easily identified. This will enable us to follow up on them to perform their constitutional functions. We request that officials of the DMR, the DRDLR, the SAHRA, the LEDET, the DAFF and Mogalakwena Municipality be invited and that the invitations be placed in Digby Wells public documents.	Formal invitations to the relevant statuary Government entities listed have been distributed and followed up with telephonic discussion. Proof is provided under Appendix C5 of the Amendment report.	Public Participation
Aubrey Langa	Written Comment	13-Mar-16	We further request that officials of the Office of the Public Protector and Commission for Religious and Linguistic Rights be invited. The following officials of the two Chapter 9 institutions that are involved in the Ivanplats projects are Mr. Stanley Mingha (073 278 9410) and Adv Sedupane (asedupane@crlcommission.org.za; 082 889 3885).	Formal invitations to the relevant statuary Government entities listed have been distributed and followed up with telephonic discussion. Proof is provided under Appendix C5 of the Amendment report.	Public Participation
Jerry Chabalala	Tshamahansi Tribal Authority Meeting	12-Apr-16	The most recent issue for the community of Tshamahansi is the blasting. People's houses have been cracking because of the blasting. Was there a structural survey done with pictures of houses before the blasting started?	The blasting regulations require that structures need to be surveyed within 500m of the blasting zone. Ivanplats surveyed within a 1000m of the blasting zone. Tshamahansi falls outside this 1000 m zone therefore the houses were not surveyed. Ivanplats can arrange for a blast specialist to speak to the community.	Blasting
Jerry Chabalala	Tshamahansi Tribal Authority Meeting	12-Apr-16	There has also been a foreign smell in the community since the blasting started.	The smell could be caused by a number of sources, none of which would be related to the blasting activities. The blasting which is taking place at the moment is all underground blasting.	Air Quality
Keneth Lebese	Tshamahansi Tribal Authority Meeting	12-Apr-16	Was it said in the presentation that noise will be mitigated during the sinking of the shaft? How will this mitigation take place?	Not only for the sinking of the shaft, but for all the activities of the mine. The mitigation will take form of earth berms around the perimeter of the mine to reduce noise levels from the mine. Further to this, equipment such as waste rock crushers and plant infrastructure will be will have structural enclosures to reduce the noise levels generated.	Noise
Jan Mtjeke	Tshamahansi Tribal Authority Meeting	12-Apr-16	We thought that there would be a blasting survey undertaken of our area as well.	The blasting regulations require that structures need to be surveyed within 500m of the blasting zone. Ivanplats surveyed within a 1000m of the blasting zone. Tshamahansi falls outside this 1000 m zone therefore the houses were not surveyed. Ivanplats can arrange for a blast specialist to speak to the community.	Blasting
Dan Makhubela	Tshamahansi Tribal Authority Meeting	12-Apr-16	Is it possible for the reports to be made available at the three Kgoros for the three Tshamahansi villages? The mobile office is insufficient for making the reports available.	Yes, this can be arranged. Three hard-copies were delivered to the Tshamahansi village.	Public Participation
Chris Maluleke	Tshamahansi Tribal Authority Meeting	12-Apr-16	We are grateful for the responses, we have had our differences with Ivanplats around the surface rights agreements and we are happy that this is also being resolved.	Thank you for the comment, it is welcomed and noted.	General

Thomas Baloyi	Tshamahansi Tribal Authority Meeting	12-Apr-16	Are these engagements with Digby Wells once off or will there be other meetings?	Digby Wells Environmental was appointed as the independent Environmental Assessment Practitioner to undertake this Environmental Amendment Application. The meetings being held are directly linked to the application and are once-off. Should there be a any further Environmental Applications being made, Digby Wells may undertake these and further engagement with the community.	Public Participation
Shimane Kekana	Key Stakeholder Meeting	13-Apr-16	It is unacceptable that Ivanplats chair the meeting and make the presentation. Digby Wells should be independent. Is Digby Wells pro Ivanplats, how can we trust that Digby Wells will be independent?	Digby Wells is an independent Environmental Impact Assessment service provider and is responsible for an independent environmental consultation process. Digby Wells developed the presentation and based on the representatives at the meeting considered it important for the presentation to be undertaken in Sepedi. Digby Wells had a contracted facilitator at the meeting and the Project Manager to address technical questions.	Public Participation
Shimane Kekana	Key Stakeholder Meeting	13-Apr-16	Digby Wells did the Mining Right Application, is Digby Wells and Ivanplats aware that mining needs to stop as Ivanplats is working within an area that has graves and burial grounds.	A HIA as part of the original MR application and EA process identified several graves which required relocation. A Grave Relocation Plan has been developed and this process is being managed by a service provider to Ivanplats. Ivanplats is also working with the South African Heritage Resources Agency (SAHRA) to address the issue of graves. The graves identified as part of the amendment process will be included in the existing grave relocation process. There is also a Chance Find Procedure in place should a grave be identified during any construction activity.	Heritage
Shimane Kekana	Key Stakeholder Meeting	13-Apr-16	On pages 101 and 103 of the Digby Wells Social Impact Assessment it states that communities should be relocated. This was before the settlements grew into the mining right area. Why is the mining area being reduced to accommodate the growth of the communities and communities are not being relocated?	The SIA (2013) states that project design and implementation are conducted in such a way that no physical displacement will be required. The measures proposed were in relation to economic displacement, in particular compensation for the use of grazing and agricultural land. With reference to this, Ivanplats has initiated the development of a Livelihoods and Restoration Plan. Since mine development, the layout has been changed and the area to be used has been reduced to accommodate the growth of the communities as this is the policy and approach adopted by Ivanplats.	Socio-economic - Resettlement
Shimane Kekana	Key Stakeholder Meeting	13-Apr-16	The Bosvelder advertisement mentioned blasting. There have been community complaints about the blasting. What is Ivanplats doing to address these issues?	As required by the blasting regulations, there is a 500m buffer from the surrounding communities and this is currently being maintained. A structural survey was conducted of structures within a 1000m radius if there are structures which have been damaged and it can be proven to be as a result of the blasting these issues will be addressed.	Blasting
Shimane Kekana	Key Stakeholder Meeting	13-Apr-16	The details of the amendment are not being dealt with.	It is unfortunately not possible to address all the details in a presentation or meeting. All the project details are contained in the report, which is available to all project stakeholders for review.	General

Shimane Kekana	Key Stakeholder Meeting	13-Apr-16	We will not allow the meeting to take place at Magongoa until Ivanplats meet with us regarding outstanding issues.	The Company is making various efforts to resolve matters raised by the Community on a continual basis.	General
David	Key Stakeholder Meeting	13-Apr-16	The issues of blasting have not been addressed by Ivanplats.	Concerns relating to the operational aspects of the mining operations can be provided to the Ivanplats Stakeholder Engagement Department (SED). Airblast and vibration is monitored for every blast. Monitoring stations are set up at the four boundaries before every blast.	Blasting
Esau Mabuela	Key Stakeholder Meeting	13-Apr-16	The communities have never agreed on the reports which have been submitted by Digby Wells. How can we trust Digby Wells if we have never agreed to the reports submitted?	Digby Wells is an independent environmental consultancy which has been contracted by Ivanplats to undertake the Environmental Authorisation process and is required to follow the legislated processes as required by NEMA and the MPRDA. The public participation process is undertaken to gather stakeholder comment, including those of all the communities and to provide these, together with appropriate responses, to the relevant authorities. The authorities will use the comments and responses received as part of their decision-making process. Further to this, Digby Wells affords stakeholders the opportunity to verify that their comments have been appropriately captured and responded to by making the final EIA Addendum Report available. If there are any objections to the reports these are provided to the authorities to take into consideration as well.	Public Participation
Bennet Kekana	Key Stakeholder Meeting	13-Apr-16	I have sent emails to Digby Wells without getting a response.	Please can you forward these emails again to the email addresses provided, as these emails have not been received.	Public Participation
Bennet Kekana	Key Stakeholder Meeting	13-Apr-16	In terms of the Stakeholder Forum meetings held with Ivanplats, we have not received feedback on the issues raised.	This has been communicated to Ivanplats and will be addressed through the existing community engagement forums.	General
Bennet Kekana	Key Stakeholder Meeting	13-Apr-16	How far is Ivanplats with the livelihood restoration projects?	This issue will need to be addressed directly to the social engagement department at Ivanplats. The livelihood restoration program has commenced with surveys being conducted in the relevant villages.	Socio-economic
Bennet Kekana	Key Stakeholder Meeting	13-Apr-16	How far is Ivanplats with the lease agreements?	The new lease agreements are being looked at. Ivanplats is working with the Department of Rural Development and Land Reform to get the long term surface lease process underway. At the moment the mine is operating under the old interim agreement.	Socio-economic
Bennet Kekana	Key Stakeholder Meeting	13-Apr-16	In terms of BEE: how much is still owed and was the community consulted in terms of the BEE deal?	The BBBEE deal was completed during 2014 and 26% of the mining development is owned by local black persons. Extensive consultations were done through out the roll-out of the B-BBEE.	General
Bennet Kekana	Key Stakeholder Meeting	13-Apr-16	Ivanplats and the authorities are fraudulent - they made Kgosi Kekana to sign some fraudulent documents.	Comment noted. Ivanplats do deny this.	General

Mpho Tjale	Key Stakeholder Meeting	13-Apr-16	The library is not a good place for the reports as it is difficult to access. Digby Wells needs to engage with the community to make the information available.	Various stakeholder meetings are being undertaken at different time slots and at different venues in an effort to share information about the report. The report is also available on CD, at Ivanplats Mine Security Gate, the SED Mobile Office and at all public meetings.	Public Participation
Mpho Tjale	Key Stakeholder Meeting	13-Apr-16	How many graves have been found and has the whole community been informed about the graves found?	During Phase 1, a number of 94 graves will be moved from the mining area. Certain graves will form part of Phase 2 where the graves register is till in development. This second phase mainly involves areas outside of the mining area required for the tailings facilities.	Heritage
Mpho Tjale	Key Stakeholder Meeting	13-Apr-16	The berm around the mine will obstruct my view of the other surrounding communities.	The berms are required to reduce the noise from the mine and to reduce the visual impact of the mine. The berm is to shield the surrounding communities from the mine activities.	Visual
Mpho Tjale	Key Stakeholder Meeting	13-Apr-16	When will the existing surface right agreement expire?	When the long term surface lease agreement is concluded.	General
Mpho Tjale	Key Stakeholder Meeting	13-Apr-16	Digby Wells has submitted the wrong information - there are many issues which Ivanplats has not addressed with the communities.	Digby Wells needs to undertake an independent EIA process, focusing on the Amendment Application. Concerns relating to legacy issues are important, but needs to be conveyed to the Ivanplats SED.	Public Participation
Mpho Tjale	Key Stakeholder Meeting	13-Apr-16	We don't have a problem with Digby Wells - our issues are with Ivanplats. We propose that the meeting be closed and that Ivanplats comes back to us in a meeting to address all our issues.	Ivanplats continuously engages the community to discuss and resolve issues that may arise.	General
Mr Magiba	Key Stakeholder Meeting	13-Apr-16	What agreement is there with the community to access the land?	The existing surface use agreement allows Ivanplats to access the land.	Land Value / Use and Ownership
Nomsa Magojwa	Key Stakeholder Meeting	13-Apr-16	Magongoa communities own farming land and our forefathers left these lands to us. Ivanplats came and took our lands from us and give us R5 200.00, but Ivanplats is getting billions from the mining.	Ivanplats paid compensation to mealie-field owners in the amount of R5250 per mealie field per ploughing season (i.e. every six months). This amount was paid if the community was unable to utilize their field for ploughing activities. Ivanplats has commenced with a livelihood restoration programme, which will compensate affected community members on a like-for-like basis.	General
Mr Zitha	Key Stakeholder Meeting	13-Apr-16	Section 36 subsection 6 says if there are graves in a project area - operation must stop with immediate effect.	A HIA as part of the original MR application and EA process identified several graves which required relocation. A Grave Relocation Plan has been developed and this process is being managed by a service provider to Ivanplats. Ivanplats is also working with the South African Heritage Resources Agency (SAHRA) to address the issue of graves. The graves identified as part of the amendment process will be included in the existing grave relocation process. There is also a Chance Find Procedure in place should a grave be identified during any construction activity. Should a grave be found, construction will stop until the grave has been relocated. It should further be noted that there is no construction occurring within a 100 m buffer of all known graves and burial grounds.	General

Holly Maponya	Key Stakeholder Meeting	13-Apr-16	Where Ivanplats is proposing to place the mine, there is a culturally-based community.	Thank you for the comment, this has been taken into consideration.	Socio-economic
Holly Maponya	Key Stakeholder Meeting	13-Apr-16	If Ivanplats did not despise culture, they would have known that there are graves in the area.	Ivanplats is aware of the graves and has developed a Grave Relocation Plan. Ivanplats is also working with the South African Heritage Resources Agency (SAHRA) to address the issue of graves. There is also a Chance Find Procedure in place should a grave be identified during the construction process. Should a grave be found, construction will stop until the grave has been relocated. It should further be noted that there is no construction occurring within a 100 m buffer of all known graves and burial grounds.	Heritage
Holly Maponya	Key Stakeholder Meeting	13-Apr-16	Our land is communal, there is no way that Ivanplats will or can talk or negotiate with individuals in terms of fields where the mine will be located. Ivanplats must talk to everybody.	Ivanplats consulted the community widely to the satisfaction of the South African Heritage Resources Agency, The Mogalakwena Municipality and the Waterberg District Municipality which issued permits for the graves relocation process recently.	General
Holly Maponya	Key Stakeholder Meeting	13-Apr-16	Ivanplats have divided the community because they are capitalists.	Your comment is noted.	General
Holly Maponya	Key Stakeholder Meeting	13-Apr-16	We are not aware of the SUCA report Ivanplats is talking about, can we get copy of the report so we can study it?	SUCA documents are available in the four communities that have entered such agreements with Ivanplats. The documents are available at each traditional council.	General
Sello Kekana	Key Stakeholder Meeting	13-Apr-16	Ivanplats is paying the Kgoro R640,000.00 and the community is not getting anything out of that amount.	Ivanplats is paying communities with Surface use co-operation agreements an amount of R15,000 per month in accordance with the agreement. These funds are paid into community accounts.	General
Mfariseni Nelusi	Key Stakeholder Meeting	13-Apr-16	Mining has specific phases that needs to be followed. Planning, mining and decommissioning - Mogalakwena Local Municipality have not received any reports from Ivanplats with regards to all the phases to be followed by Ivanplats.	The Mogalakwena Local Municipality is a key stakeholder involved from project inception. All EIA Reports compiled have been submitted to the municipality for review and comment. In terms of the current phase, Ivanplats has just commenced with construction in 2014 and plan to commence with operations in Quarter 4 of 2019. The EIA Reports compiled do deal with all phases of the project including construction, operation and closure.	General
K A Sedupane	Key Stakeholder Meeting	13-Apr-16	There are number of concerns voiced by the community - there is a lot of miscommunication between the mine and the communities. Time is not on the mine's side, but I advice Ivanplats to go to principals and meet with the communities before proceeding with all the activities.	Comment noted.	General
K A Sedupane	Key Stakeholder Meeting	13-Apr-16	Ivanplats need to focus on the grave process, because public participation has not been done enough.	Comment noted.	General
Mr Makhubela	Tshamahansi Public Meeting	17-Apr-16	The facilitator proceeded with the meeting, we do not know who gave permission to do so.	The process followed for public participation is an independent process and as such, this meeting was communicated to stakeholders and arranged to take place at the time set out, which is 09:00.	Public Participation
Mr Makhubela	Tshamahansi Public Meeting	17-Apr-16	Was the Chief not suppose to talk to the community first to introduce the team.	We acknowledge your comment/concern, but it is noted that the Chief was not present at the meeting.	Public Participation

Mr Makhubela	Tshamahansi Public Meeting	17-Apr-16	The facilitator was too fast, was it not better if he present a slide ask questions and go to the next slide?	There is opportunity for meeting attendees to ask questions about the various slides, which can also be referred back to at any time.	Public Participation
Mr Makhubela	Tshamahansi Public Meeting	17-Apr-16	Will the community be able to access their graves within the mine with regards to heritage and culture?	Yes, community members will be allowed access the mine and given the opportunity to visit heritage sites.	Heritage
Dan Baloyi	Tshamahansi Public Meeting	17-Apr-16	What are the findings of the Amendment Assessment done by Digby Wells for the proposed project especially for Tshamahansi Community?	The findings are presented in the EIA Addendum Report. The proposed amendments do not directly affect the Tshamahansi Community, the amendments do however result in increased visual, noise and dust impacts due to the heights of infrastructure and activities increasing.	Environmental Impact Assessment
Thomas Baloyi	Tshamahansi Public Meeting	17-Apr-16	Who gave a word of welcome to the facilitator as no one introduced him and told him to proceed. The presenter is moving too fast and I suggest that the presenter take questions at the end of each slide.	The process followed for public participation is an independent process and as such, this meeting was communicated to stakeholders and arranged to take place at the time set out, which is 09:00. There is opportunity for meeting attendees to ask questions about the various slides, which can also be referred back to at any time.	Public Participation
Thomas Baloyi	Tshamahansi Public Meeting	17-Apr-16	How will people who are affected in term of heritage and culture (graves onsite) be granted access to the mine site?	Ivanplats is aware of the graves and has developed a Grave Relocation Plan. However, there is a current process that has been communicated to the Next of Kin, that notification to Ivanplats must be provided at least 48 hours prior to such a visit so the necessary arrangements can be made.	Heritage
Thomas Baloyi	Tshamahansi Public Meeting	17-Apr-16	I was aware of the meeting and would like to propose to the chief to select people who will represent the community at these kind of meetings.	There are structures in place between communities and Ivanplats. Also, it is emphasised that the questions should be with regards to the environmental studies undertaken and all stakeholders interested in or affected by the proposed project have the opportunity to partake in the process freely.	Public Participation
Dan Baloyi	Tshamahansi Public Meeting	17-Apr-16	From the presentation it has been mentioned that there are assessments that were undertaken by Digby Wells, what are the findings concerning the community of Tshamahansi?	The findings are presented in the EIA Addendum Report. The proposed amendments do not directly affect the Tshamahansi Community, the amendments do however result in increased visual, noise and dust impacts due to the heights of infrastructure and activities increasing.	Environmental Impact Assessment
Percy Mtileni	Tshamahansi Public Meeting	17-Apr-16	The community needs to form a forum.	Comment noted, thank you.	General
Simon Ngoveni	Tshamahansi Public Meeting	17-Apr-16	Where will waste from the mine be dumped?	As part of the mine infrastructure, various waste management facilities will be developed for the storage and management of waste. In particular, there will be a landfill site for general wastes on site. There will also be a material recovery facility, where it is proposed that wastes will be recycled/re-used to whatever extent possible. Waste management will be in compliance of the National Environmental Management: Waste Act, 2008.	Project Specific
Tshepo Nkwareni	Tshamahansi Public Meeting	17-Apr-16	Community will write down their comments and will email them to Digby Wells with regards to environmental studies.	Thank you for the comment, this is welcomed.	Public Participation
Tshepo Nkwareni	Tshamahansi Public Meeting	17-Apr-16	Community members need to form a committee which will look at skills developments for the community.	Community training and skills development is being done as part of the mine's Social and Labour Plan.	Socio-economic - Training

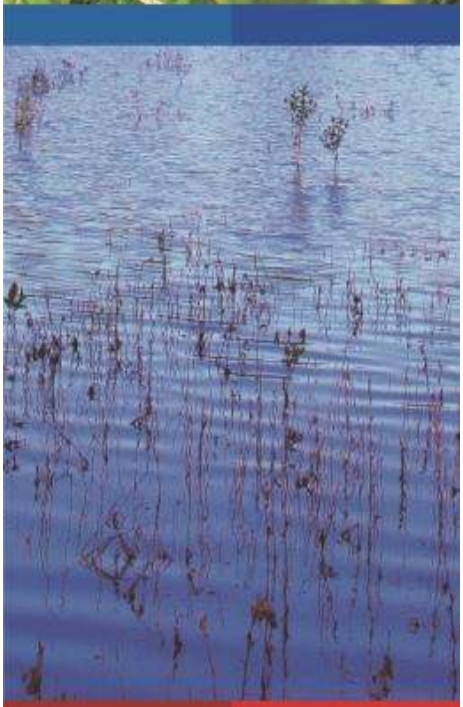
Thabo Nghonyama	Tshamahansi Public Meeting	17-Apr-16	How will the noise emanating from the mine area be controlled?	The mitigation will take form of earth berms around the perimeter of the mine to reduce noise levels from the mine. Further to this, equipment such as waste rock crushers and plant infrastructure will be will have structural enclosures to reduce the noise levels generated.	Noise
Thabo Nghonyama	Tshamahansi Public Meeting	17-Apr-16	I am not aware of anything about the mine and requests that it be rectified.	Comment noted, please engage with the Ivanplats SED.	General
Thabo Nghonyama	Tshamahansi Public Meeting	17-Apr-16	On 2 December 2015 there was blasting at the mine and there was noise coming from the mine, what will be done to reduce the noise?	The mitigation will take form of earth berms around the perimeter of the mine to reduce noise levels from the mine. Further to this, equipment such as waste rock crushers and plant infrastructure will be will have structural enclosures to reduce the noise levels generated. Blast methods are also designed to reduce noise levels. Furthermore, underground blasting will take place to sink the shaft, surface blasting will be limited.	Noise
Uncle Ben	Tshamahansi Public Meeting	17-Apr-16	Digby Wells took people for training and never awarded with the necessary certificates.	Comment noted.	Socio-economic - Training
Uncle Ben	Tshamahansi Public Meeting	17-Apr-16	Ivanplats sends Digby Wells to come and crook the community.	The environmental legislation of South Africa stipulates that an independent company needs to undertake an EIA process, which includes engagement with stakeholders, such as communities. Digby Wells therefore only provides feedback on the specialist studies completed, which includes findings, impacts and proposed mitigation measures.	Environmental Impact Assessment
Frank Macevele	Tshamahansi Public Meeting	17-Apr-16	Other affected communities have trust funds and we want to know whether Tshamahansi has one as well.	There is one trust that was established for the benefit of all the communities surrounding the mine, including Tshamahansi.	General
Frank Macevele	Tshamahansi Public Meeting	17-Apr-16	What will be done regarding the noise coming from the mine?	The mitigation will take form of earth berms around the perimeter of the mine to reduce noise levels from the mine. Further to this, equipment such as waste rock crushers and plant infrastructure will be will have structural enclosures to reduce the noise levels generated.	Noise
Sello Matjeke	Tshamahansi Public Meeting	17-Apr-16	Is there any communication or notices given to communities prior to blasting?	Ivanplats releases periodic notices to inform the community prior to blasting.	Blasting
Sello Matjeke	Tshamahansi Public Meeting	17-Apr-16	Does the mine have an appropriate place to dump their waste?	As part of the mine infrastructure, various waste management facilities will be developed for the storage and management of waste. In particular, there will be a landfill site for general wastes on site. There will also be a material recovery facility, where it is proposed that wastes will be recycled/re-used to whatever extent possible.	Project Specific

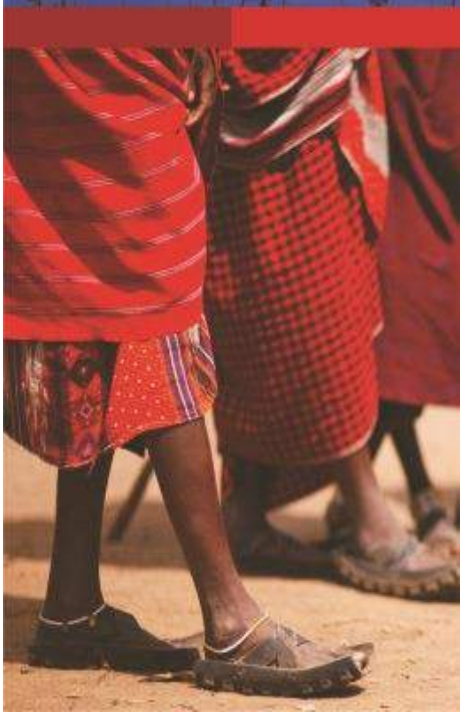
Sello Matjeke	Tshamahansi Public Meeting	17-Apr-16	What developments have been done by Ivanplats so far except building toilets?	To mention a few: The mine provided 146 waterless toilet units to various public schools, the process of identifying qualifying schools was facilitated by the Department of Education. We anticipate to complete the remaining 6 units by end of December 2015. A total of one hundred and thirty (130) waterless sanitation units were installed in thirty six (36) public open spaces of the Magongoa and Kgobudi Villages Three local HDSA Contractors were appointed to implement the project. This project is in line with the needs expressed in the Mogalakwena Municipality's IDP 2012-2016 which recognize inadequate sanitation as an environmental challenge. Provided modern computer laboratories and science laboratories. Mogalakwena District Education Language Competition during final round. Trained Life Orientation Educators The Motshitshi Primary School was provided with curriculum supported science kits for practical lessons Vegetable gardens covered with netting and equipped with irrigation systems. One was equipped with a water borehole Rain water harvesting units were installed at seventy two (72) households in the Magongoa and Kgobudi Villages The process of identifying qualifying vulnerable households was facilitated by both the Traditional Council and the Department of social development. Wooden "wendy" houses were donated and constructed at nineteen (19) community facilities such as clinics, schools and childcare centres The Lesedi Community Centre Renovations project, the old community centre building was refurbished, a new fence was erected around the facility; a water borehole was drilled, as well as sports facilities and a vegetable garden project was established. The facility is in the registration process with the Department	Project Specific
Sello Matjeke	Tshamahansi Public Meeting	17-Apr-16	Youth from the Tshamahansi community are unemployed.	Comment noted.	Socio-economic - Employment
Mr Maluleke	Tshamahansi Public Meeting	17-Apr-16	What will the mine do for people who lose their hearing capabilities due to the noise?	All employees on site wear PPE which mitigates this risk sufficiently. The noise that might be generated by the mine will be within the national limits and will also be monitored. The berm that will be constructed around the mine boundary will further assist in reducing any noise that might be emanate from the mine.	Noise
Sydwell Nkuna	Tshamahansi Public Meeting	17-Apr-16	The meeting is not legit because there is no agenda.	The second slide of the Tsonga PowerPoint presentation provides an agenda for the meeting.	Public Participation
Sydwell Nkuna	Tshamahansi Public Meeting	17-Apr-16	Can the specialists who undertook the work be present at these meetings to answer questions?	The project manager who has been involved with the project from the beginning and is sufficiently equipped to answer any specialist related questions. Should the questions be very technical and specific, the relevant specialist can be requested to provide an answer to you directly.	Environmental Impact Assessment

Sydwell Nkuna	Tshamahansi Public Meeting	17-Apr-16	Has any study with regards to grave re-location been conducted?	Ivanplats is aware of the graves and has developed a Grave Relocation Plan. There is also a Chance Find Procedure in place should a grave be identified during the construction process. Should a grave be found, construction will stop until the grave has been relocated.	Heritage
Sydwell Nkuna	Tshamahansi Public Meeting	17-Apr-16	Why are the artefacts taken to Wits and not the local museum?	There are laws and regulations which stipulates on how these artefacts should be preserved.	Heritage

Appendix D: Addendum Visual Impact Assessment Report







DIGBY WELLS
ENVIRONMENTAL

Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province

Visual Impact Assessment Addendum Report

Project Number:

IVA3396

Prepared for:

Ivanplats (Pty) Ltd

January 2016

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This document has been prepared by Digby Wells Environmental.

Report Type:	**Visual Impact Assessment Addendum Report**
Project Name:	**Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province**
Project Code:	**IVA3396**

Name	Responsibility	Signature	Date
Stephanie Mulder	Report Writer		7 January 2016
Bradly Thornton	Reviewer		7 January 2016
Michael Hennessy	Reviewer		15 January 2016

This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.

EXECUTIVE SUMMARY

Digby Wells Environmental (Digby Wells) has been appointed by Ivanplats (Pty) Ltd (Ivanplats) as the independent Environmental Assessment Practitioner (EAP) to conduct an Amendment Application to the approved Environmental Impact Assessment (EIA), 2013 for the Platreef Project (the Project). This includes the associated specialist studies and the required Public Participation Process (PPP). An Addendum to the approved Visual Impact Assessment (VIA), 2013 has been undertaken and is presented in this report, as part of the Amendment Application Process.

During the site establishment phase of the Platreef Project, the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities established residential plots in close proximity to the mine infrastructure area. The approved mine infrastructure layout had a total footprint area of 419 hectares (ha), which has now been reduced to 345 ha because of these encroachments. Due to the reduction of the mine infrastructure footprint area, by up to 74 ha, Ivanplats has revised the approved mine layout to ensure an optimum use of reduced infrastructure footprint. The key amendments are as follows:

- Headgear – increased in height from 45 m to 96 m;
- Shafts – 2 production shafts and 3 ventilation raises (an additional production shaft has been added and positions of ventilation raises have changed);
- Crushers – inclusion of an aboveground waste rock crusher within the waste rock stockpile area;
- Stockpiling – amendments to the volume, footprints and heights of the stockpiles and the separation of high grade and low grade ore into individual stockpiles;
- TSF pipeline – a section of the pipeline has been re-aligned to follow an existing servitude;
- Repositioning of water management structures including the stormwater dam and attenuation dams; and
- Amendments to the alignment of linear infrastructure including haul roads/internal mine roads and stormwater drains.

Additional activities have also been included as follows:

- Distribution powerlines and substations (< 33 kV); and
- Generation of power using diesel generators (<10 MW).

The Project is located on the Northern Limb of the Bushveld Igneous Complex (BIC). The predominant platinum reef in this area is known as the “Plat Reef”. The project area for the Project is defined as the Mining Right Area (MRA) with particular focus on the mine infrastructure area. The project area and surrounds are characterised by traditional authorities consisting of numerous rural settlements and the associated agricultural land

used for subsistence farming. The Project falls within the Mogalakwena Local Municipality and the Waterberg District Municipality of the Limpopo Province, South Africa. The Project is situated adjacent to the town of Mokopane which borders the project area on the south-east and is approximately 7.8 km south-east of the mine infrastructure area.

The project area is relatively flat with the exception of the mountainous area in the north-eastern corner and several isolated ridges. The topographical model indicates that the elevation of the project area increases from 1 028 metres above mean sea level (m.a.m.s.l.) in the Mogalakwena River floodplain in the south-western corner of the project area to 1 747 m.a.m.s.l. on the ridges in the north-eastern corner of the project area. The relatively flat topography of the project area (majority of slopes are less than 2.8°) will only provide minimal screening of the Project. The mountainous areas to the east and west of the project area will provide screening of the Project to those areas on the opposite sides of the mountains.

The receiving environment is characterised by subsistence agriculture and livestock grazing with little of the natural Bushveld vegetation remaining. The agricultural and natural vegetation will only provide minimal screening of the proposed development.

A viewshed is a geographical area, defined by the topography, within which a particular feature will be visible (Oberholzer, 2005). The theoretical viewshed model for the Project was refined to a practical viewshed model with a buffer of 10 km around the mine infrastructure area and divided into areas that are likely to experience different categories of visual exposure. Due to the nature of the receiving environment it is unlikely that the proposed infrastructure will be visible beyond this 10 km buffer. The practical viewshed model depicts the area from which the Project is likely to be visible. This practical viewshed covers an area of 321.92 km².

The theoretical viewshed model indicates that the Makapan Valley WHS core area will not be visually affected by the Project. Parts of the Makapan Valley WHS buffer will potentially be visually affected by the Project. This visual impact is expected to be minimal as only 27.87 ha of the Makapan Valley WHS buffer falls within the practical viewshed area. There is also likely to be an existing visual impact from the industrial area of Mokpane that already affects this part of the buffer. The Project is therefore, expected to have a minimal visual impact on the buffer and no visual impact on the core area of the Makapan Valley WHS. This visual impact is only as a result of the mine infrastructure area and does not take into account the other Project components (including the TSF) that do not fall within the scope of this Addendum Report.

The practical viewshed model indicates that approximately 32% (1419 ha) of the Witvinger Nature Reserve (4496 ha) will be visually affected by the Project. The majority of this impacted area (1053 ha) falls within the category of potentially low visual exposure while 248 ha and 118 ha fall within the categories of potentially moderate visual exposure and potentially high visual exposure respectively.

The potential visual receptors within the practical viewshed include residents of the villages within 10 km of the mine infrastructure area. Road users on the N11 national route and the

R101 and R518 regional roads within the practical viewshed area are also likely to have views of the Project. The N11 national route is used by tourists travelling through Limpopo and to Botswana and Zimbabwe.

The Project will potentially be visible from the southern portion of the Witvinger Nature Reserve. This area of the nature reserve falls within the categories of potentially high, moderate and low visual exposure. The Project may potentially have a visual impact on the scenic and aesthetic qualities of the Witvinger Nature Reserve as well as the archaeological and cultural sites. This could also affect the tourism potential of the reserve.

The Project will potentially be visible from a small part of the buffer of the Makapan Valley WHS which falls within the category of potentially low visual exposure.

The receiving environment of the Project has a high visual sensitivity as there are highly visible and potentially sensitive areas in the landscape. This is due to the largely rural sense of place of the receiving environment as well as the proximity of numerous villages, the Witvinger Nature Reserve, Glenesk Private Nature Reserve, Rousseau Snyman Private Nature Reserve, H. L. Crause Private Nature Reserve, Percy Fyfe Nature Reserve and the Makapan Valley World Heritage Site (WHS) Buffer to the Project site. The Project has a high visibility and a high visual exposure as it will be visible from a large area and will be dominant in the landscape and clearly noticeable to the viewer. The Project has a medium visual intrusion as it partially fits into the surroundings due to the proximity of the Mokgalakwena Platinum Mine, but will still be clearly noticeable. The receiving environment has a low Visual Absorption Capacity (VAC) because there is little screening by the topography and vegetation.

According to Oberholzer (2005), the Project can be categorised as having a very high visual impact on the receiving environment. This impact could potentially be reduced to a high visual impact if the recommended mitigation measures are implemented. The waste rock berm and waste rock stockpile will have a permanent and irreversible negative visual impact as it was assumed that no backfilling will occur at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.

During the closure phase, the negative impacts can be reduced by implementing various mitigation measures; the most important of these is rehabilitation with the emphasis being on re-contouring the site and reconstructing the surface water and drainage lines. The success of this rehabilitation will influence the overall long term impact of the Project on the topography and visual / aesthetic character of the receiving environment. Refer to the Closure and Rehabilitation Reports, 2016 for further details.

Based on the findings of this VIA only (not taking into account the findings of any other studies), from a visual perspective it is recommended that the Project proceeds provided that the recommended mitigation measures are implemented.

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Plan 7: Theoretical Viewshed Model

Plan 8: Practical Viewshed Model

Plan 9: Makapan Valley WHS Theoretical Viewshed Model

LIST OF ABBREVIATIONS AND ACRONYMS

BIC	Bushveld Igneous Complex
CD: NGI	Chief Directorate: National Geospatial Information
CV	Curriculum Vitae
DEM	Digital Elevation Model
DMR	Department of Mineral Resources
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ELC	European Landscape Convention
EMPr	Environmental Management Programme
GHG	Greenhouse Gas
GIS	Geographic Information System
ha	Hectares
IBA	Important Bird Area
IFC	International Finance Corporation
km	Kilometres
kV	Kilovolt
LEDET	Limpopo Department of Economic Development, Environment and Tourism
m.a.m.s.l.	Metres above mean sea level

m	Metres
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MRA	Mining Right Area
MW	Megawatt
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM: PAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NEM:WA	National Environmental: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
PPP	Public Participation Process
RoM	Run of Mine
SAHRA	South Africa Heritage Resources Agency
T&VIA	Topography and Visual Impact Assessment
TSF	Tailings Storage Facility
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment
WHS	World Heritage Site

1 Introduction

"Visual, scenic and cultural components of the environment can be seen as a resource, much like any other resource, which has a value to individuals, to society and to the economy of the region" (Oberholzer, 2005). A Visual Impact Assessment (VIA) is a specialist study performed to identify the visual impacts, and the significance thereof, of a proposed project on the receiving environment.

This report describes the current visual / aesthetic character of the receiving environment and the expected visual impacts of the proposed Platreef Project (the Project). The impacts are described and rated, and mitigation measures proposed to reduce the negative impacts of the Project.

2 Project Description

2.1 Project Background

Ivanplats (Pty) Ltd (hereafter Ivanplats) intends to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province.

The Project is located on the Northern Limb of the Bushveld Igneous Complex (BIC), approximately 280 km north-east of Johannesburg and 8 km north-west of the town of Mokopane in the Limpopo Province of South Africa. The Project is located on the farms Macalacaskop 243 KR and Turfspruit 241 KR with the construction of a Tailings Storage Facility (TSF) on the farm Rietfontein 2 KS.

Ivanplats is the holder of a Mining Right, issued by the Department of Mineral Resources (DMR) on 04 November 2014 and an Environmental Authorisation, granted by the Limpopo Department of Economic Development, Environment and Tourism (LEDET) on 27 June 2014.

Since the granting of the above-mentioned licences, Ivanplats has commenced with the sinking or development of one of two planned mine production shafts, known as Shaft 1. In addition, certain mine infrastructure has been established to support the sinking of Shaft 1, including the mine's access road, a mine boundary fence and temporary facilities such as workshops and offices.

During the site establishment phase of the Platreef Project, the Ga-Kgobudi and Ga-Kgobudi 2 (Mzombane) communities established residential plots in close proximity to the mine infrastructure area. The approved mine infrastructure layout had a total footprint area of 419 hectares (ha), which has now been reduced to 345 ha because of these encroachments. Due to the reduction of the mine infrastructure footprint area, by up to 74 ha, Ivanplats has revised the approved mine layout to ensure an optimum use of reduced infrastructure footprint.

Any change to the approved mine layout necessitates the requirement for an amendment to the relevant licences, in this case the Environmental Authorisation (12/1/9/2-W32), in terms

of Regulation 31 of the Environmental Impact Assessment (EIA) Regulations, 2014 and the Mining Right (LP30/5/2/2/1/10067MR) in terms of Section 102 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

The activities and infrastructure that are proposed to be amended are listed below. In particular, the volumes, footprints, positions and/or heights of the infrastructure listed below have been amended to accommodate the reduced footprint of the mine infrastructure layout. These key amendments are as follows:

- Headgear – increased in height from 45 m to 96 m;
- Shafts – 2 production shaft and 3 vent raises (an additional production shaft has been added and positions of ventilation raises have changed);
- Crushers – inclusion of an aboveground waste rock crusher within the waste rock stockpile area;
- Stockpiling – amendments to the volume, footprints and heights of the stockpiles and the separation of high grade and low grade ore into individual stockpiles;
- TSF pipeline – a section of the pipeline has been re-aligned to follow an existing servitude;
- Repositioning of water management structures including the stormwater dam and attenuation dams; and
- Amendments to the alignment of linear infrastructure including haul roads/internal mine roads and stormwater drains.

In addition, further detail on the infrastructure has been made available during the Feasibility Study, currently being undertaken, and these details will be included as part of the Amendment Application Process. In addition, other activities have now been included:

- Distribution powerlines and substations (< 33 kV); and
- Generation of power using diesel generators (<10 MW).

It should however be noted that these additional activities do not constitute new listed activities in terms of the EIA Regulations, 2014. All activities listed above have been approved in terms of the EIA Regulations, 2010, or do not trigger the relevant thresholds in the EIA Regulations, 2014, to require a new EIA process. Thus an Amendment Application Process is being undertaken to address the Project amendments.

The change of location of the TSF from the Turfspruit farm to the Rietfontein farm was dealt with in a separate amendment, EA Amendment (30 July 2015). The TSF has therefore been excluded from this Addendum Report.

Digby Wells Environmental has been appointed by Ivanplats to review these amendments and identify and assess any additional impacts that may result from these amendments. This

Visual Impact Assessment (VIA) specialist report therefore serves as an addendum to the existing specialist report compiled for the Project.

The previous VIA assessed the visual impact of the mine infrastructure area and the TSF. Due to the changes in the mine infrastructure area and infrastructure components and heights as well as the exclusion of the TSF from the scope of this study, this VIA assesses the visual impact assessment of the amended mine infrastructure area only. The baseline information has been updated to be more relevant to the mine infrastructure area. Updated viewshed modelling was completed and the project activities applicate to the mine infrastructure area were assessed and rated.

2.2 Terms of Reference

Digby Wells Environmental (Digby Wells) has been appointed by Ivanplats as the independent Environmental Assessment Practitioner (EAP) to conduct the Addendum to the EIA for the Project. This includes the associated specialist studies and the required Public Participation Process (PPP). The environmental considerations for the impact assessment phase of the EIA included a VIA for the Project.

3 Specialist Details

A Declaration of Independence and Curriculum Vitae (CV) are attached in Appendix A and Appendix B respectively.

Stephanie Mulder is Unit Manager of the Geographical Information System (GIS) Unit at Digby Wells. She obtained a BSc Geography and Informatics with Financial Orientation degree and a BSc (Hons) degree in Geography from the University of Johannesburg. Stephanie joined Digby Wells as a GIS Specialist in September 2009 and became Unit Manager of the GIS Unit in July 2012. She is responsible for managing the GIS staff and overseeing all GIS work. Stephanie has experience writing Topography and Visual Impact Assessment (T&VIA) specialist reports. She has experience managing GIS specific projects and has also managed several social survey projects. Stephanie has a strong technical GIS background and has experience using GIS as a digital cartographic and spatial analytical tool.

4 Relevant Legislation

The following international, national and regional documents form part of the legislative and policy framework of the visual assessment.

4.1 International Conventions

The European Landscape Convention (ELC) created by the Council of Europe, was the first international convention to focus exclusively on landscapes. The purpose of this convention is to promote effective management and planning of landscapes. It was signed by the United Kingdom government in 2006 and became binding from 2007. Public documents that

explore the impacts of large scale developments, as defined in the ELC, on any landscape should take into account the effects of these developments. A landscape means “an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors” i.e. the natural, visual and subjectively perceived landscape, (Contesse, 2011; European Landscape Convention, 2007). The ELC is a guideline for this study.

VIAs are relevant to the International Finance Corporation’s (IFC) Performance Standards and this will be treated as a best practice guideline.

IFC Performance Standard 3: Resource Efficiency and Pollution Prevention is applicable to the visual assessment. Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional and global levels. For the purposes of this Performance Standard, the term ‘pollution’ is used to refer to both hazardous and non-hazardous chemical pollutants in the solid, liquid, or gaseous phases, and includes other components such as pests, pathogens, thermal discharge to water, Greenhouse Gas (GHG) emissions, nuisance odours, noise, vibration, radiation, electromagnetic energy and the creation of potential visual impacts including light (IFC, 2012).

The Environmental, Health and Safety Guidelines for Mining therefore need to be considered (World Bank, 2007):

“Mining operations, and in particular surface mining activities, may result in negative visual impacts to resources associated with other landscape uses such as recreation or tourism. Potential contributors to visual impacts include high walls, erosion, discoloured water, haul roads, waste dumps, slurry ponds, abandoned mining equipment and structures, garbage and refuse dumps, open pits, and deforestation. Mining operations should prevent and minimise negative visual impacts through consultation with local communities about potential post-closure land-use, incorporating visual impact assessment into the mine reclamation process. Reclaimed lands should, to the extent feasible, conform to the visual aspects of the surrounding landscape. The reclamation design and procedures should take into consideration the proximity to public viewpoints and the visual impact within the context of the viewing distance. Mitigation measures may include strategic placement of screening materials including trees and use of appropriate plant species in the reclamation phase as well as modification of the placement of ancillary and access roads.”

4.2 National Legislation and Policy

At a national level, the following legislative documents potentially apply to the topography and visual assessment:

- Regulations in Chapter 5 (Integrated Environmental Management) of the NEMA and the Act in its entirety. The Act states that “the State must respect, protect, promote

and fulfil the social, economic and environmental right of everyone…" Landscape is both moulded by, and moulds, social and environmental features;

- Section 23(1)(d) of the MPRDA, where it is mentioned that a mining right will be granted if "the mining will not result in unacceptable pollution, ecological degradation or damage to the environment". Visual pollution is a form of environmental pollution and therefore needs to be considered under this section. Holders of rights granted in terms of the MPRDA must at all times give effect to the general objectives of integrated environmental management laid down in Chapter 5 of the NEMA. The Regulations promulgated in terms of the NEMA, with which holders of rights must comply, provide for the assessment and evaluation of potential impacts, and the setting of management plans to mitigate such impacts;
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and related provincial regulations – in some instances there are policies or legislative documents that give rise to the protection of listed sites. The NHRA states that it aims to promote "good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed for future generations". A holistic landscape whose character is a result of the action and interaction and / or human factors has strong cultural associations as societies and the landscape in which they live are affected by one another in many ways; and
- Section 17 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEM: PAA) sets out the purposes of the declaration of areas as protected areas which includes the protection of natural landscapes. Landscapes are defined by the natural, visual and subjectively perceived landscape; these aspects of a landscape are intertwined to form a holistic landscape context.

5 Aim and Objectives

The aim of this VIA is to determine the nature of the project area and the impact of the Project on the visual / aesthetic character of the surrounding landscape. The following objectives have been identified to achieve this aim:

- Examine aerial photography available for the project area from the Chief Directorate: National Geo-Spatial Information (CD: NGI), 2012, Ivanplats 2013 and Ivanplats, 2015;
- Create and examine topographical, slope intensity, slope aspect and viewshed models in ArcGIS;
- Describe the topography and visual / aesthetic character of the receiving environment;
- Determine the size of the viewshed area;
- Identify potential receptors within the viewshed area;
- Determine the potential visual impacts; and

- Recommend measures to mitigate impacts.

6 Assumptions and Limitations

A VIA is open to subjectivity. This subjectivity is due to the different opinions receptors may have of a proposed project. Oberholzer (2005) defines receptors as “individuals, groups or communities who are subject to the visual influence of a particular project”. A receptor may be partial to the fact that a proposed project is occurring in an area, which becomes a source of economic upliftment for a community, whereas another receptor may view a proposed project as a negative factor which could hamper tourism or recreational activities.

Many factors can enhance or reduce the visual impact of a proposed project. Vegetation near a receptor’s viewpoint can greatly reduce that receptor’s view of a proposed project. Other factors such as weather / climatic conditions and seasonal change can also affect a receptor’s view of a proposed project.

It is, therefore, difficult to determine the visual impact of the Project from the viewpoint, as well as perspective, of each individual receptor. Consequently, this report focuses on the size of the viewshed area as an indication of the significance of the visual impacts of the Project.

Detailed 5 metre contour relief data was not available from the Chief Directorate of National Geo-spatial information for the entire area surrounding the Project. Therefore, the topographical model was created using the available 20 metre contour relief data from CD: NGI. This data is generalised and some of the topography detail is lost. Contour relief data with a resolution of 5 metres or less is required to create more accurate topographical and viewshed models; however, this data was not available for the model area of this Project.

Some infrastructure heights were not available for this study and assumptions were made. These assumptions were based on the heights of infrastructure from similar projects (Table 5, Section 8.3).

A site visit was not conducted for this addendum visual study but extensive field work was done during 2013 for the initial VIA for the Project.

7 Project Area

The Project is located on the Northern Limb of the Bushveld Igneous Complex (BIC). The predominant platinum reef in this area is known as the “Plat Reef”. The project area is defined as the Mining Right Area (MRA) (as approved by the DMR, described in Section 2) with particular focus on the mine infrastructure area. The MRA has been approved and this Addendum Report focuses on the mine infrastructure area (345 ha) within the MRA. The project area and surrounds are characterised by traditional authorities consisting of numerous rural settlements and the associated agricultural land used for subsistence farming. Plan 1 (Appendix C) illustrates the regional setting of the project area.

The Project falls within the Mogalakwena Local Municipality and the Waterberg District Municipality of the Limpopo Province, South Africa. The Project is situated adjacent to the town of Mokopane which borders the project area on the south-east and is approximately 7.8 km south-east of the mine infrastructure area. The mine infrastructure area is adjacent to the villages of Baloi, Ga-Kgobudi, Ga-Sekgoboko, Ga-Magongoa and Ga-Kgobudi 2 (Mzombane). Other villages within 10 km of the mine infrastructure area include but are not limited to: Ga-Machikiri, Ga-Mmalepeteke, Ga-Mokaba, Ga-Molekana, Hlonguane, Macheke, Ga-Madiba, Mahwelereng, Maroteng, Masehlaneng, Masodi, Michelle, Moshate, Mountain View, Parkmore, Pholar Park, Pholotsi Ga-Mabusele, Pholotsi Ga-Masenya, Sandsloot and Sekgakgapeng.

The residential areas and road users in the project area and surrounds are all potential visual receptors of the Project. The closest towns and settlements, as well as their direct distance from the project area and mine infrastructure area and direction from the mine infrastructure area are summarised in Table 1. All distances are straight line distances measured from the edge of the boundary fence / infrastructure area to the edge of the towns / settlements.

Table 1: Closest Towns and Settlements

Name	Type	Direct Distance from Project Area	Direct Distance from Mine Infrastructure Area	Direction from Mine Infrastructure Area
Ga-Kgobudi	Settlement	Within project area	5 m	W
Ga-Magongoa	Settlement	Within project area	5 m	NE
Ga-Kgobudi 2 (Mzombane)	Settlement	Within project area	5 m	S
Ga-Sekgoboko	Settlement	Within project area	40 m	W
Baloi	Settlement	Within project area	65 m	E
Macheke	Settlement	Within project area	475 m	E
Hlonguane	Settlement	Within project area	1.3 km	E
Ga-Mokaba	Settlement	1.2 km	1.6 km	N
Masodi	Settlement	Within project area	2.2 km	S
Ga-Madiba	Settlement	Within project area	2.4 km	SE

Name	Type	Direct Distance from Project Area	Direct Distance from Mine Infrastructure Area	Direction from Mine Infrastructure Area
Ga-Mmalepeteke	Settlement	1.6 km	2.5 km	W
Mahwelereng	Settlement	Within project area	4.4 km	SE
Masehlaneng	Settlement	Within project area	4.6 km	S
Maroteng	Settlement	Within project area	5.0 km	S
Ga-Machikiri	Settlement	1.7 km	5.0 km	N
Mountain View	Settlement	Within project area	5.2 km	S
Moshate	Settlement	Within project area	5.7 km	S
Pholar Park	Settlement	Within project area	6.9 km	SSE
Michelle	Settlement	Within project area	7.1 km	SSE
Parkmore	Settlement	Within project area	7.5 km	SSE
Sekgakgapeng	Settlement	Within project area	7.9 km	S
Pholotsi-Mabusela	Settlement	5.1 km	5.6 km	NW
Pholotsi-Masenya	Settlement	6.0 km	6.3 km	NW
Sandsloot	Settlement	6.3 km	6.8 km	NW
Mokopane	Secondary Town	65 m	7.8 km	SE
Ga-Molekana	Settlement	4.4 km	8.0 km	N

The N11 national route runs in a north-south direction through Mokopane and the project area and is adjacent to the mine infrastructure area. The N1 national route is situated 7.3 km south-east of the project area and 14.3 km south-east of the mine infrastructure area. These national routes are both used by tourists travelling through Limpopo and to Botswana and Zimbabwe. The R518 regional road runs in an east-west direction through Mokpane and the project area, 3 km south of the mine infrastructure area.

The project area and surrounds consist of numerous rural settlements and the associated agricultural land is used for subsistence farming interspersed with areas of natural Bushveld that are typically used for livestock grazing. These natural Bushveld areas have become degraded by over-grazing and the dumping of waste. The only operational mine in the area is the Anglo Platinum Mogalakwena Platinum Mine situated approximately 4.8 km north-west of the project area. The receiving environment can be described as having a rural sense of place. Plan 2 (Appendix C) illustrates the local setting of the project area.

The project area covers an area of 10 686 ha and the coordinates of the centre of the project area are 24° 06’ 35.344” S and 28° 58’ 27.467” E. The mine infrastructure area is situated on the farm Turfspruit 241 KR (Plan 3, Appendix C).

The project area falls within the Limpopo River Catchment Area. The Nyl River flows into the Mogalakwena River just south of the project area. The Mogalakwena River flows through the south-western part of the project area and has a wide floodplain. Numerous tributaries of the Mogalakwena River drain the project area in a westerly direction. These include the Klein-Sandsloot, Dithokeng, Rooisloot, Dorps and Ngwaditse Streams. Soil erosion is evident along these drainage lines and attention must be paid to the management of the activities that affect the topography so as to prevent further soil erosion.

Protected areas such as nature reserves, and recreational and tourism areas are considered sensitive visual receptors. The nearest Important Bird Area (IBA) is the Waterberg System situated 4.4 km west of the project area. The Nyl River Floodplain IBA is situated 13.6 km south of the project area.

The protected areas identified from South African Protected Areas Database (Department of Environmental Affairs, 2015) that are within 20 km of the Project, as well as their direct distance from the project area and mine infrastructure area and direction from the mine infrastructure area are summarised in Table 2. All distances are straight line distances measured from the edge of the project area / infrastructure area to the edge of the protected area.

Table 2: Protected Areas

Name	Type	Direct Distance from Project Area	Direct Distance from Mine Infrastructure Area	Direction from Mine Infrastructure Area
Witvinger Nature Reserve	Nature Reserve	0 m	4.0 km	NE
Fossil Hominid Sites of SA: Makapan Valley (Buffer)	World Heritage Site	2.8 km	9.7 km	SE
Glenesk Private Nature Reserve	Nature Reserve	5.9 km	11.3 km	SE

Name	Type	Direct Distance from Project Area	Direct Distance from Mine Infrastructure Area	Direction from Mine Infrastructure Area
Rousseau Snyman Private Nature Reserve	Nature Reserve	8.9 km	12.4 km	WSW
H. L. Crause Private Nature Reserve	Nature Reserve	5.8 km	12.6 km	ENE
Percy Fyfe Nature Reserve	Nature Reserve	8.0 km	15.2 km	NE
Fossil Hominid Sites of SA: Makapan Valley (Core)	World Heritage Site	14.1 km	18.8 km	ESE
Nyl Valley Private Nature Reserve	Nature Reserve	12.0 km	22.1 km	S
Webtex Estates Private Nature Reserve	Nature Reserve	13.7 km	23.7 km	S
Palmer Private Nature Reserve	Nature Reserve	14.2 km	23.7 km	SSE
Mogoto Private Nature Reserve	Nature Reserve	19.4 km	24.2 km	ESE
Doornfontein Private Reserve	Nature Reserve	16.7 km	25.5 km	SE
Naboom Private Nature Reserve	Nature Reserve	17.3 km	27.3 km	SSW
Doelen Private Nature Reserve	Nature Reserve	19.7 km	29.5 km	SSE
Somerset Private Nature Reserve	Nature Reserve	19.7 km	29.5 km	SSE

The Makapan Valley WHS is an “extension to the Fossil Hominid sites of South Africa” (Government of the Republic of South Africa, 2007). The core area is situated 14.1 km east of the project area and 18.8 km east-south-east of the mine infrastructure area. The Makapan Valley WHS caves and other sites of archaeological and paleontological interest are situated on the farm Makapansgat 39 KS. The South African Heritage Resources Agency (SAHRA) requested that the possible impact (including the potential visual impact) of the Project on the WHS be assessed.

8 Methodology

The VIA was performed using surveyed geographically referenced information and aerial photography, together with the professional opinion of an experienced visual impact assessor.

A study was conducted to identify and evaluate the surface features using ArcGIS 3D Analyst Extension to create a topographical model, and the resultant slope intensity, slope aspect and viewshed models. A topographical or digital elevation model (DEM) is a 3D representation of a terrain's surface. A slope intensity model indicates the slope gradient and a slope aspect model indicates the slope direction. A viewshed is a geographical area, defined by the topography, within which a particular feature will be visible (Oberholzer, 2005). A viewshed model illustrates the areas from which a development will potentially be visible.

8.1 Categorisation of Visual Impacts

The expected visual impact of the Project was categorised based on the type of receiving environment and the type of development as detailed in Table 3 (Oberholzer, 2005). This table provides an indication of the visual impacts that can be expected for different types of developments in relation to the nature of the receiving environment. Following the classification system of Oberholzer (2005), the Project is classed as a **Category 5 development** (Table 4). The receiving environment can be described as having **high scenic, cultural or historical significance** due to the proximity of the Witvinger Nature Reserve, Glenesk Private Nature Reserve, Rousseau Snyman Private Nature Reserve, H. L. Crause Private Nature Reserve, Percy Fyfe Nature Reserve and the Makapan Valley WHS Buffer to the Project. It is therefore expected that the Project will have a **very high visual impact** on the receiving environment. This will be verified in the investigation to follow.

Table 3: Categorisation of Expected Visual Impact (adapted from Oberholzer, 2005)

Type of Environment	Type of Development (Low to High Intensity)				
	Category 1 Development	Category 2 Development	Category 3 Development	Category 4 Development	Category 5 Development
Protected / wild areas of international, national or regional significance	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected	Very high visual impact expected
Areas or routes of high, scenic, cultural or historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	**Very high visual impact expected**

Type of Environment	Type of Development (Low to High Intensity)				
	Category 1 Development	Category 2 Development	Category 3 Development	Category 4 Development	Category 5 Development
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected
Areas or routes of low scenic, cultural or historical significance	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites / run down urban areas / wasteland	Little or no visual impact expected. Possible benefits	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

Table 4: Key to Categorisation of Development (adapted from Oberholzer, 2005)

Type of Development	Examples of Development
Category 1	Nature reserves, nature related recreation, camping, picnicking, trails and minimal visitor facilities.
Category 2	Low-key recreation / resort / residential type development, small-scale agriculture / nurseries, narrow roads and small-scale infrastructure.
Category 3	Low density resort / residential type development, golf or polo estates, low to medium-scale infrastructure.
Category 4	Medium density residential development, sports facilities, small-scale commercial facilities / office parks, one-stop petrol stations, light industry, medium-scale infrastructure.
Category 5	High density township / residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. **Quarrying and mining activities with related processing plants.**

8.2 Visual / Aesthetic Character and Topography

A desktop study was conducted to evaluate the topography of the receiving environment and CD: NGI aerial photography (flown in 2012) and Ivanplats aerial photography (flown in 2013 and 2015) of the project area was examined to determine the relevant surface features. Available vector GIS data was used to determine the relative location of the features surrounding the project area.

A topographical model (Plan 4, Appendix C) was created using ArcGIS 3D Analyst Extension. The model was created using the 20 metre contour relief data available from CD: NGI.

The resultant topographical model was then used to create slope intensity (Plan 5, Appendix C) and slope aspect (Plan 6, Appendix C) models using the Slope and Aspect tools of ArcGIS 3D Analyst Extension. The slope model indicates the slope degree and was classified using the Jenks Natural Breaks method.

8.3 Viewshed Analysis

The resultant topographical model was used to create a viewshed model using the Viewshed Tool of the ArcGIS 3D Analyst Extension. This viewshed model illustrates the areas from which the Project will potentially be visible, taking into account the estimated height of the proposed infrastructure (Table 5). Some infrastructure heights were not available for this study and assumptions were made. These assumptions were based on the heights of infrastructure from similar projects and are indicated in Table 5. The viewshed modelling tool does not model negative infrastructure heights, thus all below ground level infrastructure (culverts, drains and sumps) has been modelled with a height of 0 metres. The infrastructure listed in Table 5 is illustrated on Plan 3 (Appendix C).

Table 5: Infrastructure Heights for Viewshed Modelling

Infrastructure	Height	Source
Shaft 1 and Shaft 2 Headgear	96 m	Provided
Shaft 1 and Shaft 2 Winder Houses	50 m	Assumed
Conveyors	35 m	Provided
RoM Tip	35 m	Assumed
Plant Infrastructure (Ball Loading, Blowers, Cleaners, Concentrate Filtration and Thickening, Milling, Pre Conditioning, Reagents, Roughers, Scavenger Cleaners and Tailings Thickener)	30 m	Provided
Shaft Infrastructure	30 m	Provided
High Grade Ore Stockpile	25 m	Provided
Low Grade Ore Stockpile	25 m	Provided

Infrastructure	Height	Source
Waste Rock Stockpile	25 m	Provided
Crushing and Screening	20 m	Provided
Offices, Stores, Washbays, Workshops	12 m	Provided
Eskom Substations	10 m	Assumed
Overhead Power Lines	10 m	Assumed
RoM Stockpile	10 m	Assumed
Waste Rock Berms	10 m	Provided
Buildings	5 m	Assumed
Core Yard	5 m	Assumed
CRF Crushed Rock Stockpile	5 m	Assumed
Landfill and Cover Material	5 m	Provided
Sewage Treatment Plant	5 m	Assumed
Water Treatment Plants	5 m	Assumed
Concrete Wall	4 m	Already constructed
Berm	3 m	Assumed
Fuel Infrastructure	3 m	Assumed
Walkways	3 m	Assumed
Substations	3 m	Assumed
Vent Raises	3 m	Assumed
Compost facility	2 m	Assumed
Domestic Waste Yard	2 m	Assumed
Pump Stations and Booster Pump	2 m	Assumed
Water Tanks	2 m	Assumed
Dams and Ponds	1 m	Assumed
Pipelines (including TSF pipeline)	1 m	Assumed
Culvert	0 m	Assumed
Roads and Parking	0 m	Assumed
Sumps	0 m	Assumed
Yards	0 m	Assumed

The concept of viewshed modelling is depicted in Figure 1. The topography denotes whether or not a development will be visible from a receptor. In Figure 1 below the development is only visible from the receptors within the valley and on the slopes of the hills facing it. The development will be hidden from all receptors beyond the first hills.

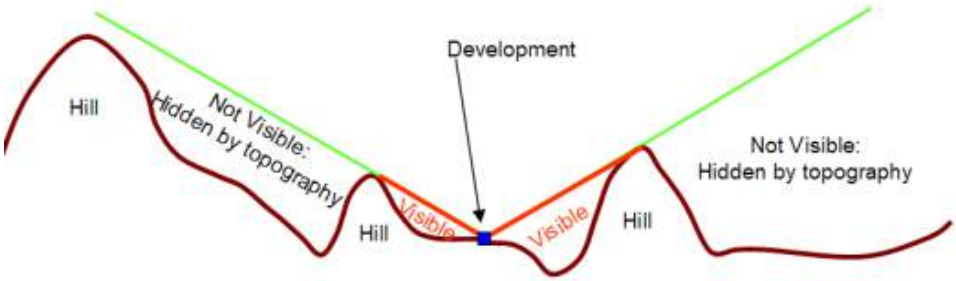


Figure 1: Theoretical background of viewshed modelling

Both a theoretical viewshed model and a practical viewshed model were created. These viewshed models are based on the topography only and do not take the screening effect of vegetation into account. The natural Bushveld vegetation has been transformed by subsistence agriculture and livestock grazing and little natural vegetation remains. Thus the vegetation of the project area and surrounds is not expected to provide noticeable screening of the proposed development.

The theoretical viewshed model, based only on topographical screening, was then refined into a practical viewshed model by dividing the viewshed area into areas that are likely to experience different categories of visual exposure. Visual exposure and the visual impact of a development diminishes exponentially with distance (Oberholzer, 2005).

The findings of a recent site visit for a nearby proposed mining project were used to determine these categories. Photographs were taken of the existing Anglo Platinum Mogalakwena Platinum Mine to determine the visibility of a similar mining project within a similar receiving environment. Figure 2 illustrates that the dumps of the Anglo Platinum Mogalakwena Platinum Mine are clearly visible from a distance of approximately 4.5 km. In Figure 3 the Anglo Platinum Mogalakwena Platinum Mine is just noticeable at a distance of approximately 8.3 km from where the photograph was taken. It is noted that after 10 km the visual exposure is negligible. These photographs were taken during the daytime with clear conditions.

The following categories were thus created for the practical viewshed model:

- 0 – 5 km: Potentially high visual exposure;
- 5 – 8 km: Potentially moderate visual exposure; and
- 8 – 10 km: Potentially low visual exposure.



Figure 2: View of the Anglo Platinum Mogalakwena Platinum Mine from 4.5 km



Figure 3: View of the Anglo Platinum Mogalakwena Platinum Mine from 8.3 km

9 Findings

9.1 Visual / Aesthetic Character and Topography

This section provides the results obtained from the analysis of the topographical, slope and aspect models created in ArcGIS. The project area is situated in the Mogalakwena River valley. Mountainous areas run to the east and west of the project area (Figure 4). The project area is relatively flat with the exception of the mountainous area in the north-eastern corner and several isolated ridges. Ridges are known to create a multitude of unique habitats for both faunal and floral species increasing the expected biodiversity of the area. Ridges also have significant cultural value as historical settlements were located on ridges for safety and strategic advantage. The land within the project area is mainly used for agricultural activities and livestock grazing (Figure 5 and Figure 6).



Figure 4: View across the flat topography of the project area towards the mountainous regions in the west



Figure 5: Agricultural activities



Figure 6: Livestock grazing

The topographical model indicates that the elevation of the project area increases from 1 028 metres above mean sea level (m.a.m.s.l.) in the Mogalakwena River floodplain in the south-western corner of the project area to 1 747 m.a.m.s.l. on the ridges in the north-eastern corner of the project area. Plan 4 (Appendix C) illustrates the topographical model and features of the project area. The relatively flat topography of the project area (majority of slopes are less than 2.8°) will only provide minimal screening of the Project (Plan 5, Appendix C). The mountainous areas to the east and west of the project area will provide screening of the Project to those areas on the opposite sides of the mountains.

According to Mucina and Rutherford (2012) the dominant vegetation types of the proposed project area and surrounds is Makhado Sweet Bushveld with isolated areas of Waterberg-Magaliesberg Summit Sourveld and Waterberg Mountain Bushveld on the eastern mountainous area and Mamabolo Mountain Bushveld and Polokwane Plateau Bushveld on the western mountainous area. The vegetation of the project area is a mixture of agriculture with isolated large trees and areas of degraded natural vegetation. The natural vegetation consists of grass and scattered small bushes and aloes. The average vegetation height in these areas is 1 metre.

The natural vegetation on the western side of the project area is very sparse (Figure 7) while the natural vegetation on the eastern side of the project area tends to be denser (Figure 8). Much of the area has been transformed by subsistence agriculture and livestock grazing and little natural vegetation remains. The agricultural and natural vegetation will only provide minimal screening of the proposed development. This minimal screening is illustrated in Figure 9 where the drill rigs used for exploration (circled in red) are visible in the distance.



Figure 7: Sparse degraded vegetation on the western side of the project area



Figure 8: Denser natural vegetation on the eastern side of the project area



Figure 9: Drill rigs visible looking north-west from the N11 national route (circled in red)

9.2 Viewshed Model

The theoretical viewshed model for the Project is illustrated in Plan 7 (Appendix C). This model was refined to a practical viewshed model (Plan 8, Appendix C) with a buffer of 10 km around the mine infrastructure area and divided into areas that are likely to experience different categories of visual exposure. Due to the nature of the receiving environment it is unlikely that the proposed infrastructure will be noticeable beyond this 10 km buffer. The

practical viewshed model depicts the area from which the Project is likely to be visible. This practical viewshed covers an area of approximately 321.92 km². The viewshed areas for the categories are listed in Table 6 below.

Table 6: Viewshed Area per Category

Category	Impact	Viewshed Area
0 – 5 km	Potentially High Visual Exposure	118.58 km²
5 – 8 km	Potentially Moderate Visual Exposure	120.71 km²
8 – 10 km	Potentially Low Visual Exposure	82.63 km²

The theoretical viewshed model indicates that the Makapan Valley WHS core area will not be visually affected by the Project. Parts of the Makapan Valley WHS buffer will potentially be visually affected by the Project (Plan 9, Appendix C). This visual impact is expected to be minimal as only 27.87 ha of the Makapan Valley WHS buffer falls within the practical viewshed area. There is also likely to be an existing visual impact from the industrial area of Mokpane that already affects this part of the buffer. The Project is therefore, expected to have a minimal visual impact on the buffer and no visual impact on the core area of the Makapan Valley WHS. This visual impact is only as a result of the mine infrastructure area and does not take into account the other Project components (including the TSF) that do not fall within the scope of this Addendum Report.

The practical viewshed model indicates that approximately 32% (1419 ha) of the Witvinger Nature Reserve (4496 ha) will be visually affected by the Project. The majority of this impacted area (1053 ha) falls within the category of potentially low visual exposure while 248 ha and 118 ha fall within the categories of potentially moderate visual exposure and potentially high visual exposure respectively.

9.3 Sensitive Receptors

The potential visual receptors within the practical viewshed include residents of the villages within 10 km of the mine infrastructure area. The villages in each category are listed in Table 7 below.

Table 7: Villages per Category

Category	Village
0 – 5 km: Potentially High Visual Exposure	▪ Baloi ▪ Ga-Kgobudi ▪ Ga-Machikiri ▪ Ga-Mmalepeteke ▪ Ga-Mokaba ▪ Ga-Sekgoboko ▪ Hlonguane ▪ Macheke ▪ Ga-Madiba ▪ Ga-Magongoa ▪ Mahwelereng ▪ Masehlaneng ▪ Masodi ▪ Ga-Kgobudi 2 (Mzombane)
5 – 8 km: Potentially Moderate Visual Exposure	▪ Maroteng ▪ Michelle ▪ Moshate ▪ Mountain View ▪ Parkmore ▪ Pholar Park ▪ Pholotsi Ga-Mabusela ▪ Pholotsi Ga-Masenya ▪ Sandsloot ▪ Sekgakgapeng
8 – 10 km: Potentially Low Visual Exposure	▪ Mokopane

The Project will potentially be visible from the southern portion of the Witvinger Nature Reserve. This area of the nature reserve falls within the categories of potentially high, moderate and low visual exposure. While developing a protected area management plan for the Witvinger Nature Reserve, NCC Environmental Services described the key opportunities of the reserve as follows:

- "The reserve has a high potential as a niche tourist destination (rugged hiking and pristine wilderness);
- The pristine environment provides unique research potential;
- Several attractive faunal species occur in the reserve, including a breeding pair of Black Eagle; Leopard; African Bullfrog; and Red Rock Rabbit, as well as 16 species of bats;
- Proximity to urban environments makes the reserve highly suitable as a day visitor destination;

- The reserve contains good habitat for breeding Sable Antelope and Tsessebe;
- The reserve has several interesting archaeological sites and a mountain (Tsotsoli) of high cultural significance;
- The reserve has pristine wilderness areas and outstanding scenic and aesthetic qualities; and
- The Machikiri Communal Property Association has plans to build a lodge facility very close to the reserve".

The Project may potentially have a visual impact on the scenic and aesthetic qualities of the Witvinger Nature Reserve as well as the archaeological and cultural sites. This could also affect the tourism potential of the reserve.

The Project will potentially be visible from a small part of the buffer of the Makapan Valley WHS which falls within the category of potentially low visual exposure.

Road users on the N11 national route (Figure 10) and the R101 and R518 regional roads within the practical viewshed area are also likely to have views of the Project. The N11 national route is used by tourists travelling through Limpopo and to Botswana and Zimbabwe.

Existing mines and associated mining infrastructure have not been considered as visual receptors.



Figure 10: N11 national route running through the project area

10 Discussion

It is determined that the Project will have a negative visual impact on the aesthetic quality of the receiving environment, even though some receptors may see it as a positive economic development. The greatest visual impact will be from the Shaft 1 and Shaft 2 headgear, shaft infrastructure, plant infrastructure, high grade ore stockpile, low grade ore stockpile and waste rock stockpiles and berms. This is due to the height and / or large footprint area of these components of the infrastructure. The construction of other smaller surface infrastructure will have a lesser visual impact.

10.1 Visibility of the Project

The visibility of the project refers to the viewshed area. The visibility of the project is also related to the number of receptors affected. The Project has a **high visibility** as it is visible from a large area (practical viewshed of approximately 321.92 km²) with numerous visual receptors.

10.2 Visual Exposure

Visual exposure is “based on the distance from the infrastructure area to selected viewpoints” and “tends to diminish exponentially with distance” (Oberholzer, 2005). The Project has a **high exposure** as it will be dominant in the landscape and clearly noticeable to the viewer. This is due to the height and / or large footprint area of the Shaft 1 and Shaft 2 headgear, shaft infrastructure, plant infrastructure, high grade ore stockpile, low grade ore stockpile and waste rock stockpiles and berms.

10.3 Visual Sensitivity of the Area

The visual sensitivity of the area refers to “the inherent visibility of the landscape, usually determined by a combination of topography, landform, vegetation cover and settlement pattern” (Oberholzer, 2005). The receiving environment of the Project has a **high visual sensitivity** as there are highly visible and potentially sensitive areas in the landscape. This is due to the largely rural sense of place of the receiving environment as well as the proximity of numerous villages, the Witvinger Nature Reserve, Glenesk Private Nature Reserve, Rousseau Snyman Private Nature Reserve, H. L. Crause Private Nature Reserve, Percy Fyfe Nature Reserve and the Makapan Valley WHS Buffer to the Project.

10.4 Visual Sensitivity of the Receptors

The visual sensitivity of receptors is dependent on the nature of the receptors. Receptors in residential areas or nature reserves have a high sensitivity while receptors in industrial or mining areas have a low sensitivity. The identified receptors (residents of the villages within 10 km of the mine infrastructure area and road users) of the Project have a **high sensitivity** as they consist of residential areas. The Makapan Valley WHS buffer and the Witvinger Nature Reserve are also sensitive receptors of the Project.

10.5 Visual Absorption Capacity (VAC)

The visual absorption capacity (VAC) refers to "the potential of the landscape to conceal the proposed project" (Oberholzer, 2005). The receiving environment of the Project has a **low VAC** because there is little screening by the topography and vegetation.

10.6 Visual Intrusion

The visual intrusion of the project refers to "the level of compatibility or congruence of the project with the particular qualities of the area, or its sense of place". Visual intrusion is "related to the idea of context and maintaining the integrity of the landscape or townscape" (Oberholzer, 2005). The Project has a **medium visual intrusion** as it partially fits into the surroundings due to the proximity of the Mokgalakwena Platinum Mine, but will still be clearly noticeable.

11 Impact Assessment

11.1 Assessment Methodology

The impacts are assessed based on the impact's magnitude as well as the receiver's sensitivity, culminating in an impact significance which identifies the most important impacts that require management.

Based on international guidelines and South African legislation, the following criteria are taken into account when examining potentially significant impacts:

- Nature of impacts (direct / indirect, positive / negative);
- Duration (short / medium / long-term, permanent (irreversible) / temporary (reversible), frequent / seldom);
- Extent (geographical area, size of affected population / habitat / species);
- Intensity (minimal, severe, replaceable / irreplaceable);
- Probability (high / medium / low probability); and
- Possibility to mitigate, avoid or offset significant adverse impacts.

Details of the impact assessment methodology used to determine the significance of physical, bio-physical and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

Significance = Consequence x Probability x Nature

Where

Consequence = Intensity + Extent + Duration

And

Probability = Likelihood of an impact occurring

And

Nature = Positive (+1) or negative (-1) impact

Note: In the formula for calculating consequence, the type of impact is multiplied by +1 for positive impacts and -1 for negative impacts

The matrix calculates the rating out of 147, whereby Intensity, Extent, Duration and Probability are each rated out of seven as indicated in Table 8. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation measure proposed in this EIA / EMP Report. The significance of an impact is then determined and categorised into one of eight categories, as indicated in Table 9, which is extracted from Table 8. The description of the significance ratings are discussed in Table 10.

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, i.e. there may already be certain types of mitigation measures included in the design (for example due to legal requirements). If the potential impact is still considered too high, additional mitigation measures are proposed.

Table 8: Impact Assessment Parameter Ratings

Rating	Intensity		Extent	Duration / Reversibility	Probability
	Negative Impacts	Positive Impacts			
7	Irreplaceable damage to highly valued items of great natural or social significance or complete breakdown of natural and / or social order.	Noticeable, on-going natural and / or social benefits which have improved the overall conditions of the baseline.	International The effect will occur across international borders.	Permanent The impact is irreversible, even with management, and will remain after the life of the project.	Definite There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability
6	Irreplaceable damage to highly valued items or natural or social significance or breakdown of natural and / or social order.	Great improvement to the overall conditions of a large percentage of the baseline.	National Will affect the entire country.	Beyond Project Life The impact will remain for some time after the life of the project and is potentially irreversible even with management.	Almost Certain / Highly Probable It is most likely that the impact will occur. < 80% probability
5	Very serious widespread natural and / or social baseline changes. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	Province / Region Will affect the entire province or region.	Project Life (> 15 years) The impact will cease after the operational life span of the project and can be reversed with sufficient management.	Likely The impact may occur. < 65% probability

Rating	Intensity		Extent	Duration / Reversibility	Probability
	Negative Impacts	Positive Impacts			
4	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	Average to intense natural and / or social benefits to some elements of the baseline.	Municipal Area Will affect the whole municipal area.	Long Term 6-15 years and the impact can be reversed with management.	Probable Has occurred here or elsewhere and could therefore occur. < 50% probability
3	On-going natural and / or social issues. Discernible changes to natural or social baseline.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	Local Extending only as far as the development site area.	Medium Term 1-5 years and the impact can be reversed with minimal management.	Unlikely Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur. < 25% probability
2	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	Low positive impacts experienced by a small percentage of the baseline.	Limited Limited to the site and its immediate surroundings.	Short Term Less than 1 year and is reversible.	Rare / Improbable Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures. < 10% probability

Rating	Intensity		Extent	Duration / Reversibility	Probability
	Negative Impacts	Positive Impacts			
1	Minimal natural and / or social impacts, low-level replaceable damage with no change to the baseline.	Some low-level natural and / or social benefits felt by a very small percentage of the baseline.	Very Limited Limited to specific isolated parts of the site.	Immediate Less than 1 month and is completely reversible without management.	Highly Unlikely / None Expected never to happen. < 1% probability

Table 9: Probability/Consequence Matrix

Probability	Significance																																						
7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	-21	**-20**	**-19**	**-18**	**-17**	**-16**	**-15**	**-14**	**-13**	**-12**	**-11**	**-10**	**-9**	**-8**	**-7**	**-6**	**-5**	**-4**	**-3**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Consequence																																						

Table 10: Significance Rating Description

Score	Description	Rating
109 to 147	A very beneficial impact that may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the (natural and / or social) environment	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the natural and / or social environment	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the natural and / or social environment	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural and / or social environment	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the natural and / or social environment	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the (natural and / or social) environment and result in severe effects	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts are likely to be irreversible and/or irreplaceable.	Major (negative)

11.2 Identification of Project Activities

The activities associated with the Project are listed in Table 11 below. The activities highlighted in red are applicable to this VIA.

Table 11: Project Activities

Activity No.	Activity
Construction Phase	
1	Mine development: Headgear, shafts and vent raises
2	Access / haul roads, TSF pipeline and stormwater drains / berms
3	Distribution powerlines and substations (< 33 kV)
4	Generation of power using diesel generators (< 10 MW)
Operational Phase	
5	Crushing: Waste rock crusher / mine crushers
6	Internal mine roads, haul roads, access roads and maintenance roads
7	Stockpiling: Waste rock berm, waste rock stockpile, high grade and low grade ore
8	Mining processes: Production shafts and vent raises
9	Generation of power using diesel generators (< 10 MW)
10	Water management infrastructure
Decommissioning Phase	
11	Demolition and removal of all infrastructure
12	Rehabilitation and sealing shafts

11.3 Visual Impact Assessment

The Project activities listed in Table 11 will be rated according to the impact they will have on the receiving environment, i.e. the environment before development. Negative visual impacts decrease the visual character of the pre-development environment. Neutral visual impacts assist to minimise the negative visual impacts of a development but don't result in a positive visual impact. A positive visual impact only occurs when an area is rehabilitated to a state that is better than the state of the pre-development environment, e.g. a mining area on previously agricultural land is rehabilitated to an area of natural vegetation and all visible signs of agriculture and mining area removed. Positive visual impacts rarely occur.

11.3.1 Construction Phase

The construction phase is characterised by site development and infrastructure construction. This includes site clearance and vegetation removal, topsoil removal and stockpiling, surface infrastructure development and drilling and blasting for shafts and vent raises. The

establishment of infrastructure and related construction activities will draw attention to the project area making receptors aware of the Project. The construction phase will have negative visual impacts on the receiving environment.

11.3.1.1 Activity 1: Mine Development: Headgear, Shafts and Vent Raises

Mine development including the construction of the headgear, shafts and vent raises will take place during the construction phase. This is expected to have a negative visual impact on the receiving environment. The interactions and resultant impacts of the mine development are indicated in Table 12.

Table 12: Interactions and Impacts of Mine Development

Interaction	Impact
Change of land use from agriculture to mining	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land-use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place resulting in a loss of scenic character and increased visual disturbance.
Site clearance, vegetation removal, topsoil removal and stockpiling	Site clearance and removal of vegetation will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.
Drilling and blasting for shafts and vent raises	Drilling and blasting for shafts and vent raises will have a negative visual impact on the receiving environment. Dust from blasting will also have a negative visual impact.
Infrastructure development	The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place.

11.3.1.1.1 Impact Description

Change in land use from agriculture to mining as a result of the headgear and associated shaft infrastructure will have a major negative visual impact on the receiving environment. The headgear is the tallest infrastructure component with a height of 96 m (previously 45 m) and is likely to be visible from a distance of up to 10 km. Site clearance and vegetation removal, and topsoil removal and stockpiling prior to the development of the shaft infrastructure will have a moderate negative visual impact on the receiving environment. Drilling and blasting for sinking shafts and vent raises will have a minor visual impact on the

receiving environment. Construction of the headgear and associated shaft infrastructure will have a moderate visual impact on the receiving environment.

11.3.1.1.2 Management Objectives

The management objectives are to minimise the negative visual impact caused by the change of land use from agriculture to mining. The management objectives also aim to minimise the negative visual impact caused by site clearance and vegetation removal, topsoil removal and stockpiling, drilling and blasting, and infrastructure development.

11.3.1.1.3 Management Actions

The following management actions are required for the mine development:

- Vegetation should only be removed when and where necessary;
- Topsoil should only be removed when and where necessary;
- Topsoil stockpiles should be vegetated with grasses (e.g. *Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha* and *Chloris gayana*) so as to blend into the surrounding landscape;
- Limit footprint area of topsoil stockpiles where possible;
- Limit the height of topsoil stockpiles to 4 – 5 metres to prevent the soil from becoming compacted;
- Apply dust suppression techniques to limit the dust dispersion from stockpiles;
- Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation;
- Ensure vegetation screens of indigenous trees (*Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya*) and shrubs (*Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen*) are built close to receptors (residential areas and roads) and maintained;
- Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible;
- Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used;
- Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established;

- If construction activities take place at night, down lighting must be implemented to minimise light pollution; and
- Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.

11.3.1.1.4 Impact Ratings

The impact ratings and mitigation / management measures for the mine development are summarised in Table 13.

Table 13: Potential Impacts of Mine Development

Activity and Interaction (Mine development results in change of land use from agriculture to mining)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place. The waste rock berm and waste rock stockpile will have a permanent and irreversible negative visual impact as the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future. The change in land use will contribute to the cumulative impacts of mining on the regional environment. The visibility of the existing and proposed mines in the region will alter the sense of place of the receiving environment from rural to industrial / mining and result in a loss of scenic character and increased visual disturbance. This impact can potentially be reversed during the decommissioning phase if all infrastructure is removed and the area is rehabilitated.			
Prior to Mitigation / Management			
Duration	Beyond Project Life (6)	The impact will remain for some time after the life of the Project and is potentially irreversible even with management.	Moderate negative (-105)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Irreplaceable Damage or Breakdown (6)	Irreplaceable damage to highly valued items of natural or social significance or breakdown of natural and / or social order.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Activity and Interaction (Mine development results in change of land use from agriculture to mining)			
Dimension	**Rating**	**Motivation**	**Significance**
Mitigation / Management Actions			
▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.			
Post-Mitigation			
Duration	Beyond Project Life (6)	The impact will remain for some time after the life of the Project and is potentially irreversible even with management.	Moderate negative (-98)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Very Serious (5)	Very serious widespread natural and / or social baseline changes. Irreparable damage to highly valued items.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Activity and Interaction (Mine development requires site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The removal of vegetation for site clearing will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-70)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Serious (4)	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	

Activity and Interaction (Mine development requires site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.		
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-63)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	

Activity and Interaction (Mine development requires site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Nature	Negative		

Activity and Interaction (Mine development requires drilling and blasting for sinking shafts and vent raises)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Drilling and blasting for shafts and vent raises will have a negative visual impact on the receiving environment. Dust from blasting will also have a negative visual impact.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-63)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Apply dust suppression techniques to limit the dust dispersion from blasting.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-48)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	

Activity and Interaction (Mine development requires drilling and blasting for sinking shafts and vent raises)			
Dimension	**Rating**	**Motivation**	**Significance**
Probability	Almost Certain / Highly Probable (6)	It is most likely that the impact will occur. < 80% probability	
Nature	Negative		

Activity and Interaction (Mine development requires infrastructure development)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The construction of the headgear and associated shaft infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. These visual impacts will occur until the headgear and associated shaft infrastructure is removed from the site. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place. The visual impacts from the construction area lighting will occur during the construction phase.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Moderate negative (-91)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Very Serious (5)	Very serious widespread natural and / or social baseline changes. Irreparable damage to highly valued items.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			

Activity and Interaction (Mine development requires infrastructure development)			
Dimension	**Rating**	**Motivation**	**Significance**
▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Moderate negative (-84)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Serious (4)	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

11.3.1.2 *Activity 2: Access / Haul Roads, TSF Pipeline and Stormwater Drains / Berms*

The roads and stormwater drains / berms to be constructed within the infrastructure area are not expected to result in any additional visual impact. The negative visual impact from the development of the infrastructure area was assessed in Activity 1 above (Section 11.3.1.1). The roads, TSF pipeline and stormwater drain to be constructed outside the infrastructure area will have a negative visual impact on the receiving environment. The interactions and resultant impacts of the access / haul roads, TSF pipeline and stormwater drains / berms are indicated in Table 14.

Table 14: Interactions and Impacts of Access / Haul Roads, TSF Pipeline and Stormwater Drains / Berms

Interaction	Impact
Change of land use from agriculture to mining	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land-use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place resulting in a loss of scenic character and increased visual disturbance.
Site clearance,, vegetation removal, topsoil removal and stockpiling	Site clearance and removal of vegetation will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.
Infrastructure development	The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place.

11.3.1.2.1 Impact Description

Change in land use from agriculture to mining as a result of the access / haul roads, TSF pipeline and stormwater drains / berms will have a moderate negative visual impact on the receiving environment. The TSF pipeline and stormwater drain to be constructed outside of the infrastructure area will have a more significant negative visual impact than the roads and stormwater drains / berms to be constructed within the infrastructure area. The negative visual impact from the development of the infrastructure area was assessed in Activity 1 above (Section 11.3.1.1) and the roads and stormwater drains / berms to be constructed within the infrastructure area are not expected to result in any additional visual impact.

Site clearance and vegetation removal, and topsoil removal and stockpiling prior to the development of the TSF pipeline and stormwater drain outside of the infrastructure area will have a moderate negative visual impact on the receiving environment. Construction of the TSF pipeline and stormwater drain outside of the infrastructure area will have a moderate visual impact on the receiving environment.

11.3.1.2.2 Management Objectives

The management objectives are to minimise the negative visual impact caused by the change of land use from agriculture to mining. The management objectives also aim to minimise the negative visual impact caused by site clearance and vegetation removal, topsoil removal and stockpiling and infrastructure development.

11.3.1.2.3 Management Actions

The following management actions are required for the access / haul roads, TSF pipeline and stormwater drains / berms:

- Vegetation should only be removed when and where necessary;
- Topsoil should only be removed when and where necessary;
- Topsoil stockpiles should be vegetated with grasses (e.g. *Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha* and *Chloris gayana*) so as to blend into the surrounding landscape;
- Limit footprint area of topsoil stockpiles where possible;
- Limit the height of topsoil stockpiles to 4 – 5 metres to prevent the soil from becoming compacted;
- Apply dust suppression techniques to limit the dust dispersion from stockpiles;
- Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible;
- Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used;
- Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established;
- If construction activities take place at night, down lighting must be implemented to minimise light pollution;
- Where possible spread topsoil and re-vegetate the servitude areas when construction is complete; and
- Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.

11.3.1.2.4 Impact Ratings

The impact ratings and mitigation / management measures for the access / haul roads, TSF pipeline and stormwater drains / berms are summarised in Table 15.

Table 15: Potential Impacts of Access / Haul Roads, TSF Pipeline and Stormwater Drains / Berms

Activity and Interaction (Access / haul roads, TSF pipeline and stormwater drains / berms result in change of land use from agriculture to mining)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place. The change in land use will contribute to the cumulative impacts of mining on the regional environment. The visibility of the existing and proposed mines in the region will alter the sense of place of the receiving environment from rural to industrial / mining and result in a loss of scenic character and increased visual disturbance. This impact can potentially be reversed during the decommissioning phase if all infrastructure is removed and the area is rehabilitated.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Moderate negative (-84)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Serious (4)	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Where possible spread topsoil and re-vegetate the servitude areas when construction is complete; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-70)
Extent	Limited (2)	The impact will extend only as far as the development site area.	

Activity and Interaction (Access / haul roads, TSF pipeline and stormwater drains / berms result in change of land use from agriculture to mining)			
Dimension	**Rating**	**Motivation**	**Significance**
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Activity and Interaction (TSF pipeline and stormwater drains require site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The removal of vegetation for site clearing will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	
Extent	Limited (2)	The impact will extend only as far as the development site area.	
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	Minor negative (-56)
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			

Activity and Interaction (TSF pipeline and stormwater drains require site clearance, vegetation removal, topsoil removal and stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
▪ Vegetation should only be removed when and where necessary; ▪ Where possible re-vegetate the servitude areas when construction is complete; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; and ▪ Where possible spread topsoil in the servitude areas when construction is complete.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-42)
Extent	Very Limited (1)	The impact is limited to specific isolated parts of the site.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

Activity and Interaction (Access / haul roads, TSF pipeline and stormwater drains / berms require infrastructure development)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. These visual impacts will occur until the infrastructure is removed from the site. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place. The visual impacts from the construction area lighting will occur during the construction phase.			

Activity and Interaction (Access / haul roads, TSF pipeline and stormwater drains / berms require infrastructure development)			
Dimension	**Rating**	**Motivation**	**Significance**
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Moderate negative (-77)
Extent	Limited (2)	The impact will extend only as far as the development site area.	
Intensity	Serious (4)	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-63)
Extent	Limited (2)	The impact will extend only as far as the development site area.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

11.3.1.3 Activity 3: Distribution Powerlines and Substations (< 33 kV)

The distribution powerlines and substations will be constructed within the infrastructure area. The negative visual impact from the development of the infrastructure area was assessed in Activity 1 above (Section 11.3.1.1) and the distribution powerlines and substations are not expected to result in any additional visual impact.

11.3.1.4 Activity 4: Generation of Power using Diesel Generators (< 10 MW)

The diesel generator yard will be located within the infrastructure area. The negative visual impact from the development of the infrastructure area was assessed in Activity 1 above (Section 11.3.1.1) and the diesel generator yard is not expected to result in any additional visual impact.

11.3.2 Operational Phase

The operational phase is characterised by crushing, hauling, stockpiling and mining processes. The operational phase is expected to have negative visual impacts on the receiving environment.

11.3.2.1 Activity 5: Crushing: Waste Rock Crusher / Mine Crushers

Crushing using the waste rock crusher and mine crushers will have a negative visual impact on the receiving environment. The interactions and resultant impacts of the crushing are indicated in Table 16.

Table 16: Interactions and Impacts of Crushing

Interaction	Impact
Crushing	Operation of the waste rock crusher and mine crushers will have a negative visual impact on the receiving environment. Dust from the waste rock crusher and mine crushers will also have a negative visual impact.

11.3.2.1.1 Impact Description

Operation of the waste rock crusher and mine crushers will have a minor negative visual impact on the receiving environment.

11.3.2.1.2 Management Objectives

The management objectives are to minimise the negative visual impact caused by operation of the waste rock crusher and mine crushers.

11.3.2.1.3 Management Actions

The following management actions are required for crushing:

- Apply dust suppression techniques to limit the dust dispersion from crushing.

11.3.2.1.4 Impact Ratings

The impact ratings and mitigation / management measures for the crushing are summarised in Table 17.

Table 17: Potential Impacts of Crushing

Activity and Interaction (Crushing)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Operation of the waste rock crusher and mine crushers will have a negative visual impact on the receiving environment. Dust from the waste rock crusher and mine crushers will also have a negative visual impact.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-45)
Extent	Limited (2)	The impact is limited to the site and its immediate surroundings.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Likely (5)	The impact may occur. < 65% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Apply dust suppression techniques to limit the dust dispersion from crushing.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Negligible negative (-32)
Extent	Very Limited (1)	The impact is limited to specific isolated parts of the site.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Probable (4)	The impact has occurred here or elsewhere and could therefore occur. < 50% probability	
Nature	Negative		

11.3.2.2 Activity 6: Internal Mine Roads, Haul Roads, Access Roads and Maintenance Roads

The internal mine roads, haul roads, access roads and maintenance roads will have a negative visual impact on the receiving environment. The interactions and resultant impacts of the hauling are indicated in Table 18.

Table 18: Interactions and Impacts of Internal Mine Roads, Haul Roads, Access Roads and Maintenance Roads

Interaction	Impact
Vehicular activity	Vehicular activity on internal mine roads, haul roads, access roads and maintenance roads will have a negative visual impact on the receiving environment. Dust from vehicular activity will also have a negative visual impact.

11.3.2.2.1 Impact Description

Vehicular activity on the internal mine roads, haul roads, access roads and maintenance roads will have a minor negative visual impact on the receiving environment.

11.3.2.2.2 Management Objectives

The management objectives are to minimise the negative visual impact caused by vehicular activity on the internal mine roads, haul roads, access roads and maintenance roads.

11.3.2.2.3 Management Actions

The following management actions are required for the internal mine roads, haul roads, access roads and maintenance roads:

- Roads should be wetted frequently by means of a water bowser to suppress dust.

11.3.2.2.4 Impact Ratings

The impact ratings and mitigation / management measures for the internal mine roads, haul roads, access roads and maintenance roads are summarised in Table 19.

Table 19: Potential Impacts of Internal Mine Roads, Haul Roads, Access Roads and Maintenance Roads

Activity and Interaction (Hauling)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Vehicular activity on internal mine roads, haul roads, access roads and maintenance roads will have a negative visual impact on the receiving environment. Dust from vehicular activity will also have a negative visual impact.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-45)
Extent	Limited (2)	The impact is limited to the site and its immediate surroundings.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Likely (5)	The impact may occur. < 65% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Roads should be wetted frequently by means of a water bowser to suppress dust.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-36)
Extent	Limited (2)	The impact is limited to the site and its immediate surroundings.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Probable (4)	The impact has occurred here or elsewhere and could therefore occur. < 50% probability	
Nature	Negative		

11.3.2.3 Activity 7: Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore

Stockpiling material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. The interactions and resultant impacts of the stockpiling are indicated in Table 20.

Table 20: Interactions and Impacts of Stockpiling

Interaction	Impact
Stockpiling	Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the waste rock berm and waste rock stockpile will be permanent as the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.

11.3.2.3.1 Impact Description

Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. These stockpiles will become noticeable from further as they increase in height and will begin to dominate the landscape for nearby receptors. Previously there were two waste rock stockpiles of 15 m and 17 m respectively and an ore stockpile of 8m. The amended Project now includes a waste rock stockpile, a high grade ore stockpile and a low grade ore stockpile each with a height of 25m.

The impact of the waste rock berm and waste rock stockpile will be permanent as it has been assumed that the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.

11.3.2.3.2 Management Objectives

The management objectives are to minimise the negative visual impact caused by stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile.

11.3.2.3.3 Management Actions

The following management actions are required for the stockpiling:

- Ensure the waste rock berm does not exceed the proposed height of 10 m;
- Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m;

- Apply dust suppression techniques to limit the dust dispersion from stockpiles;
- Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and
- Ensure vegetation screens of indigenous trees (*Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya*) and shrubs (*Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen*) are built close to receptors (residential areas and roads) and maintained.

11.3.2.3.4 Impact Ratings

The impact ratings and mitigation / management measures for the stockpiling are summarised in Table 21.

Table 21: Potential Impacts of Stockpiling

Activity and Interaction (Stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the waste rock berm and waste rock stockpile will be permanent as the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.			
Prior to Mitigation / Management			
Duration	Permanent (7)	The impact is irreversible, even with management, and will remain after the life of the Project.	Major negative (-112)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Irreplaceable Damage or Breakdown (6)	Irreplaceable damage to highly valued items of natural or social significance or breakdown of natural and / or social order.	

Activity and Interaction (Stockpiling)			
Dimension	**Rating**	**Motivation**	**Significance**
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Ensure the waste rock berm does not exceed the proposed height of 10 m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.			
Post-Mitigation			
Duration	Permanent (7)	The impact is irreversible, even with management, and will remain after the life of the Project.	Moderate negative (-105)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Very Serious (5)	Very serious widespread natural and / or social baseline changes. irreparable damage to highly valued items.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		

11.3.2.4 Activity 8: Mining Processes: Production Shafts and Vent Raises

Mining processes including operation of the production shafts will have a negative visual impact on the receiving environment. The interactions and resultant impacts of the mining processes are indicated in Table 22.

Table 22: Interactions and Impacts of Mining Processes

Interaction	Impact
Mining processes	Operation of the production shafts will have a negative visual impact on the receiving environment. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact. These visual impacts will occur for the life of the Project.

11.3.2.4.1 Impact Description

Movement of the headgear for operation of the production shafts will make the mine more noticeable and result in a negative visual impact on the receiving environment. Infrastructure and mine area lighting will also have a negative visual impact.

11.3.2.4.2 Management Objectives

The management objectives are to minimise the negative visual impact caused by operation of the production shafts.

11.3.2.4.3 Management Actions

The following management actions are required for the mining processes:

- Down lighting must be implemented to minimise light pollution around the infrastructure area at night.

11.3.2.4.4 Impact Ratings

The impact ratings and mitigation / management measures for the mining processes are summarised in Table 23.

Table 23: Potential Impacts of Mining Processes

Activity and Interaction (Mining Processes)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Operation of the production shafts will have a negative visual impact on the receiving environment. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact. These visual impacts will occur for the life of the Project.			
Prior to Mitigation / Management			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-66)

Activity and Interaction (Mining Processes)			
Dimension	**Rating**	**Motivation**	**Significance**
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	
Probability	Almost Certain / Highly Probable (6)	It is most likely that the impact will occur. < 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night.			
Post-Mitigation			
Duration	Project Life (5)	The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Minor negative (-50)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Likely (5)	The impact may occur. < 65% probability	
Nature	Negative		

11.3.3 Decommissioning Phase

The decommissioning phase is characterised by demolition and removal of infrastructure and rehabilitation and sealing of shafts. These activities will have a minor negative visual impact on the receiving environment. Once the decommissioning phase is complete there will be an overall neutral visual impact on the receiving environment which will assist to return the project area to a state similar to the pre-mining state.

It was assumed that the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.

11.3.3.1 Activity 11: Demolition and Removal of All Infrastructure

Demolition and removal of all infrastructures will have a negative visual impact on the receiving environment. The interactions and resultant impacts of the demolition and removal of all infrastructures are indicated in Table 24.

Table 24: Interactions and Impacts of Demolition and Removal of All Infrastructures

Interaction	Impact
Demolition and removal of infrastructure	Demolition and removal of infrastructure will have a negative visual impact on the receiving environment. Once the infrastructure is removed, there will be an overall neutral visual impact on the receiving environment.

11.3.3.1.1 Impact Description

Demolition and removal of infrastructure will have a minor negative visual impact on the receiving environment. Once the infrastructure is removed and rehabilitation is complete, there will be an overall neutral visual impact on the receiving environment and it will be returned to a state similar to the pre-development state.

11.3.3.1.2 Management Objectives

The management objectives are to increase the neutral visual impact caused by the demolition and removal of infrastructure.

11.3.3.1.3 Management Actions

The following management actions are required for the demolition and removal of all infrastructures:

- Apply dust suppression techniques to limit the dust from the demolition area; and
- Limit the quantity and time of rubble stored on site.

11.3.3.1.4 Impact Ratings

The impact ratings and mitigation / management measures for the demolition and removal of all infrastructures are summarised in Table 25.

Table 25: Potential Impacts of Demolition and Removal of All Infrastructures

Activity and Interaction (Demolition and removal of all infrastructure)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Demolition and removal of infrastructure will have a minor negative visual impact on the receiving environment. Once the infrastructure is removed, there will be an overall neutral visual impact on the receiving environment. This will help to reverse some of the changes that occurred when the infrastructure was constructed.			
Prior to Mitigation / Management			

Activity and Interaction (Demolition and removal of all infrastructure)			
Dimension	**Rating**	**Motivation**	**Significance**
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-56)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Apply dust suppression techniques to limit the dust from the demolition area; and ▪ Limit the quantity and time of rubble stored on site.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-42)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Minimal (1)	Minimal natural and / or social impacts, low-level replaceable damage with no change to the baseline.	
Probability	Almost Certain / Highly Probable (6)	It is most likely that the impact will occur. < 80% probability	
Nature	Negative		

11.3.3.2 Activity 12: Rehabilitation and Sealing of Shafts

Rehabilitation and sealing of shafts will have a negative visual impact on the receiving environment. The interactions and resultant impacts of the rehabilitation and sealing of shafts are indicated in Table 26.

Table 26: Interactions and Impacts of Rehabilitation and Sealing of Shafts

Interaction	Impact
Rehabilitation of disturbed areas by spreading topsoil, profiling and contouring, and re-vegetation	Rehabilitation of disturbed areas will have a negative visual impact on the receiving environment. Once rehabilitation is complete, there will be a neutral visual impact on the receiving environment.
Sealing of shafts	Sealing of shafts will have a negative visual impact on the receiving environment. Once the shafts are sealed and rehabilitation is complete, there will be a neutral visual impact on the receiving environment.

11.3.3.2.1 Impact Description

Rehabilitation of disturbed areas by spreading topsoil, profiling and contouring, and re-vegetation is expected to have a minor negative visual impact on the receiving environment. Sealing of shafts will have a minor negative visual impact on the receiving environment. Once the shafts are sealed and the rehabilitation is complete, there will be an overall neutral visual impact on the receiving environment and it will be returned to a state similar to the pre-development state.

11.3.3.2.2 Management Objectives

The management objectives are to increase the neutral visual impact caused by the rehabilitation of disturbed areas and sealing of shafts.

11.3.3.2.3 Management Actions

The following management actions are required for the rehabilitation and sealing of shafts:

- Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography;
- Spread topsoil over the rehabilitated area;
- Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography;
- Re-vegetate the rehabilitated areas; and
- Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.

11.3.3.2.4 Impact Ratings

The impact ratings and mitigation / management measures for the rehabilitation and sealing of shafts are summarised in Table 27.

Table 27: Potential Impacts of Rehabilitation and Sealing of Shafts

Activity and Interaction (Rehabilitation of disturbed areas)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Rehabilitation of disturbed areas will have a minor negative visual impact on the receiving environment. Once the rehabilitation is complete, there will be an overall neutral visual impact on the receiving environment. This will assist to return the project area to a state similar to the pre-development state.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-63)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	On-going (3)	On-going natural and / or social issues. Discernible changes to natural or social baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-48)
Extent	Local (3)	The impact will extend only as far as the development site area.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	

Activity and Interaction (Rehabilitation of disturbed areas)			
Dimension	**Rating**	**Motivation**	**Significance**
Probability	Almost Certain / Highly Probable (6)	It is most likely that the impact will occur. < 80% probability	
Nature	Negative		

Activity and Interaction (Sealing of shafts)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Sealing of shafts will have a negative visual impact on the receiving environment. Once the shafts are sealed and rehabilitation is complete, there will be a neutral visual impact on the receiving environment.			
Prior to Mitigation / Management			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Minor negative (-42)
Extent	Very Limited (1)	The impact is limited to specific isolated parts of the site.	
Intensity	Minor (2)	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	
Probability	Definite (7)	There are sound scientific reasons to expect that the impact will definitely occur. > 80% probability	
Nature	Negative		
Mitigation / Management Actions			
▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.			
Post-Mitigation			
Duration	Medium Term (3)	The impact will occur for 1-5 years and the impact can be reversed with minimal management.	Negligible negative (-30)
Extent	Very Limited (1)	The impact is limited to specific isolated parts of the site.	
Intensity	Minimal (1)	Minimal natural and / or social impacts, low-level replaceable damage with no change to the baseline.	

Activity and Interaction (Sealing of shafts)			
Dimension	**Rating**	**Motivation**	**Significance**
Probability	Almost Certain / Highly Probable (6)	It is most likely that the impact will occur. < 80% probability	
Nature	Negative		

11.3.4 Post-Closure Phase

There will be a permanent and irreversible negative impact from the waste rock berm and waste rock stockpile as it has been assumed that the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.

12 Cumulative Impacts

The nearest operational mine is the Anglo Platinum Mogalakwena Platinum Mine situated approximately 4.8 km north-west of the project area. This existing mine has impacts on the visual aesthetics / character of the regional environment. The possible development of these mines as well as the development of the Project will add to these existing visual impacts. The visibility of these large developments will alter the sense of place of the receiving environment from rural to industrial / mining and result in a loss of scenic character and increased visual disturbance.

12.1 Social

The project area and surrounds are characterised by traditional authorities consisting of numerous rural settlements and the associated agricultural land used for subsistence farming. This gives the region a rural sense of place. The existing and proposed mining projects change the sense of place to an industrial / mining sense of place and result in a loss of scenic character and increased visual disturbance. The landscape will transform from one dominated by rural communities and agriculture into one dominated by mining and industry. Refer to the Social Impact Assessment Report, 2013 for further details.

12.2 Heritage

The Project is situated in a highly sensitive cultural landscape. The Makapan Valley WHS buffer is situated 2.8 km east-south-east and 9.7 km south-east of the project area and the infrastructure area respectively. The Makapan Valley WHS core area is situated 14.1 km and 18.8 km east-south-east of the project area and the infrastructure area respectively, but won't be affected and described in Section 9. The Malokong Hill heritage site is situated 23.5 km and 25.4 km north-west of the project area and the infrastructure area respectively. Due to the heritage links between these two sites, both sites and the area between them are

culturally significant. The change of the sense of place as a result of existing and proposed mining projects will result in a negative impact on the local and regional heritage resources. Refer to the Heritage Impact Assessment Report, 2016 for further details.

13 Environmental Management Programme

An Environmental Management Programme (EMPr) is a delivery mechanism for the measures identified in Section 11 and ensures a systematic approach to bringing environmental and social considerations into decision making and day-to-day operations. It establishes a framework for tracking, evaluating and communicating environmental and social performance and helps ensure that environmental risks and liabilities are identified, minimized and managed. This EMPr details the additional mitigation measures Ivanplats will implement throughout the Project lifecycle.

The EMPr has been developed to meet national environmental requirements, in particular the provisions of the NEMA. Ivanplats will, therefore, need to commit to preventing pollution and making resources available to ensure that all reasonable safeguards are in place to do so. In addition, Ivanplats will need to accept accountability and financial liability for any pollution that may occur as a result of project activities.

The EMPr will be a living document, and will continue to develop during the design and construction phase to enable continuous improvement of the Project's social and environmental performance. The EMPr will also be reviewed against changes in the regulatory regime and in the event of new policies or guidelines from the relevant Competent Authorities. Periodic reviews and updating will also be carried out throughout the project lifecycle, to incorporate changes in activities and any changes in the overarching management systems.

The EMPr is intended to cover those activities described in Section 11 of this VIA report. It covers project activities during construction, operation and decommissioning.

The ultimate goal of the EMPr is to:

- Incorporate environmental management into project design and operating procedures;
- Serve as an action plan for environmental management for the Project and provide a framework for implementing project environmental commitments (i.e. mitigation measures identified in the EIA);
- Ensure that all workers, subcontractors and others involved in the Project meet legal and other requirements with regard to environmental management;
- Address concerns and issues raised in the EIA's stakeholder consultation process and those that will likely continue to arise during the Project's lifetime; and
- Prepare and maintain records of project environmental performance (i.e. monitoring, audits and non-compliance tracking).

13.1 Project Activities with Potentially Significant Impacts

The project activities with potentially significant visual impacts are listed in Table 28.

Table 28: Potentially Significant Visual Impacts of the Proposed Project

Phase	Activity	Interaction	Potential Significant Impacts
Construction	Activity 1: Mine Development: Headgear, Shafts and Vent Raises	Change of land use from agriculture to mining	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land-use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place resulting in a loss of scenic character and increased visual disturbance.
		Site clearance and vegetation removal, topsoil removal and stockpiling	Site clearance and removal of vegetation will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.
		Drilling and blasting for sinking shafts and vent raises	Drilling and blasting for shafts and vent raises will have a negative visual impact on the receiving environment. Dust from blasting will also have a negative visual impact.
		Infrastructure development	The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place.
	Activity 2: Access / Haul Roads, TSF Pipeline and Stormwater Drains / Berms	Change of land use from agriculture to mining	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land-use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place resulting in a loss of scenic character and increased visual disturbance.
		Site clearance, vegetation removal, topsoil removal and stockpiling	Site clearance and removal of vegetation will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.
		Infrastructure development	The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place.
Operational	Activity 5: Crushing: Waste Rock Crusher / Mine Crushers	Crushing	Operation of the waste rock crusher and mine crushers will have a negative visual impact on the receiving environment. Dust from the waste rock crusher and mine crushers will also have a negative visual impact.
	Activity 6: Internal Mine Roads, Haul Roads, Access Roads and Maintenance Roads	Vehicular activity	Vehicular activity on internal mine roads, haul roads, access roads and maintenance roads will have a negative visual impact on the receiving environment. Dust from vehicular activity will also have a negative visual impact.
	Activity 7: Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	Stockpiling	Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the waste rock berm and waste rock stockpile will be permanent as the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.
	Activity 8: Mining Processes: Production Shafts and Vent Raises	Mining processes	Operation of the production shafts will have a negative visual impact on the receiving environment. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact. These visual impacts will occur for the life of the Project.

Phase	Activity	Interaction	Potential Significant Impacts
Decommissioning	Activity 11: Demolition and Removal of All Infrastructure	Demolition and removal of infrastructure	Demolition and removal of infrastructure will have a negative visual impact on the receiving environment. Once the infrastructure is removed, there will be an overall neutral visual impact on the receiving environment.
	Activity 12: Rehabilitation and Sealing of Shafts	Rehabilitation of disturbed areas by spreading topsoil, profiling and contouring, and re-vegetation	Rehabilitation of disturbed areas will have a negative visual impact on the receiving environment. Once rehabilitation is complete, there will be a neutral visual impact on the receiving environment.
		Sealing of shafts	Sealing of shafts will have a negative visual impact on the receiving environment. Once the shafts are sealed and rehabilitation is complete, there will be a neutral visual impact on the receiving environment.

13.2 Summary of Mitigation and Management Measures

Table 29, Table 30 and Table 31 provide a summary of the proposed project activities, environmental aspects and impacts on the receiving environment. Information on the frequency of mitigation, relevant legal requirements, recommended management plan, timing of implementation, and roles / responsibilities of persons implementing the EMPr are also included. The prescribed environmental management standards, practices, guidelines, policies and laws are listed in Table 32.

Table 29: Visual Impacts

Phase	Activity	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Construction	Activity 1: Mine Development: Headgear, Sinking Shafts and Vent Raises	Local	▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary; ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres to prevent the soil from becoming compacted; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained; ▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	IFC Performance Standard 3 (2012)	Construction Phase
	Activity 2: Access / Haul Roads, TSF Pipeline and Stormwater Drains / Berms	Local	▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary; ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres to prevent the soil from becoming compacted; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution;	IFC Performance Standard 3 (2012)	Construction Phase

Phase	Activity	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			▪ Where possible spread topsoil and re-vegetate the servitude areas when construction is complete; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.		
Operational	Activity 5: Crushing: Waste Rock Crusher / Mine Crushers	Limited	▪ Apply dust suppression techniques to limit the dust dispersion from crushing.	IFC Performance Standard 3 (2012)	Operational Phase
	Activity 6: Internal Mine Roads, Haul Roads, Access Roads and Maintenance Roads	Limited	▪ Roads should be wetted frequently by means of a water bowser to suppress dust.	IFC Performance Standard 3 (2012)	Operational Phase
	Activity 7: Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	Local	▪ Ensure the waste rock berm does not exceed the proposed height of 10 m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.	IFC Performance Standard 3 (2012)	Operational Phase
	Activity 8: Mining Processes: Production Shafts and Vent Raises	Local	▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night.	IFC Performance Standard 3 (2012)	Operational Phase
Decommissioning	Activity 11: Demolition and Removal of All Infrastructure	Local	▪ Apply dust suppression techniques to limit the dust from the demolition area; and ▪ Limit the quantity and time of rubble stored on site.	IFC Performance Standard 3 (2012)	Upon cessation of project.
	Activity 12: Rehabilitation and Sealing of Shafts	Local	▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	IFC Performance Standard 3 (2012)	Upon cessation of project.

Table 30: Objectives and Outcomes of the Visual EMPr

Phase	Activity	Potential Impacts	Aspects Affected	Mitigation	Standard to be Achieved / Objective
Construction	Activity 1: Mine Development: Headgear, Shafts and Vent Raises	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land-use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place resulting in a loss of scenic character and increased visual disturbance.	Visual	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	To minimise the negative visual impact caused by change of land use from agriculture to industry / mining.
		Site clearance and removal of vegetation will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.		▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.	To minimise the negative visual impact caused by site clearance, removal of vegetation, topsoil removal and stockpiling.
		Drilling and blasting for shafts and vent raises will have a negative visual impact on the receiving environment. Dust from blasting will also have a negative visual impact.		▪ Apply dust suppression techniques to limit the dust dispersion from blasting.	To minimise the negative visual impact caused by drilling and blasting.

Phase	Activity	Potential Impacts	Aspects Affected	Mitigation	Standard to be Achieved / Objective
		The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place.		▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	To minimise the negative visual impact caused by construction of infrastructure.
	Activity 2: Access / Haul Roads, TSF Pipeline and Stormwater Drains / Berms	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land-use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place resulting in a loss of scenic character and increased visual disturbance.		▪ Where possible spread topsoil and re-vegetate the servitude areas when construction is complete; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	To minimise the negative visual impact caused by change of land use from agriculture to industry / mining.
		Site clearance and removal of vegetation will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.		▪ Vegetation should only be removed when and where necessary; ▪ Where possible re-vegetate the servitude areas when construction is complete; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; and ▪ Where possible spread topsoil in the servitude areas when construction is complete.	To minimise the negative visual impact caused by site clearance, removal of vegetation, topsoil removal and stockpiling.

Phase	Activity	Potential Impacts	Aspects Affected	Mitigation	Standard to be Achieved / Objective
		The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place.		▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.	To minimise the negative visual impact caused by construction of infrastructure.
Operational	Activity 5: Crushing: Waste Rock Crusher / Mine Crushers	Operation of the waste rock crusher and mine crushers will have a negative visual impact on the receiving environment. Dust from the waste rock crusher and mine crushers will also have a negative visual impact.		▪ Apply dust suppression techniques to limit the dust dispersion from crushing.	To minimise the negative visual impact caused by operation of the waste rock crusher and mine crushers.
	Activity 6: Internal Mine Roads, Haul Roads, Access Roads and Maintenance Roads	Vehicular activity on internal mine roads, haul roads, access roads and maintenance roads will have a negative visual impact on the receiving environment. Dust from vehicular activity will also have a negative visual impact.		▪ Roads should be wetted frequently by means of a water bowser to suppress dust.	To minimise the negative visual impact caused by vehicular activity on the internal mine roads, haul roads, access roads and maintenance roads.
	Activity 7: Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the waste rock berm and waste rock stockpile will be permanent as the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.		▪ Ensure the waste rock berm does not exceed the proposed height of 10 m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.	To minimise the negative visual impact caused by stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile.

Phase	Activity	Potential Impacts	Aspects Affected	Mitigation	Standard to be Achieved / Objective
	Activity 8: Mining Processes: Production Shafts and Vent Raises	Operation of the production shafts will have a negative visual impact on the receiving environment. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact. These visual impacts will occur for the life of the Project.		▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night.	To minimise the negative visual impact caused by operation of the production shafts.
Decommissioning	Activity 11: Demolition and Removal of All Infrastructure	Demolition and removal of infrastructure will have a negative visual impact on the receiving environment. Once the infrastructure is removed, there will be an overall neutral visual impact on the receiving environment.		▪ Apply dust suppression techniques to limit the dust from the demolition area; and ▪ Limit the quantity and time of rubble stored on site.	To increase the neutral visual impact caused by the demolition and removal of infrastructure.
	Activity 12: Rehabilitation and Sealing of Shafts	Rehabilitation of disturbed areas will have a negative visual impact on the receiving environment. Once rehabilitation is complete, there will be a neutral visual impact on the receiving environment.		▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	To increase the neutral visual impact caused by the rehabilitation of disturbed areas.
		Sealing of shafts will have a negative visual impact on the receiving environment. Once the shafts are sealed and rehabilitation is complete, there will be a neutral visual impact on the receiving environment.		▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	To increase the neutral visual impact caused by the sealing of shafts.

Table 31: Visual Mitigation

Activity	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
Activity 1: Mine Development: Headgear, Shafts and Vent Raises	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land-use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place resulting in a loss of scenic character and increased visual disturbance.	Visual	▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.	Construction Phase	No legal requirements for visual in South Africa

Activity	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
	Site clearance and removal of vegetation will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.		▪ Vegetation should only be removed when and where necessary; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.		
	Drilling and blasting for shafts and vent raises will have a negative visual impact on the receiving environment. Dust from blasting will also have a negative visual impact.		▪ Apply dust suppression techniques to limit the dust dispersion from blasting.		
	The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place.		▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.		
Activity 2: Access / Haul Roads, TSF Pipeline and Stormwater Drains / Berms	Change of land use from agriculture to mining will have a negative visual impact on the receiving environment. This change in land-use will change the sense of place of the project area and surrounds from a rural sense of place to an industrial / mining sense of place resulting in a loss of scenic character and increased visual disturbance.		▪ Where possible spread topsoil and re-vegetate the servitude areas when construction is complete; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.		

Activity	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
	Site clearance and removal of vegetation will have a negative visual impact on the receiving environment. The infrastructure area will become noticeable to nearby receptors as it will contrast the surrounding areas. Topsoil removal and stockpiling will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact.		▪ Vegetation should only be removed when and where necessary; ▪ Where possible re-vegetate the servitude areas when construction is complete; ▪ Topsoil should only be removed when and where necessary (refer to the Soils report for further details); ▪ Topsoil stockpiles should be vegetated with grasses (e.g. Eragrostis chloromelas, Cynodon dactylon, Digitaria eriantha and Chloris gayana) so as to blend into the surrounding landscape; ▪ Limit footprint area of topsoil stockpiles where possible; ▪ Limit the height of topsoil stockpiles to 4 – 5 metres; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; and ▪ Where possible spread topsoil in the servitude areas when construction is complete.		
	The construction of surface infrastructure will have a negative visual impact on the receiving environment. The surface infrastructure will change the sense of place of the project area from a rural sense of place to an industrial / mining sense of place. Construction area lighting at night will have a negative visual impact on the receiving environment. The construction area lighting will be visible from afar and will draw attention to the project area. This will also have a negative impact on the sense of place.		▪ Surface infrastructure should be painted natural hues so as to blend into the surrounding landscape where possible; ▪ Pylons and metal structures should be galvanised so as to weather to a matt grey finish rather than be painted silver. If the pylons and metal structures are painted, it is recommended that a neutral matt finish be used; ▪ Construction of vegetation berms must be implemented close to surface infrastructure so that vegetation can be established; and ▪ If construction activities take place at night, down lighting must be implemented to minimise light pollution.		
Activity 5: Crushing: Waste Rock Crusher / Mine Crushers	No additional visual impacts expected.		▪ N/A	Operational Phase	
Activity 6: Internal Mine Roads, Haul Roads, Access Roads and Maintenance Roads	Operation of the waste rock crusher and mine crushers will have a negative visual impact on the receiving environment. Dust from the waste rock crusher and mine crushers will also have a negative visual impact.		▪ Apply dust suppression techniques to limit the dust dispersion from crushing.		
Activity 7: Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	Vehicular activity on internal mine roads, haul roads, access roads and maintenance roads will have a negative visual impact on the receiving environment. Dust from vehicular activity will also have a negative visual impact.		▪ Roads should be wetted frequently by means of a water bowser to suppress dust.		

Activity	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
Activity 8: Mining Processes: Production Shafts and Vent Raises	Stockpiling of material on the waste rock berm, waste rock stockpile, high grade ore stockpile and low grade ore stockpile will have a negative visual impact on the receiving environment. Dust from the stockpiles will also have a negative visual impact. The impact of the waste rock berm and waste rock stockpile will be permanent as the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.		▪ Ensure the waste rock berm does not exceed the proposed height of 10 m; ▪ Ensure the waste rock stockpile, high grade ore stockpile and low grade ore stockpile do not exceed the proposed height of 25 m; ▪ Apply dust suppression techniques to limit the dust dispersion from stockpiles; ▪ Plant fast-growing indigenous vegetation in areas where it can conceal the stockpiles and reduce dust generation; and ▪ Ensure vegetation screens of indigenous trees (Acacia erubescens (d), A. gerrardii (d), A. mellifera subsp. detinens (d), A. rehmanniana (d), Boscia albitrunca (d), Combretum apiculatum (d), Acacia tortillis subsp. heteracantha, Terminalia sericea, Acacia Burkei (d), A. robusta, Sclerocarya birrea subsp. caffra. Burkea africana (d) Combretum apiculatum (d), C zeyheri, Terminalia sericea (d), Ochna pulchra, Peltophorum africanum, Searsia leptodictya) and shrubs (Grewia flava, Hibiscus calyphyllus, Lycium shawii, Rhigozum obovatum, Combretum hereoense, Grewia bicolor, G. Monticola, Strychnos pungen) are built close to receptors (residential areas and roads) and maintained.		
Activity 11: Demolition and Removal of All Infrastructure	Operation of the production shafts will have a negative visual impact on the receiving environment. Infrastructure and mine area lighting will be visible at night resulting in a negative visual impact. These visual impacts will occur for the life of the Project.		▪ Down lighting must be implemented to minimise light pollution around the infrastructure area at night.	Decommissioning Phase	
Activity 12: Rehabilitation and Sealing of Shafts	Demolition and removal of infrastructure will have a negative visual impact on the receiving environment. Once the infrastructure is removed, there will be an overall neutral visual impact on the receiving environment.		▪ Apply dust suppression techniques to limit the dust from the demolition area; and ▪ Limit the quantity and time of rubble stored on site.		
	Rehabilitation of disturbed areas will have a negative visual impact on the receiving environment. Once rehabilitation is complete, there will be a neutral visual impact on the receiving environment.		▪ Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; ▪ Spread topsoil over the rehabilitated area; ▪ Ensure that surface water and drainage lines are rehabilitated to create a free-draining topography; ▪ Re-vegetate the rehabilitated areas; and ▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.		
	Sealing of shafts will have a negative visual impact on the receiving environment. Once the shafts are sealed and rehabilitation is complete, there will be a neutral visual impact on the receiving environment.		▪ Ensure all mitigation measures outlined in the Closure and Rehabilitation Reports (2016) are conducted.		

Table 32: Prescribed Environmental Management Standards, Practices, Guidelines, Policies or Laws for Visual

Specialist Field	Applicable Standard, Practice, Guideline, Policy or Law
Visual	(Refer to Section 4 above) **International** ▪ European Landscape Convention (2007); ▪ IFC Performance Standard 3 (2012); and ▪ World Bank Environmental, Health and Safety Guidelines for Mining (2007). **National** ▪ Regulations in Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA); ▪ Section 23(1)(d) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA); ▪ National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA); and ▪ Section 17 of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEM: PAA). **Guideline** ▪ Guideline for involving visual and aesthetic specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 F (2005)

13.3 General Mitigation

According to Bush et al (1979), vegetation screening is the best mitigation measure to conceal a development. Figure 11 illustrates the screening effect of vegetation. It is recommended that any vegetation which may potentially conceal the proposed development be left undisturbed, especially on the Project boundary and around infrastructure. Vegetation left undisturbed along the perimeter of the Project has the ability to conceal the proposed infrastructure from nearby receptors. Figure 12 illustrates the effect of cleared vegetation allowing direct views of the proposed infrastructure.

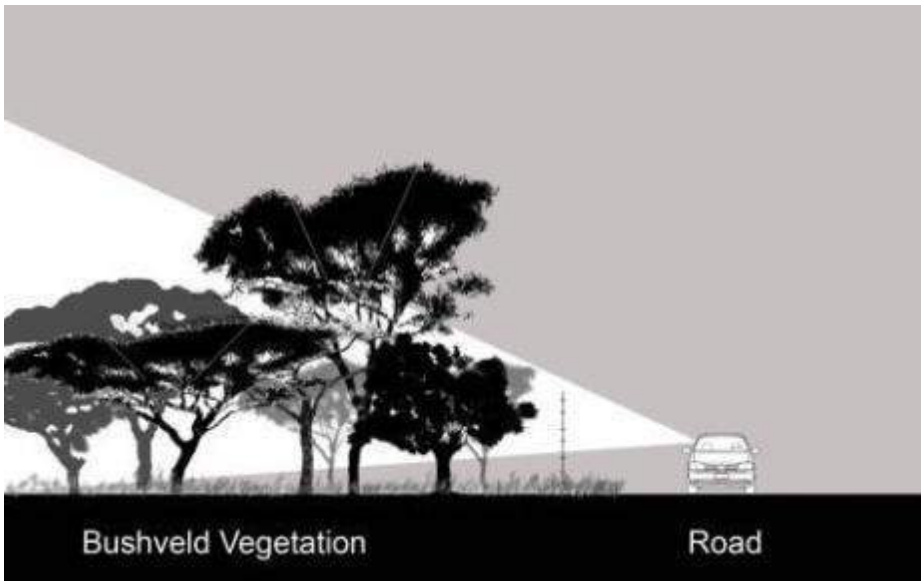


Figure 11: Screening effect of vegetation

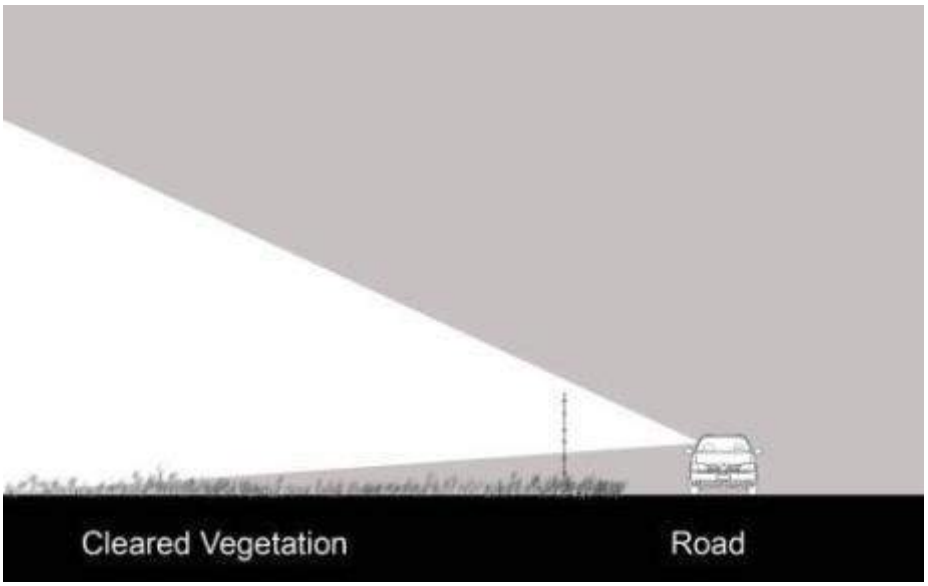


Figure 12: Effect of cleared vegetation

Other general mitigation measures that should be implemented where possible include:

- As much existing vegetation as possible should be retained, specifically bushes and trees if present. This will assist to conceal the development;
- Areas susceptible to dust should be frequently wetted by means of a water bowser. It is extremely important to suppress the visual aspects of dust to avoid creating the impression of a polluting industry;
- Down lighting must be implemented to minimise light pollution at night; and
- An appropriate grievance mechanism should be developed to respond to grievances from receptors that relate to visual aspects.

14 Monitoring Programme

Ivanplats will be responsible for the implementation of all monitoring actions. The recommended monitoring actions for the identified impacts are detailed below. Ivanplats will also be responsible for keeping a record of all environmental monitoring undertaken for the Project.

The following monitoring activities should be undertaken on a monthly basis for the life of the Project:

- Dust monitoring and management as per the Air Quality Monitoring Plan (reducing the dust on site will reduce the visual impact of dust);
- Vegetation screens need to be maintained and protected against fire and utilisation of the vegetation for fire wood, etc.; and
- Grievances from visual receptors must be monitored and addressed through a Grievance Mechanism.

15 Relevant Comments and Responses

This is a draft VIA Addendum Report. Once this report has been made available for public review, the comments and responses section will be populated with any comments received.

16 Recommendations

It is recommended that the mitigation measures detailed in Section 13 above are implemented to reduce the impact that the Project will have on the visual character of the receiving environment. Vegetation and topsoil should only be removed when and where necessary to avoid exposing larger areas for longer periods of time which could result in soil erosion and increased visual disturbance.

The most important mitigation aspect is rehabilitation of the site. The success of this rehabilitation will influence the overall long term impacts of the Project. Where possible, it is of utmost importance that the topography of the site be re-contoured and profiled to create a free-draining topography that resembles the pre-mining topography as closely as possible. It

is also essential to reconstruct all pre-development surface water and drainage lines to ensure that a free-draining surface is created and that the surface water flow returns to its original state. After re-contouring and profiling the site, it should be covered with topsoil and re-vegetated to complete the rehabilitation process.

The waste rock berm and waste rock stockpile will stand out in the surrounding area and will have a long term visual impact. If the waste rock berm and waste rock stockpile could be spread to reduce the height, the visual impact could be reduced. In addition, rehabilitation (vegetating) of these large features can significantly reduce the visual impacts. The waste rock could also be crushed and sold as building material thereby removing it from the site. It is also known that backfilling may be considered at a later stage, which will result in the use of this material. This will be subject to a separate application.

17 Conclusion

The receiving environment of the Project has a high visual sensitivity as there are highly visible and potentially sensitive areas in the landscape. This is due to the largely rural sense of place of the receiving environment as well as the proximity of numerous villages, the Witvinger Nature Reserve, Glenesk Private Nature Reserve, Rousseau Snyman Private Nature Reserve, H. L. Crause Private Nature Reserve, Percy Fyfe Nature Reserve and the Makapan Valley WHS to the Project. The topography of the project area is relatively flat and is expected to provide only minimal screening of the Project. The mountainous areas to the east and west of the project area will provide screening of the Project to those areas on the opposite sides of the mountains. The receiving environment is characterised by subsistence agriculture and livestock grazing with little of the natural Bushveld vegetation remaining. The agricultural and natural vegetation will only provide minimal screening of the proposed development.

The theoretical viewshed model for the Project was refined to a practical viewshed model with a buffer of 10 km around the mine infrastructure area and divided into areas that are likely to experience different categories of visual exposure. Due to the nature of the receiving environment it is unlikely that the proposed infrastructure will be visible beyond this 10 km buffer. The practical viewshed model depicts the area from which the Project is likely to be visible. This practical viewshed covers an area of 321.92 km².

The Project has a high visibility and a high visual exposure as it will be visible from a large area and will be dominant in the landscape and clearly noticeable to the viewer. The Project has a medium visual intrusion as it partially fits into the surroundings due to the proximity of the Mokgalakwena Platinum Mine, but will still be clearly noticeable.

The receiving environment and receptors of the Project have a high sensitivity. The receiving environment has a low VAC because there is little screening by the topography and vegetation. According to Oberholzer (2005), the Project can be categorised as having a very high visual impact on the receiving environment. This impact could potentially be reduced to a high visual impact if the recommended mitigation measures are implemented.

The Project will have negative visual impacts on the receiving environment. The waste rock berm and waste rock stockpile will have a permanent and irreversible negative visual impact as the shafts will not be backfilled at this stage and the waste rock berm and waste rock stockpile will remain on the surface indefinitely. This impact will become reversible if the waste rock berm and waste rock stockpile are used to backfill the shafts in the future.

During the closure phase, the negative impacts can be reduced by implementing various mitigation measures; the most important of these is rehabilitation with the emphasis being on re-contouring the site and reconstructing the surface water and drainage lines. The success of this rehabilitation will influence the overall long term impact of the Project on the topography and visual / aesthetic character of the receiving environment. Refer to the Closure and Rehabilitation Reports, 2016 for further details.

Based on the findings of this VIA only (not taking into account the findings of any other studies), from a visual perspective it is recommended that the Project proceeds provided that the recommended mitigation measures are implemented.

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Appendix A: Declaration of Independence

Digby Wells and Associates (South Africa) (Pty) Ltd

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I, Stephanie Mulder as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Ivanplats (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the proposed Platreef Project, Limpopo Province.



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Full Name	Stephanie Claire Mulder
Title / Position	Unit Manager: GIS
Qualifications	BSc Honours (Geography)
Experience (Years)	9 years
Registration	GISSA

Appendix B: Specialist CV

Mrs. Stephanie Mulder

Unit Manager: GIS

GIS, Remote Sensing & Noise

Digby Wells Environmental

1 Education

Year	Qualification
2006	BSc (Hons) Geography (cum laude) at University of Johannesburg Major subjects: Philosophy and Research Methodology; Strategic Environmental Planning; Geographic Information Systems (GIS); Urban Geography and Geomorphology
2003 to 2005	BSc Geography and Informatics with Financial Orientation at University of Johannesburg Major subjects: Geography and Informatics Ancillary subjects: Mathematics; Analytical Techniques; Financial Management; Accounting and Business Management

2 Training

Year	Course
2012	Diplôme D'Études en Langue Française – DELF A1 (La Commission Nationale du DELF et du DALF)
2011	ArcPad for ArcGIS (ESRI)
2011	Mining for Non-Miners (Snowden)
2009	Emerging Management Development Programme (EMDP) (University of Pretoria in association with the Public Administration Leadership and Management academy (PALAMA) and the School of Public Management and Administration)
2008	Building Geodatabases (ESRI)
2008	Geodatabase Design Concepts (ESRI)
2007	Introduction to ArcGIS I (ESRI)

3 Language Skills

Language	Level
English	Excellent
Afrikaans	Good
French	Intermediate

4 Employment

Date	Company	Position
1 July 2012 to Present	Digby Wells Environmental	Unit Manager: GIS
1 September 2009 to 30 June 2012	Digby Wells Environmental	Environmental GIS Specialist
1 January 2008 to 31 August 2009	Statistics South Africa, Geography Division	GIS Specialist – Geo-Database and Application Development
1 January 2007 to 31 December 2007	Statistics South Africa, Geography Division	Intern Professional
February 2006 to October 2006	Department of Geography, Environmental Management and Energy Studies, University of Johannesburg	Demonstrator for the First Year Geography Practical Lectures

5 Experience

I have experience in using Geographic Information Systems (GIS) as a digital cartographic and spatial analytical tool. As a GIS Specialist at Statistics South Africa I was responsible for maintaining the geodatabase and I gained experience working with vector data, aerial photography and satellite imagery. I was responsible for the data preparation and mapping for the Community Survey 2007 Digital Atlas CD. I assisted with map production for surveys and user requests for spatial data. I also worked on the Dwelling Frame Project, Placename and Enumerator Area Demarcation.

My responsibilities at Digby Wells currently include but are not limited to:

- Management of the GIS unit;

- Generation of maps for projects;
- Conducting Topography and Visual Impact Assessments (T&VIAs);
- Review of GIS maps and T&VIA Reports;
- Assisting with the maintenance of the GIS databases by storing all electronic files in a well organised structure;
- Expanding and improving the GIS databases by identifying gaps and sources of additional mapping data;
- The production of spatial information in map format;
- Application of GPS technology, aerial photo and satellite images.
- Assessing digital databases to ensure a high level of accuracy of data available at all times; and
- Spatial analyses relating to environmental projects.

6 Project Experience

My project experience at Digby Wells includes but is not limited to:

Year	Client	Project	Responsibility	Location
2015	Anker Coal	Elandsfontein and Golfview Baseline Studies	Mapping	Mpumalanga, South Africa
2015	Anker Coal	Elandsfontein and Golfview Closure Cost Assessments	3D modelling and closure calculations Mapping	Mpumalanga, South Africa
2015	Anker Coal	Elandsfontein and Golfview IWULAs	Mapping	Mpumalanga, South Africa
2015	Anker Coal	Golfview Rehabilitation Plan	3D modelling and volume calculations Mapping	Mpumalanga, South Africa
2015	BECSA (South 32)	KPSX: Weltevreden EIA	Topography and Visual Impact Assessment Supervise mapping	Mpumalanga, South Africa
2015	CDC Group	Fauna and Flora, and Social Studies	Data compilation Mapping	DRC

Year	Client	Project	Responsibility	Location
2015	Fountain Capital	Oakleaf Open Pit Coal Mine EIA	Assist with Topography and Visual Impact Assessment Supervise mapping	Gauteng, South Africa
2015	Gold One	Sibanye WRTRP EIA	Topography and Visual Impact Assessment Supervise mapping	Gauteng, South Africa
2015	Harmony Gold	Closure Cost Assessment 2015	3D modelling and closure calculations Supervise mapping	Free State, Gauteng and North West, South Africa
2015	Lanxess Mining	Lanxess Chrome Mine Section 102 EMP Amendment	Topography and Visual Impact Assessment Mapping	North West, South Africa
2015	Pamish Investments	Magnetite EIA	Topography and Visual Impact Assessment Mapping	Limpopo, South Africa
2015	Sasol Mining	Sigma Interactive Map and Document Management System	Project Manager	Mpumalanga, South Africa
2014	AECOM	EIA for Management of AMD from the Eastern Basin	Assist with Topography and Visual Impact Assessment Supervise mapping	Gauteng, South Africa
2014	BECSA (South 32)	KPSX: South EIA	Topography and Visual Impact Assessment Supervise mapping	Mpumalanga, South Africa
2014	Ergo	Pipeline GIS Audit	Project Manager	Gauteng, South Africa
2014	Exxaro	Tshikondeni Closure Plan	Mapping	Limpopo, South Africa

Year	Client	Project	Responsibility	Location
2014	Genesis Analytics	Evaluation of Environmental Governance	Interviews, Research and Report Compilation	South Africa
2014	Glencore Xstrata	Tavistock EMP	Mapping	Mpumalanga, South Africa
2014	Harmony Gold	Closure Cost Assessment 2014	3D modelling and closure calculations Supervise mapping	Free State, Gauteng and North West, South Africa
2013	Amara Sega	Cluff Sega RAP	Data compilation Mapping	Burkina Faso
2013	Anglo American Thermal Coal	Dalyshope Coal Mine EIA	Topography and Visual Impact Assessment Mapping	Limpopo, South Africa
2013	Aureus Mining Inc	New Liberty Gold Mine RAP	Questionnaire design Data compilation and analysis Mapping	Liberia
2013	Glencore Xstrata	GIS Phase 2 Project	Project Manager	Mpumalanga, South Africa
2013	Glencore Xstrata	Closure Cost Assessment 2013	3D modelling and closure calculations Supervise mapping	Mpumalanga, South Africa
2013	Harmony Gold	Closure Cost Assessment 2013	3D modelling and closure calculations Supervise mapping	Free State, Gauteng and North West, South Africa
2013	Platreef Resources	Platreef EIA	Topography and Visual Impact Assessment Mapping	Limpopo, South Africa
2013	Rhodium Reefs	Rhodium Reefs EIA	Topography and Visual Impact Assessment	Limpopo, South Africa

Year	Client	Project	Responsibility	Location
2013	Vedanta	Vedanta IPP EIA	Topography and Visual Scoping Study Mapping	Limpopo, South Africa
2012	Bokoni Platinum Mine	Bokoni Water Balance	Mapping	Limpopo, South Africa
2012	Platreef Resources	Platreef Agricultural Survey	Project Manager Data compilation Mapping	Limpopo, South Africa
2012	Platreef Resources	Platreef Skills and Business Survey	Project Manager Digital survey methodology Data compilation and analysis	Limpopo, South Africa
2012	Xstrata Coal	Closure Cost Assessment 2012	3D modelling and closure calculations Supervise mapping	Mpumalanga, South Africa
2012	Xstrata Coal	Consolidated EIA EMP for Tavistock	Mapping	Mpumalanga, South Africa
2011	DRD Gold	Crown Knights Reclamation of Sand Dump 4/A/6 (Lycaste)	Topography and Visual Impact Assessment Mapping	Gauteng, South Africa
2011	DRD Gold	Crown Pipeline Audit	Mapping	Gauteng South Africa
2011	DRD Gold	Crown Consolidated EMP	Mapping	Gauteng, South Africa
2011	Koidu	Koidu RAP	Questionnaire design Data compilation and analysis	Sierra Leone
2011	Rand Gold	Gounkoto RAP	Fieldwork Mapping	Mali

Year	Client	Project	Responsibility	Location
2011	ResGen	Boikarabelo Railway EIA	Topography and Visual Impact Assessments	Limpopo, South Africa
2011	ResGen	Boikarabelo Power Station EIA	Topography Impact Assessment Mapping	Limpopo, South Africa
2011	Temo Coal	Temo Coal Mine EIA	Topography and Visual Impact Assessments	Limpopo, South Africa
2011	Universal Coal	Brakfontein Social and Environmental Screening Study	Mapping	Mpumalanga, South Africa
2011	Universal Coal	Roodekop EIA	Mapping	Mpumalanga, South Africa
2011	Xstrata Coal	Closure Cost Assessment 2011	3D modelling and closure calculations Mapping	Mpumalanga, South Africa
2011	Xstrata Alloys	Lesedi Power Station EIA	Topography Impact Assessment Mapping	Mpumalanga, South Africa
2010	DRD Gold	Crown Pipeline EIA	Mapping	Gauteng, South Africa
2010	DRD Gold	Crown City Deep Reclamation of Slimes Dam 4/L/2	Mapping	Gauteng, South Africa
2010	DRD Gold	Crown City Deep Reclamation of Slimes Dams 3/L/40 & 3/L/42	Mapping	Gauteng, South Africa
2010	Galaxy Gold	Galaxy Gold Mine EIA	Topography and Visual Impact Assessments Mapping	Mpumalanga, South Africa

Year	Client	Project	Responsibility	Location
2010	HCI Coal	Nokuhle Colliery EIA	Topography Impact Assessment Mapping	Mpumalanga, South Africa
2010	HCI Coal	Palesa Extension EIA	Topography and Visual Impact Assessments Mapping	Mpumalanga, South Africa
2010	Mmamabula	Mookane Domestic Power Project	Mapping	Botswana
2010	ResGen	Boikarabelo Coal Mine EIA	Mapping	Limpopo South Africa
2010	Xstrata Coal	Closure Cost Assessment 2010	3D modelling and closure calculations Mapping	Mpumalanga, South Africa
2010	Xstrata Coal	Zonnebloem Colliery EIA	Mapping	Mpumalanga, South Africa
2009	BHP Billiton	Naudesbank & Vaalbank Baseline Studies	Mapping	Mpumalanga, South Africa
2009	MSA	Nkwe Social Survey	Mapping	Limpopo, South Africa
2009	Sasol Mining	Syferfontein Colliery EIA	Mapping	Mpumalanga, South Africa
2009	Universal Coal	Kangala Coal Mine EIA	Mapping	Mpumalanga, South Africa
2009	Xstrata Coal	Community Baseline Survey	Data analysis Mapping	Mpumalanga, South Africa
2009	Xstrata Coal	Tavistock EMPR	Mapping	Mpumalanga, South Africa

7 Professional Affiliations

Geographic Information Society of South Africa (GISSA)

Appendix C: Plans

Plan 1: Regional Setting

Plan 2: Local Setting

Plan 3: Infrastructure Layout

Plan 4: Topographical Model

Plan 5: Slope Model

Plan 6: Aspect Model

Plan 7: Theoretical Viewshed Model

Plan 8: Practical Viewshed Model

Plan 9: Makapan Valley WHS Theoretical Viewshed Model

Plan 1

Ivanplats (Pty) Ltd

Regional Setting



Legend

- Mining Right Area
- Active Mine
- Proposed Mine
- City
- Secondary Town
- Other Town
- Settlement
- Main Road
- National Road
- Railway Line
- River
- Dam
- Local Municipal Boundary
- Makapan Vally WHS Core Area
- Makapan Valley WHS Buffer
- Protected Area
- Important Bird Area (Birdlife, 2013)

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N

0 5 10 20

Kilometres

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Plan 2

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Local Setting

28°55'0"E 29°0'0"E 29°5'0"E

24°0'0"S 24°5'0"S 24°10'0"S

Anglo Platinum Mogalakwena Platinum Mine
Witvinger Nature Reserve
H. L. Crause Private Nature Reserve
Glenesk Private Nature Reserve
Mogalakwena Local Municipality
Lepele-Nkumpi Local Municipality

N11 R518 R101 N1

Ga-Machikiri
Mapela
Sandsloot
Pholotsi Ga-Mabusela
Pholotsi Ga-Masenya
Ga-Mokaba
Magongoa
Baloi
Macheke
Hlonguane
Ga-Mmalepeteke
Ga-Sekgoboko
Ga-Kgobudi
Mzombane
Masodi
Madiba
Mahwelereng B
Masehlaneng
Maroteng
Mahwelereng
Mahwelereng A
Mahwelereng C
Mountain View
Moshate
Michelle
Parkmore
Phola Park
Sekgakgapeng
Sekgakgapeng Ext 1
Mokopane

KLEIN-SANDSLOOT
PHOLOTSI
MOGALAKWENA
DITHOKENG
ROOISLOOT
NGWADITSE
NYLRIVIER
DORPSRIVIER

Legend

- Mining Right Area
- Amended Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Local Municipal Boundary
- Makapan Valley WHS Buffer
- Protected Area

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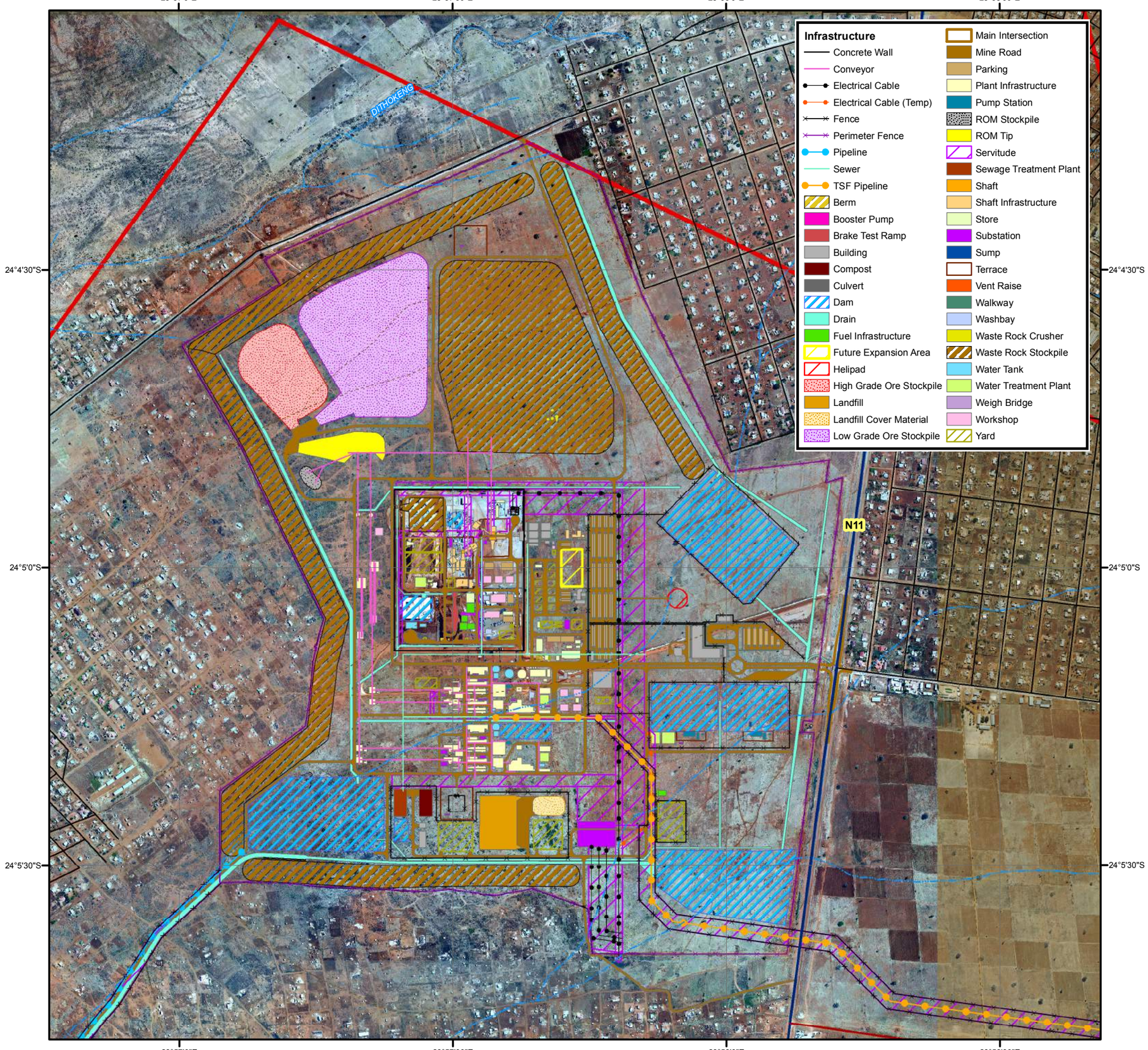
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Plan 3

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Infrastructure Layout



Legend

- Mining Right Area
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream

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Plan 4

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Topographical Model

28°50'0"E 28°55'0"E 29°0'0"E 29°5'0"E

24°0'0"S 24°5'0"S 24°10'0"S

KLEIN-SANDSLOOT
MOHLOSANE
GROOT-SANDSLOOT
PHOLOTSI
DITHOKENG
MOGALAKWENA
ROOISLOOT
NGWADITSE
NYLRIVIER
DORPSRIVIER

N11 R518 N1

Ga-Masenya
Ga-Molekana
Ga-Machikiri
Mapela
Sandsloot
Pholotsi
Ga-Mabusela
Pholotsi
Ga-Masenya
Ga-Mokaba
Sterkwater
Magongoa
Baloi
Macheke
Hlonguane
Ga-Mmalepeteke
Ga-Sekgoboko
Ga-Kgobudi
Mzombane
Masodi
Madiba
Mahwelereng B
Masehlaneng
Maroteng
Mahwelereng
Mahwelereng A
Mahwelereng C
Mountain View
Moshate
Michelle
Parkmore
Phola Park
Sekgakgapeng
Sekgakgapeng Ext-1
Mokopane

Legend

- Mining Right Area
- Amended Infrastructure Area
- 10km Buffer of Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland

Topographical Model

Elevation (m.a.m.s.l.)

High : 1827

Low : 1001

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Plan 5

Ivanplats (Pty) Ltd

Slope Model

28°50'0"E 28°55'0"E 29°0'0"E 29°5'0"E

24°0'0"S 24°5'0"S 24°10'0"S

KLEIN-SANDSLOOT
MOHLOSANE
GROOT-SANDSLOOT
PHOLOTSI
DITHOKENG
MOGALAKWENA
ROOISLOOT
NGWADITSE
NYLRIVIER
DORPSRIVIER

N11
R518
N1

Ga-Masenya
Ga-Molekana
Ga-Machikiri
Mapela
Sandsloot
Pholotsi
Ga-Mabusela
Pholotsi
Ga-Masenya
Ga-Mokaba
Sterkwater
Magongoa
Baloi
Macheke
Hlonguane
Ga-Mmalepeteke
Ga-Sekgoboko
Ga-Kgobudi
Mzombane
Masodi
Madiba
Mahwelereng B
Masehlaneng
Maroteng
Mahwelereng
Mahwelereng A
Mountain View
Mahwelereng C
Moshate
Michelle
Parkmore
Phola Park
Sekgakgapeng
Sekgakgapeng Ext 1
Mokopane

Legend

- Mining Right Area
- Amended Infrastructure Area
- 10km Buffer of Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland

Slope Model

Degree (°)

- 0 - 2.29
- 2.3 - 6.11
- 6.12 - 11.19
- 11.2 - 17.04
- 17.05 - 23.66
- 23.67 - 31.8
- 31.81 - 64.87

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Plan 6

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Aspect Model

28°50'0"E 28°55'0"E 29°0'0"E 29°5'0"E

24°0'0"S 24°5'0"S 24°10'0"S

KLEIN-SANDSLOOT
MOHLOSANE
GROOT-SANDSLOOT
PHOLOTSI
DITHOKENG
MOGALAKWENA
NGWADITSE
ROOISLOOT
NYLRIVIER
DORPSRIVIER

Ga-Masenya
Ga-Molekana
Ga-Machikiri
Mapela
Sandsloot
Pholotsi
Ga-Mabusela
Pholotsi
Ga-Masenya
Ga-Mokaba
Sterkwater
Magongoa
Baloi
Macheke
Hlonguane
Ga-Mmalepeteke
Ga-Sekgoboko
Ga-Kgobudi
Mzombane
Masodi
Madiba
Mahwelereng B
Masehlaneng
Maroteng
Mahwelereng
Mahwelereng A
Mountain View
Moshate
Mahwelereng C
Michelle
Parkmore
Phola Park
Sekgakgapeng
Sekgakgapeng Ext 1
Mokopane

N11
R518
N11
R518
N1

Legend

- Mining Right Area
- Amended Infrastructure Area
- 10km Buffer of Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland

Aspect Model

- Flat (-1)
- North (0-22.5)
- Northeast (22.5-67.5)
- East (67.5-112.5)
- Southeast (112.5-157.5)
- South (157.5-202.5)
- Southwest (202.5-247.5)
- West (247.5-292.5)
- Northwest (292.5-337.5)
- North (337.5-360)

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Plan 7

Ivanplats (Pty) Ltd

Theoretical Viewshed Model

28°50'0"E 28°55'0"E 29°0'0"E 29°5'0"E

24°0'0"S 24°5'0"S 24°10'0"S

KLEIN-SANDSLOOT
MOHLOSANE
GROOT-SANDSLOOT
DITHOKENG
ROOISLOOT
NGWADITSE
MOGALAKWENA
NYLRIVIER
DORPSRIVIER
PHOLOTSI

N11
R518
N1

GA-MASENYA
GA-MOLEKANA
GA-MACHIKIRI
PHOLOTSI SANDSLOOT
PHOLOTSI GA-MABUSELA
PHOLOTSI GA-MASENYA
GA-MOKABA
BALOI
MAGONGOA
MACHEKE
HLONGUANE
GA-MMALEPETEKE
GA-SEKGOBOKO
GA-KGOBUDI
MZOMBANE
MASODI
MADIBA
MASEHLANENG
MAHWELERENG
MAROTENG
MOSHATE
MOUNTAIN VIEW
MICHELLE
PHOLAR PARK
PARKMORE
SEKGAKGAPENG
MOKOPANE

Witvinger Nature Reserve
Glenesk Private Nature Reserve

Legend

- Mining Right Area
- Amended Infrastructure Area
- 10km Buffer of Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Residential Area
- Protected Area

Theoretical Viewshed Model

- Not Visible
- Potentially Visible

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Plan 8

Ivanplats (Pty) Ltd

Practical Viewshed Model

28°50'0"E 28°55'0"E 29°0'0"E 29°5'0"E

24°0'0"S 24°5'0"S 24°10'0"S

KLEIN-SANDSLOOT
MOHLOSANE
GROOT-SANDSLOOT
GA-MASENYA
GA-MOLEKANA
N11
Witvinger Nature Reserve
GA-MACHIKIRI
PHOLOTSI GA-MABUSELA
SANDSLOOT
PHOLOTSI
PHOLOTSI GA-MASENYA
GA-MOKABA
DITHOKENG
BALOI
MAGONGOA
MACHEKE
GA-MMALEPETEKE
GA-SEKGOBOKO
HLONGUANE
GA-KGOBUDI
R518
N11
MZOMBANE
MOGALAKWENA
MASODI
MADIBA
ROOISLOOT
MASEHLANENG
MAHWELERENG
MAROTENG
NGWADITSE
MOSHATE
MOUNTAIN VIEW
Glenesk Private Nature Reserve
MICHELLE
PHOLAR PARK
PARKMORE
DORPSRIVIER
NYLRIVIER
SEKGAKGAPENG
MOKOPANE
R518
N1

Legend

- Mining Right Area
- Amended Infrastructure Area
- 10km Buffer of Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Residential Area
- Protected Area

Practical Viewshed Model

- 0 - 5 km: Potentially High Visual Exposure
- 5 - 8 km: Potentially Moderate Visual Exposure
- 8 - 10 km: Potentially Low Visual Exposure

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Plan 9

Ivanplats (Pty) Ltd

Makapan Valley WHS Theoretical Viewshed Model

Legend

- Mining Right Area
- Amended Infrastructure Area
- 10km Buffer of Infrastructure Area
- Stormwater Drain Servitude (New)
- TSF Pipeline Servitude (Amended)
- Secondary Town
- Other Town
- Settlement
- Main Road
- National Road
- Railway Line
- River
- Dam
- Protected Area
- Makapan Vally WHS Core Area
- Makapan Valley WHS Buffer
- Makapan Valley WHS Buffer within Practical Viewshed

Theoretical Viewshed Model

- Not Visible
- Potentially Visible

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Projection: Transverse Mercator
Datum: Hartebeesthoek 1994
Central Meridian: 29°E

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Revision Number: 1
Date: 21/12/2015

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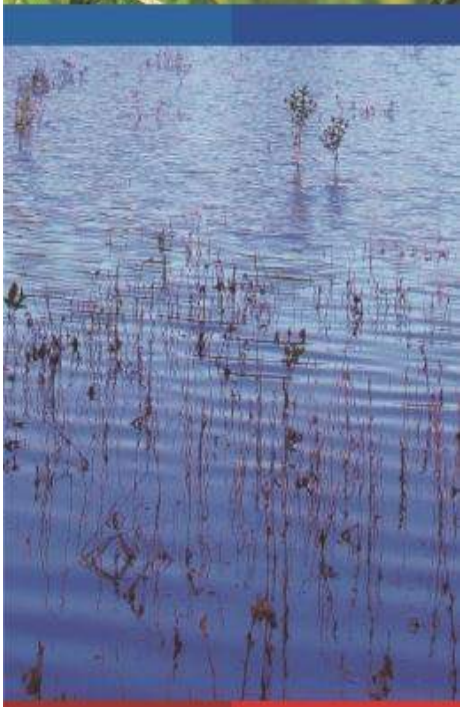
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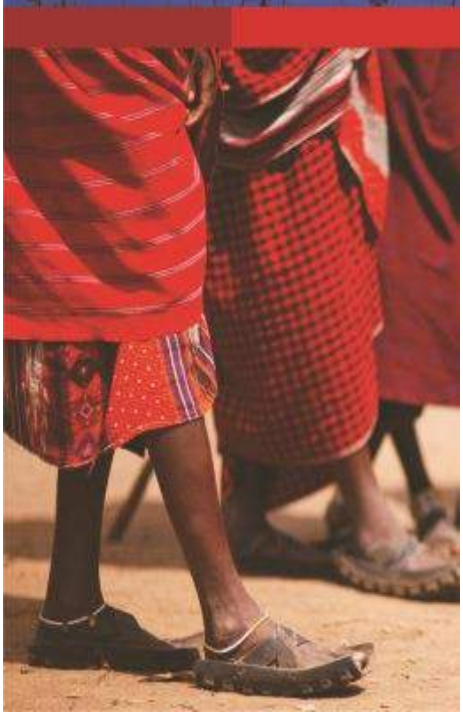
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Appendix E: Addendum Air Quality Impact Assessment Report







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Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province

Air Quality Impact Assessment Addendum Report

Project Number:

IVA3396

Prepared for:

Ivanplats (Pty) Ltd

February 2016

Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: AJ Reynolds (Chairman) (British)*, GE Trusler (C.E.O), B Beringer, LF Koeslag, J Leaver*, NA Mehlomakulu, DJ Otto
*Non-Executive

This document has been prepared by Digby Wells Environmental.

Report Type:	**Air Quality Impact Assessment Addendum Report**
Project Name:	**Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province**
Project Code:	**IVA3396**

Name	Responsibility	Signature	Date
Matthew Ojelede	Report Writer		January 2016
Danie Otto	Technical Reviewer		January 2016

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EXECUTIVE SUMMARY

Ivanplats (Pty) Ltd (hereafter Ivanplats) wishes to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (the Project). Digby Wells Environmental (hereafter Digby Wells) was requested by Ivanplats to conduct an Environmental Impact Assessment (EIA) and provide an Environmental Management Plan (EMP) for the amendments to the original Project footprint and location of certain activities/infrastructure i.e. additional roads, inclusion of the diesel generators, amending the volume of stockpiles and the inclusion of aboveground waste rock crushers. This Air Quality Impact Assessment (AQIA) is amongst a suite of specialist studies needed to assess impacts associated with these amendments.

A detailed assessment was conducted in 2013 which encompasses a suite of specialist studies to support Ivanplats application for environmental authorisation to development the proposed mine, hence this report is limited to aspects that are associated with the infrastructural changes that occurred thereafter. An emissions inventory was established comprising emissions mainly from the operational phase of the Project. Results from the emission inventory analysis served as input data for the dispersion model simulations. This inventory calculated emission rates for the following pollutants: PM_{10}, $PM_{2.5}$, CO, SO_2 and NO_2 respectively. Model predictions showed that emissions from the crushers and haul roads are the main contributors to dust deposition, PM_{10} and $PM_{2.5}$. While gaseous emissions such as CO, SO_2 and NO_2 were solely from the diesel generators. The main findings of this AQIA study are summarised as follows:

- Predicted PM_{10} levels are high in the Project area and surroundings respectively. The predicted concentrations at five receptor sites were in exceedance of the current standard (75 µg/m3) without mitigation measures in place.
- The levels of $PM_{2.5}$ predicted for the project area are higher than the current South African standards (40 µg/m^3). However, with appropriate mitigation applied, ambient concentrations of this pollutant can be further lowered.
- Dust deposition rates predicted for the proposed Platreef Mine are high with emissions from dirt roads and crushing being the largest contributors. However, model predictions show that only site PLA6 (Ga-Kgobudi) will be in exceedance after mitigation measures were applied.

For the gaseous pollutants from the diesel generators (<10 MW) as a source of air pollution:

- The predicted NO_2 concentrations simulated at the proposed mining area are high. The hourly concentration exceeded the current limit (200 µg/m^3) at the western and southern boundary.
- Predicted annual concentrations of NO_2 are within the South African standard (40 µg/m^3), within the project area and beyond.

- The 1-hour SO_2 concentrations predicted at the proposed mining area are higher than the recommended South African standard of 350 µg/m^3 at the western and southern boundary.
- The 24-hours predicted concentrations of SO_2 are within the South African standard of 125 µg/m^3. Predicted concentrations at sensitive receptors were within limit.
- The predicted annual concentrations of SO_2 are within the South African standard 50 µg/m^3 at the mine boundary and selected sensitive receptors.
- The predicted maximum hourly concentrations of CO are within the regulatory limit value. No exceedance of the South African standard of 30,000 µg/m^3 was predicted.

It is recommended that all proposed crushers be enclosed with dust extraction systems and fitted with water sprays that dust suppressants are used on roads and exposed areas, that selective catalytic technology and gas scrubbers are used for the generators, all of which will result in emission levels meeting regulatory compliance.

In view of the findings of the study, the following should be factored into the monitoring programme: Good housekeeping on the part of the personnel, implementation of the recommended mitigation measures suggested in the day to day operation, coupled with ambient monitoring of gases and particulates on-site and off-site.

It is recommended that mine management commit to emission reduction strategies aimed at ameliorating potential impacts and ensure compliance with regulatory requirements.

LIST OF ABBREVIATIONS

AQIA	Air Quality Impact Assessment
ASTM	American Society for Testing and Materials
EIA	Environmental Impact Assessment
DMR	Department of Mineral Resources
EMP	Environmental Management Plan
GN	Government Notice
MM5	Mesoscale model - Fifth generation
NAAQS	National Ambient Air Quality Standard
NDCR	National Dust Control Regulation
NEM:AQA	The National Environmental Management: Air Quality Act
PM_{10}	Particulate Matter less than 10 microns in diameter
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
SANS	South African National Standards
USEPA	United States Environment Protection Agency
TSP	Total Suspended Particulates

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1 Introduction

1.1 Project Background

Ivanplats (Pty) Ltd (hereafter Ivanplats) wishes to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (the Project).

The Project is located on the Northern Limb of the Bushveld Igneous Complex (BIC), approximately 280 km northeast of Johannesburg and 8 km northwest of the town of Mokopane (formerly known as Potgietersrus) in Limpopo Province of South. The Project is located on the farms Macalacaskop 243 KR and Turfspruit 241 KR with the construction of a Tailings Storage Facility (TSF) on the farm Rietfontein 2 KS.

Ivanplats is the holder of a Mining Right, issued by the Department of Mineral Resources (DMR) on 04 November 2014, and associated Environmental Authorisation and Waste Management Licence issued by the Limpopo Department of Economic Development, Environment and Tourism and the Department of Environmental Affairs respectively, dated 27 June 2014 and 13 March 2015. Since the granting of the above-mentioned licences, Ivanplats has commenced with the sinking or development of Shaft 1. In addition, certain mine infrastructure has been established to support the sinking of Shaft 1, including the mine's access road, a mine boundary fence and temporary facilities such as workshops and offices.

Prior to the installation of the mine boundary fence and during site establishment, the planned mine infrastructure area which covered an approximate 420 hectares (ha) was encroached on by surrounding communities. The encroachment resulted in a reduction of the total mining area footprint by up to 74 ha. As a result of the encroachment, Ivanplats was required to revise the mine layout plan by amending the footprint and/or location of certain activities/infrastructure.

Digby Wells Environmental has been appointed by Ivanplats to review these amendments and identify and assess any additional impacts that may result from these amendments. This Air Quality Impact Assessment (AQIA) specialist report therefore serves as an addendum to the existing specialist report compiled for the Platreef Project (October 2013).

1.2 Terms of Reference

Digby Wells was required to assess potential impacts associated with the proposed amendments to the Project footprint and location of certain activities/infrastructure. The Terms of Reference (ToR) encompasses a completion of an AQIA report based on available modelled data and air quality data from previous study measured around the Project area.

As part of the ToR, the following was conducted:

- Emissions inventory of anticipated pollutants based on the mining, processing and ancillary activities at the mine.
- Development of a dispersion model based on atmospheric conditions and emission inventory data.

In addition, Digby Wells was required to provide recommendations regarding appropriate monitoring programme action plans tailored to ameliorate impacts, followed by the mitigation and management plans.

1.3 Aims and Objectives

The overall aim of the AQIA study was to establish the impacts on air quality due to the Project and related activities. To achieve this aim, the following objectives were undertaken:

- To identify all potential sources of pollution within the Project area;
- To identify all sensitive receptors in the vicinity of the Project;
- To assess all air quality monitoring data available, including an in-depth analysis of latest legislative and regulatory context, emission limits, ambient air quality guidelines and threshold values; and
- Assess predicted impacts against current standards governing identified pollutants from the proposed Project.

2 Specialist Details

Matthew Ojelede completed his B.Sc. (Hons) degree at the University of Benin; an M.Sc. in Environmental Science (Wits University) and a Ph.D. in Environmental Management from the University of Johannesburg. He has been in the Atmospheric Research field since 2005 and now actively involved in atmospheric dispersion modeling and emissions inventories compilation. He has authored and co-authored several research articles in peer reviewed journals and compiled dispersion modeling impact assessments reports. A curriculum vitae (CV) and declaration of independence is attached in Appendix A.

3 Methodology

3.1 Desktop Assessment

The desktop assessment comprised a review of current air quality data supplied by the mine – PM_{10} and dust deposition data (with a review of the existing dust monitoring point conducted). Since the commissioning of the dust monitoring points, there have been many changes in the area, hence the decision to revise the dust monitoring locations to reflect current scenarios. Climate data from Lakes Environmental was reassessed to confirm the

dominant wind direction. Surrounding receptors likely to be impacted were reviewed based on the current Project footprint.

Ivanplats currently has an established dust monitoring network and a PM_{10} monitor within the Project area. In addition, a comprehensive baseline report was conducted previously for the Project (Digby Wells Environmental, AQIA Report, October 2013), the findings of which are still valid. Hence, it was not necessary to conduct additional fieldwork.

3.2 Baseline Environment

In the previous study (Digby Wells Environmental, AQIA Report, October 2013), the baseline meteorology was detailed and comprehensive, hence will not be revised and/or reported on in this report. Data from the existing dust monitoring network and ambient particulate matter monitor (PM_{10}) was provided. Dust deposition data for August, September and October 2015 was provided alongside PM_{10} for the year 2015.

3.2.1 Meteorological parameter

3.2.1.1 Wind Speed

Wind field plays a vital role in the erosion, dispersion and deposition of fugitive dust, i.e. the generation potential, the extent dust can travel downwind and the dilution potential. The amount of dust mobilised at any given location at any given period is a function of the frequency and duration of the wind events. A detailed description of this parameter was provided in the previous AQIA Report (October 2013), however is reiterated briefly in this report for emphasis since this is a crucial aspect in wind erosion of exposed surfaces.

The predominant wind direction is from northeast, with the secondary contributions from the east northeast and east respectively (Figure 3-1). Contributions from the northeast and southeast quadrant are dominant. Calm conditions (wind speeds < 0.5 m/s) occurred for 4.2 % of the time. Table 3-1 shows the wind class frequency distribution for the area. Wind speed capable of causing erosion occurred 14.4% of the time. The latter is equivalent to 51 days of high wind speed capable of causing erosion in a year. This is twice the scenario observed in some areas.

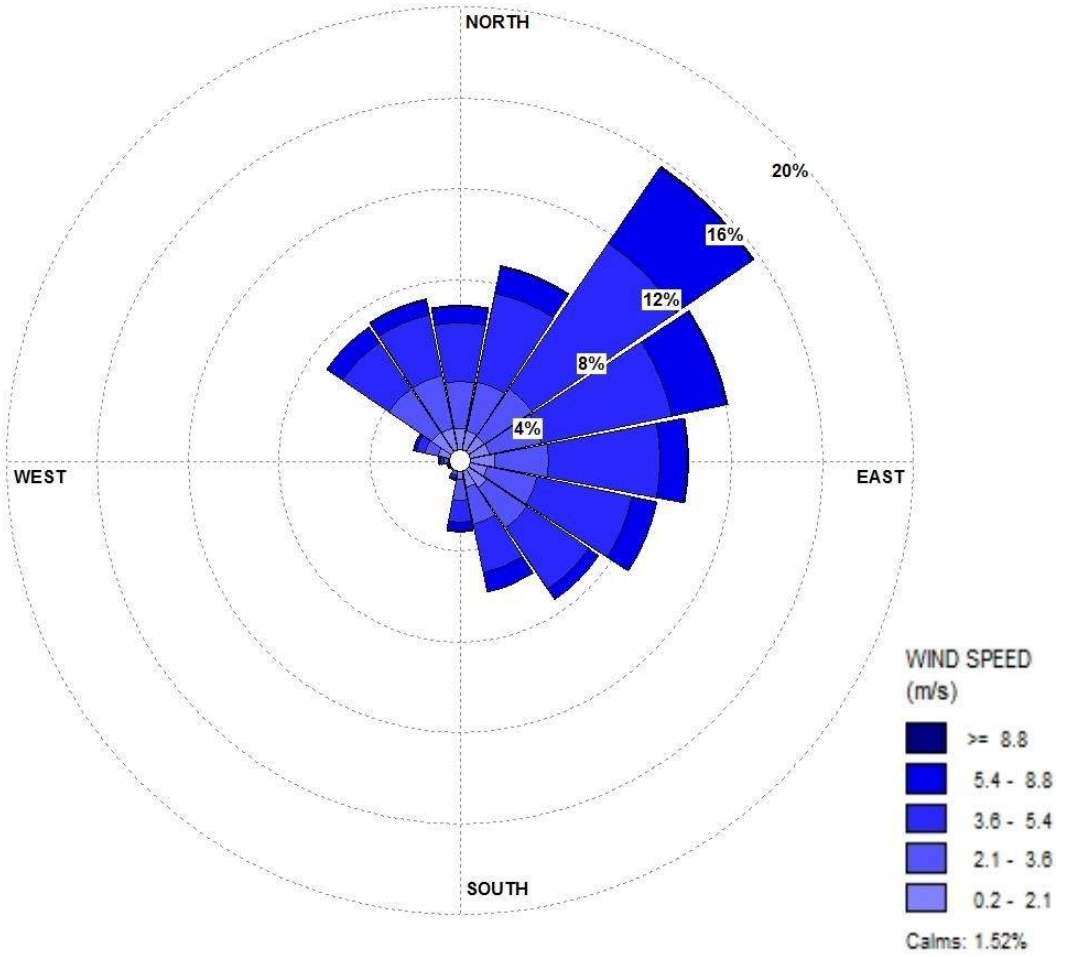
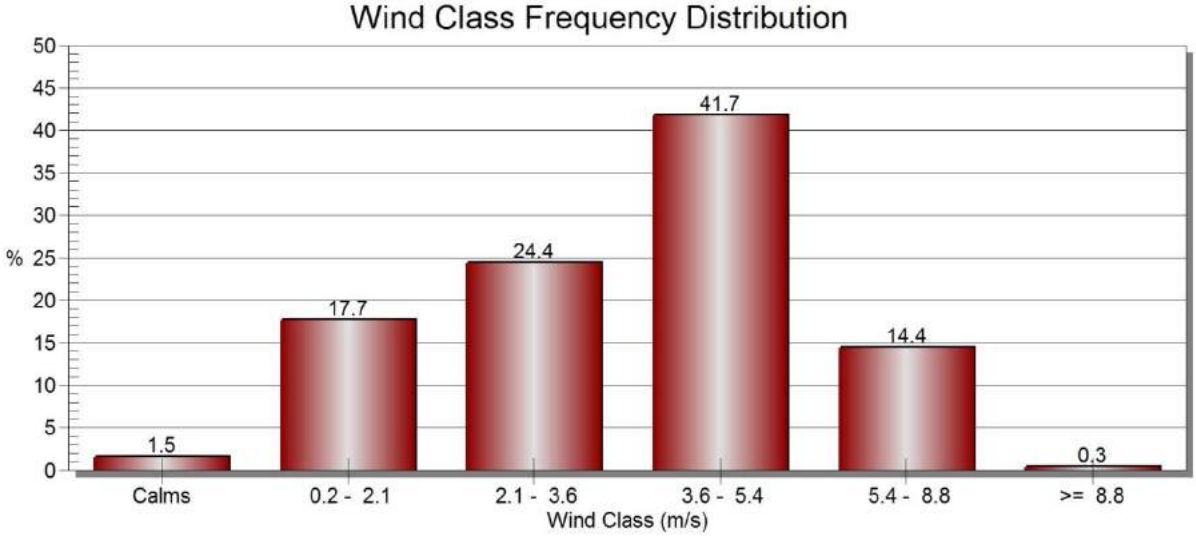


Figure 3-1: Surface wind rose – Ivanplast Project area

Table 3-1: Wind class frequency – Ivanplast Project area



3.2.1.2 Precipitation

As shown in Figure 3-2, for the period 2009-2012, the total monthly rainfall from January to December is presented. The annual total and average of 1021 mm and 719 mm are reported respectively, for the Project area.

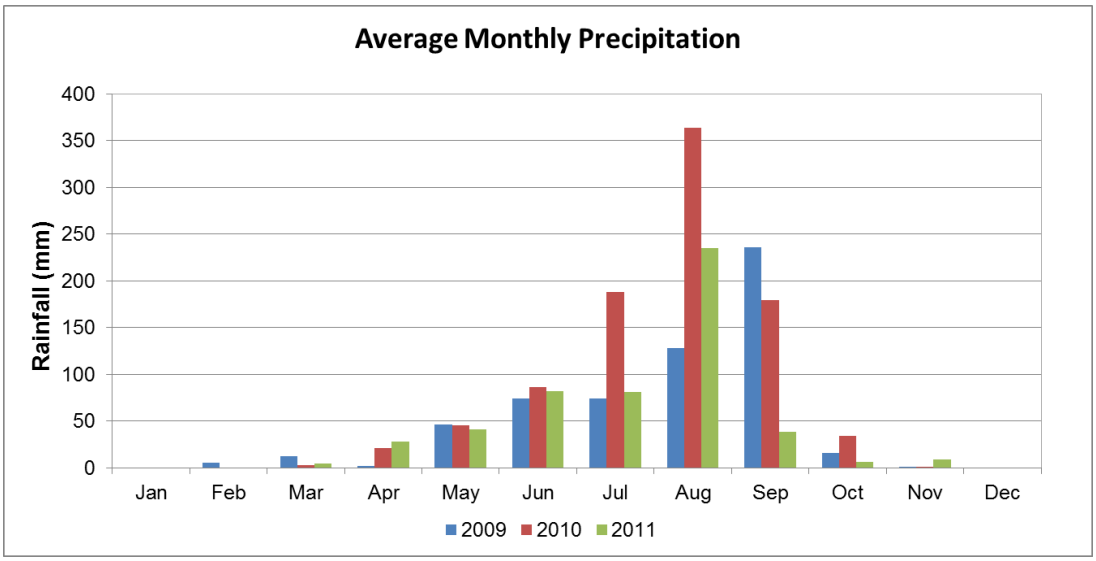


Figure 3-2: Average monthly precipitation

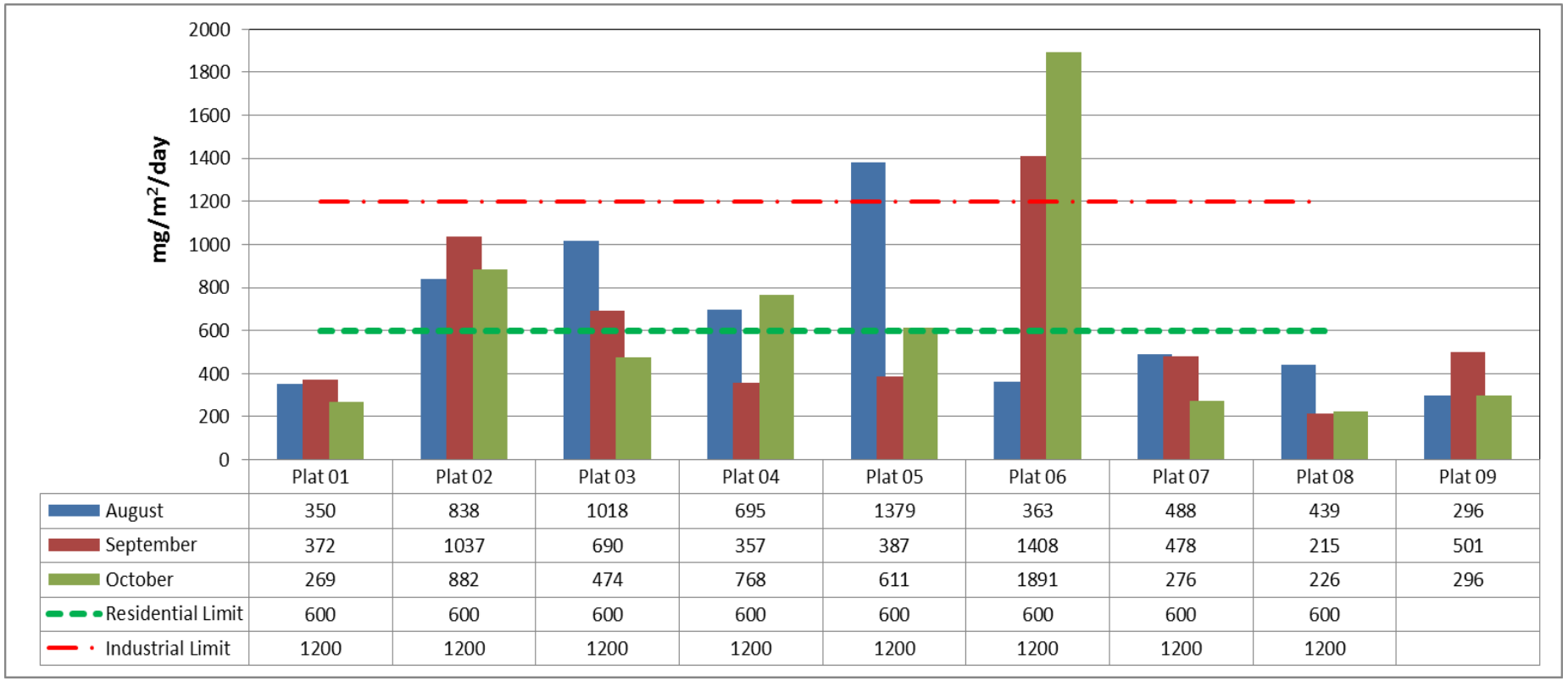
3.2.2 Air Quality

3.2.2.1 Dust Deposition

Dust fall rates were measured (using ASTM D1739:1970 or equivalent) in the vicinity of the proposed Ivanplats operations. Dust deposition rates from the monitoring network confirm that some sites are in violation of the National Environmental Management Air Quality Act; National Dust Control Regulations, 2013 (NEMAQA-NDCR) (GN R827 of 1 November 2013). Sites Plat 02 (Aug, Sep and Oct 2015) and Plat 03 (Sep and Oct 2015) were in exceedance of the residential limit (600 mg/m^2/day). At site Plat 06, the non-residential limit of 1200 mg/m^2/day was exceeded in Sep and Oct respectively (Figure 3-3). The recommended standards specified in NEMAQA-NDCR, 2013 stipulated two exceedances within a year, and it must not be sequential months.

3.2.2.2 PM_{10}

The PM_{10} data for 2015 was analysed and interpreted. The daily concentrations are generally below the current standard of 75 µg/m^3 for greater part of the year, with two exceedances only. These exceedances occurred in February and December of 2015 (Figure 3-4).



	Plat 01	Plat 02	Plat 03	Plat 04	Plat 05	Plat 06	Plat 07	Plat 08	Plat 09
August	350	838	1018	695	1379	363	488	439	296
September	372	1037	690	357	387	1408	478	215	501
October	269	882	474	768	611	1891	276	226	296
Residential Limit	600	600	600	600	600	600	600	600	
Industrial Limit	1200	1200	1200	1200	1200	1200	1200	1200	

Figure 3-3: Average monthly dust deposition rates

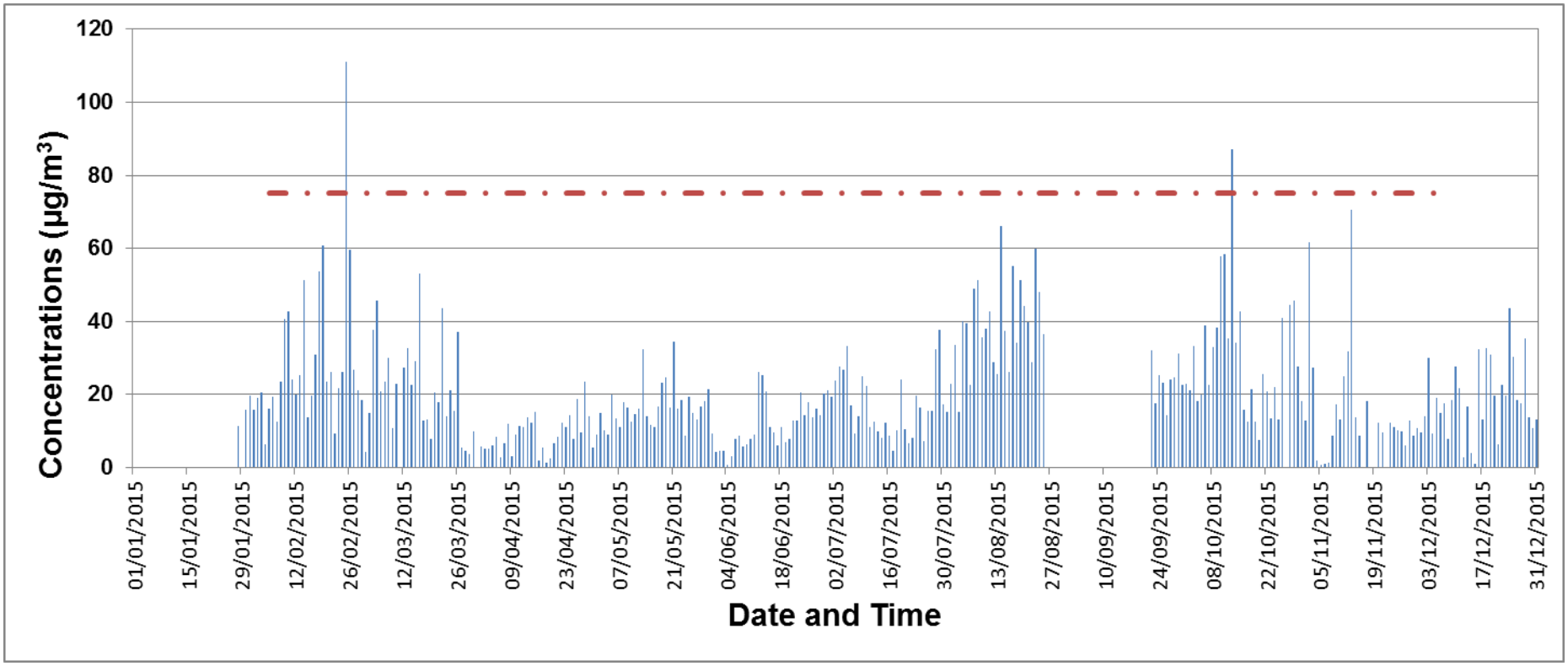


Figure 3-4: Average monthly PM_{10} concentrations

3.3 Emissions Inventory

The detailed infrastructural layout (2016) was utilised to develop an emissions inventory, which took cognizance of emission sources attributed to the Project. The emission equations from United States Environment Protection Agency (US EPA, 2006) and the Australian National Pollutant (NPI) were utilised to calculate emission factors that serve as inputs into the dispersion model.

The inventory included the following: location of all point, area, volume and line sources; types of pollutants and emission factors and proposed control measures to be adopted.

3.4 Dispersion Modelling

Dispersion models compute ambient concentrations as a function of source configurations, emission strengths and meteorological characteristics, thus providing a useful tool to ascertain the spatial and temporal patterns in the ground level concentrations arising from various sources within the proposed operation. All emission scenarios will be simulated using the US Environmental Protection Agency's Preferred/Recommended Models: AERMOD modelling system (as of December 9, 2006, AERMOD is fully promulgated as a replacement to ISC3 model). AERMOD modelling system incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.

Model results will predict contributions from the proposed Project on surrounding atmosphere and generate contour plots (maps) of ground level concentration zones per pollutant.

3.4.1 Modelling Domain

There are two input data processors that are regulatory components of the AERMOD modelling system:

- AERMET, a meteorological data pre-processor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts; and
- AERMAP, a terrain data pre-processor that incorporates complex terrain using USGS Digital Elevation Data.

Although the surrounding terrain is relatively flat, higher grounds are present in the landscape. Hence, the complex terrain module available in the model was used. The influence of the terrain will vary with the source height and position and the local meteorology. Table 3-2 gives an overview of meteorological parameters and basic setup options for the AERMOD model runs.

The AERMAP terrain pre-processor requires the user to define a modelling domain. The modelling domain is defined as the area that contains all the receptors and sources being modelled with a buffer to accommodate any significant terrain elevations.

AERMOD's three models and required model inputs are as follows:

- AERMET: calculates boundary layer parameters for input to AERMOD:
  - Model inputs: wind speed; wind direction; cover; ambient temperature; albedo; surface roughness; Bowen ratio.
- AERMAP: calculates terrain heights and receptor grids for input to AERMOD:
  - Model inputs: DEM data [x,y,z]; design of receptor grid (pol., cart., disc.); and
  - Model outputs for AERMOD: [x,y,z] and hill height scale for each receptor.
- AERMOD: calculates temporally-averaged air pollution concentrations at receptor locations for comparison to the relevant standard:
  - Model inputs: source parameters (from permit application); boundary layer meteorology (from AERMET); receptor data (from AERMAP).

Table 3-2: Summary of meteorological and AERMET parameters used for this study

Number of grids (spacing)	1 (250 m)
Number of grids points	81x81
Years of analysis	Jan 2009 to Dec 2011
Centre of analysis	Mokopane (24.095986 S, 28.968619 E)
Meteorological grid domain	20 km (east-west) x 20 km (south-north)
Meteorological grid cell resolution	20 km x 20 km
Station Base Elevation	1264 m
MM5-Processed Grid Cell (Grid Cell Centre)	24.095986 S, 28.968619 E
Anemometer Height	14 m
Sectors	The surrounding area land use type was considered to be residential
Albedo	0.28 (generated with the AERMOD Model – when the land use types are specified)
Surface Roughness	0.0725
Bowen Ratio	0.75
Terrain Option	Elevated

3.5 Analysis and Interpretation

Impacts were assessed based on the predicted maximum ground level concentrations generated by the model which were compared to regulatory standards at any point on the Project boundary and beyond.

It is noted that:

- The current standard was applied to all locations where members of the public may be exposed to the averaging periods (e.g. 1-hour, 24-hours, annual).

Analysis of dispersion model highlighted the following:

- Predicted zones of maximum ground level impacts (PM and Gases);
- Evaluation of potential for human health and environmental impacts; and
- Recommendations of impact management zones.

Once the areas of maximum impacts were identified, recommendations were provided regarding the mitigation measures to adopt. These recommendations should be incorporated into the day-to-day operation of the mine to prevent, control and abate emissions.

3.6 Operational Parameters Considered

To determine the maximum deposition rates and truck travel on internal access / haul road, the following factors were considered:

- The highest projected annual deposition rate and highest annual trip that will occur in a year for ore and waste rock;
- Material handling, tipping, loading and dumping of material;
- Transportation and crushing of ore and waste; and
- Erosion from various stockpiles.

3.7 Sources

3.7.1 Point Sources

The point sources considered are emissions from the vents and diesel generator stack. Stack specifications adopted for the generator point source was based on the design parameters from the manufacturers.

3.7.2 Volume Sources

Emissions from the crushers were modelled as volume sources. This encompasses the ore crushers and the waste crushers respectively.

3.7.3 Line Source

It was confirmed that 20% of the internal road was unpaved. Emissions due to hauling were modelled as line sources and the modelling parameters were based on guidance from AERMOD User's Guide.

The majority of emissions on the access road network will be due to large haul trucks. The height of the haul trucks was obtained from the manufacturer's data and the road width was estimated to be 10 metres. The speed of the dump truck and the mass load coupled with the number of wheels were also defined in the model.

3.7.4 Area Source

Fugitive emissions from topsoil, waste rock dump, material stockpiles were estimated prior to vegetation.

4 Evaluation of Dispersion Modelling Results

4.1 Isopleth Plots and Evaluation of Modelling Results

4.1.1 PM_{10}

4.1.1.1 PM_{10} Daily

The Isopleth showing different concentration zones for PM_{10} as a result of the operational phase of the proposed mine is presented in Figure 4-1. The predicted 24-hour (daily) concentrations show that the standard is exceeded at the four compass points with the worst cases at the western and southern boundary. In both cases the limit value (75 µg/m³) is exceeded several kilometres from the mine boundary. The major contributions are emissions from hauling and crushing of ore and waste. In terms of spatial impact, the western and south portions are affected most.

The predicted concentrations are the likely additions that can be anticipated from the proposed Mine on ambient air quality and not cumulative impact from all the existing sources in the area. The concentrations predicted at the various sensitive receptors are presented bellow (Table 4-1).

4.1.1.2 PM_{10} Annual

The Isopleth of predicted annual PM_{10} ground level concentration is presented in Figure 4-2. The predicted highest at the western boundary exceeded the current limit of 40 µg/m³ (it extends 1.4 km from the western boundary). The predicted concentrations at the selected sensitive receptors (represented as PLA) are presented in Table 4-1.

4.1.2 $PM_{2.5}$

4.1.2.1 $PM_{2.5}$ Daily

The Isopleth showing the predicted 99th percentile 24-hr (daily) ground level concentration of $PM_{2.5}$ at the proposed Ivanplats Mine is presented in Figure 4-3. The plot shows that exceedances at the mine boundary hence violating the current standard of 40 µg/m³. Concentrations predicted at the sensitive receptors are reported in Table 4-1.

4.1.2.2 $PM_{2.5}$ Annual

The annual ground level concentration of $PM_{2.5}$ is presented in Figure 4-4. The current ambient standard is exceeded some 468 m from the western boundary. All the receptor sites were within compliance of 20 µg/m³ limit without mitigation measures. Concentrations predicted at the sensitive receptors are reported in Table 4-1.

4.1.3 Dust Deposition

The predicted dust deposition rates anticipated from the proposed mine operation show that dust levels will be a cause for concern. The predicted deposition rate outside the mine boundary is higher than the 1 200 mg/m^2/day (NDCR, 2013) recommended for non-residential areas along the northern, western and southern boundary. Exposure will be higher along the haul road and adjacent areas and around the crushers (Figure 4-5). Once mitigation measures, such as using dust suppressant on haul roads, vegetation of stockpiles, and housing of crushers / water sprays were applied – deposition rates dropped (Table 4-1 and Figure 4-6).

It should be noted that isopleth plots reflecting monthly averaging periods contain only the highest predicted ground level concentrations for that averaging period, over the entire period for which simulations were undertaken. These isopleths are likely concentrations that the proposed mine would add on to existing ambient air quality and not a cumulative impact from all other sources. The dust deposition rate predicted for sensitive receptor PLA6 (Ga-Kgobudi) is higher than the non-residential limit of 1200 mg/m^2/day. The dust deposition rates predicted at the selected sensitive receptors are presented in Table 4-1.

Table 4-1: Comparison of predicted concentrations of PM_{10}, $PM_{2.5}$ and dust deposition at selected sensitive receptors with current standards

Pollutant	Averaging Period	Ambient Air Quality Standard ($\mu g/m^3$)	Levels at receptors ($\mu g/m^3$)							
			PLA1	PLA2	PLA3	PLA4	PLA5	PLA6	PLA7	PLA8
(PM_{10})	24 hour	75(1)	**140**	46	**78**	4.9	18	**603**	**201**	7.3
	Annual	40(1)	5.5	3.4	2.5	0.3	0.6	**63**	7.6	0.2
($PM_{2.5}$)	24 hour	40(1), 25(2)	36	25	19	2.9	6.5	**125**	47	2.4
	Annual	25(1), 15(2)	1.5	0.1	0.8	0.1	0.2	15	2.3	0.1
Dust fall (mg/m^2/day)										
Dust deposition	monthly	600(3)	131	79	71	32	85	**3912**	35	39
Dust deposition with mitigation	monthly	600(3)	54	31	26	13	33	**1778**	22	15

(1) National Ambient Air Quality Standards, 2009 (NAAQS)
(2) National Ambient Air Quality Standard for Particulate Matter With Aerodynamic Diameter Less Than 2.5 Microns Meter ($PM_{2.5}$).
(3) National Dust Control Regulation, 2013 (NDCS)

4.1.4 NO_2

The plots showing model predictions: 1-hourly and annual NO_2 concentrations (all NO_x assumed to be NO_2) are presented as Figure 4-7 and Figure 4-8. The 1-hour average simulation is higher than the SA standard (200 µg/m³). The predicted annual level is within the current standard (40 µg/m³). NO_2 emissions from the generator contributed the most to the total NO_2 concentrations.

4.1.5 SO_2

The plots of SO_2 1-hour, 24-hour and annual concentrations predicted from the proposed operation, primarily due to the use of diesel generators are presented in Figure 4-9, Figure 4-10 and Figure 4-11. The predicted 1-hour average shows that the exceedances of the limit (350 µg/m³) extended up to 348 m from the western boundary and 380 m from the southern boundary. The 24-hour ground level concentrations at sensitive receptors were within the current limit (125 µg/m³), exceedances observed were within the mine boundary. The predicted annual SO_2 concentrations are below the annual standard of 50 µg/m³.

4.1.6 Carbon Monoxide (CO)

Model simulation of 1-hour concentrations is presented in Table 4-2. The predicted 1-hour average CO maximum ground level concentrations were within the regulatory standard of 30,000 µg/m^3.

A summary of the model prediction for the proposed mine is presented in Table 4-2. The predicted concentrations for the different averaging periods were compared to the current standards to assess compliance.

Table 4-2: Comparison of predicted concentrations of NO_2, SO_2 and CO at selected sensitive receptors with current standards

Pollutant	Averaging Period	Ambient Air Quality Standard ($\mu g/m^3$)	Levels at receptors ($\mu g/m^3$)							
			PLA1	PLA2	PLA3	PLA4	PLA5	PLA6	PLA7	PLA8
NO_2	1 hour	200(1)	157	91	144	15	57	**264**	18	101
	Annual	40(1)	0.4	0.3	0.3	0.02	0,03	4.6	1.6	0.03
SO_2	1 hour	350(1)	165	70	151	5.1	8.9	251	71	5.5
	24 hour	125(1)	**9.2**	6.8	**7.1**	0.6	0.5	**35**	**21**	0.5
	Annual	50(1)	0.4	0.3	0.3	0.01	0.02	4.6	1.2	0.01
CO	1 hour	30000(1)	803	262	316	12	79	1066	1319	25

(1) National Ambient Air Quality Standards, 2009 (NAAQS)

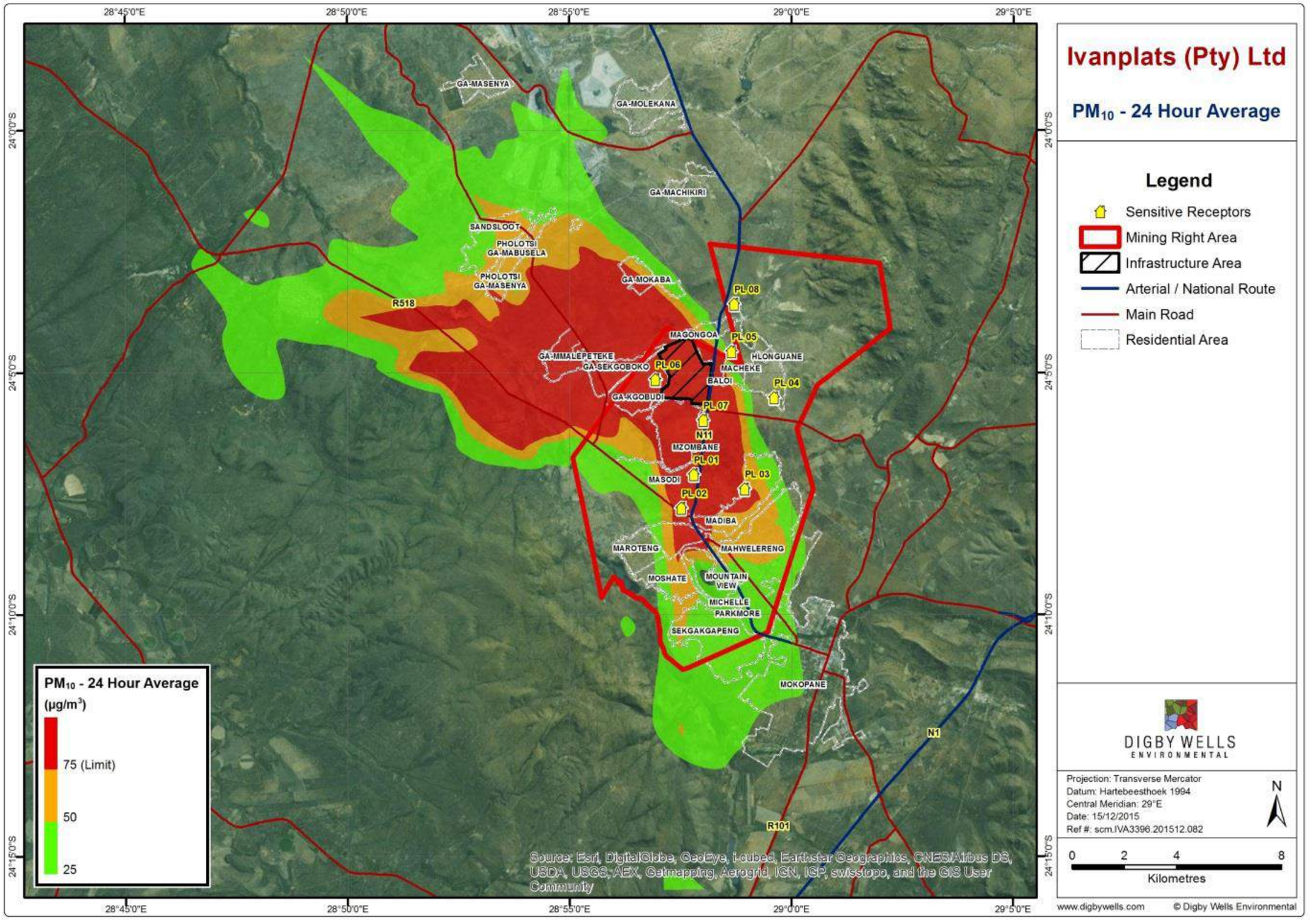


Figure 4-1: Predicted 24-hr average PM_{10} concentrations, 99th percentile (µg/m^3)

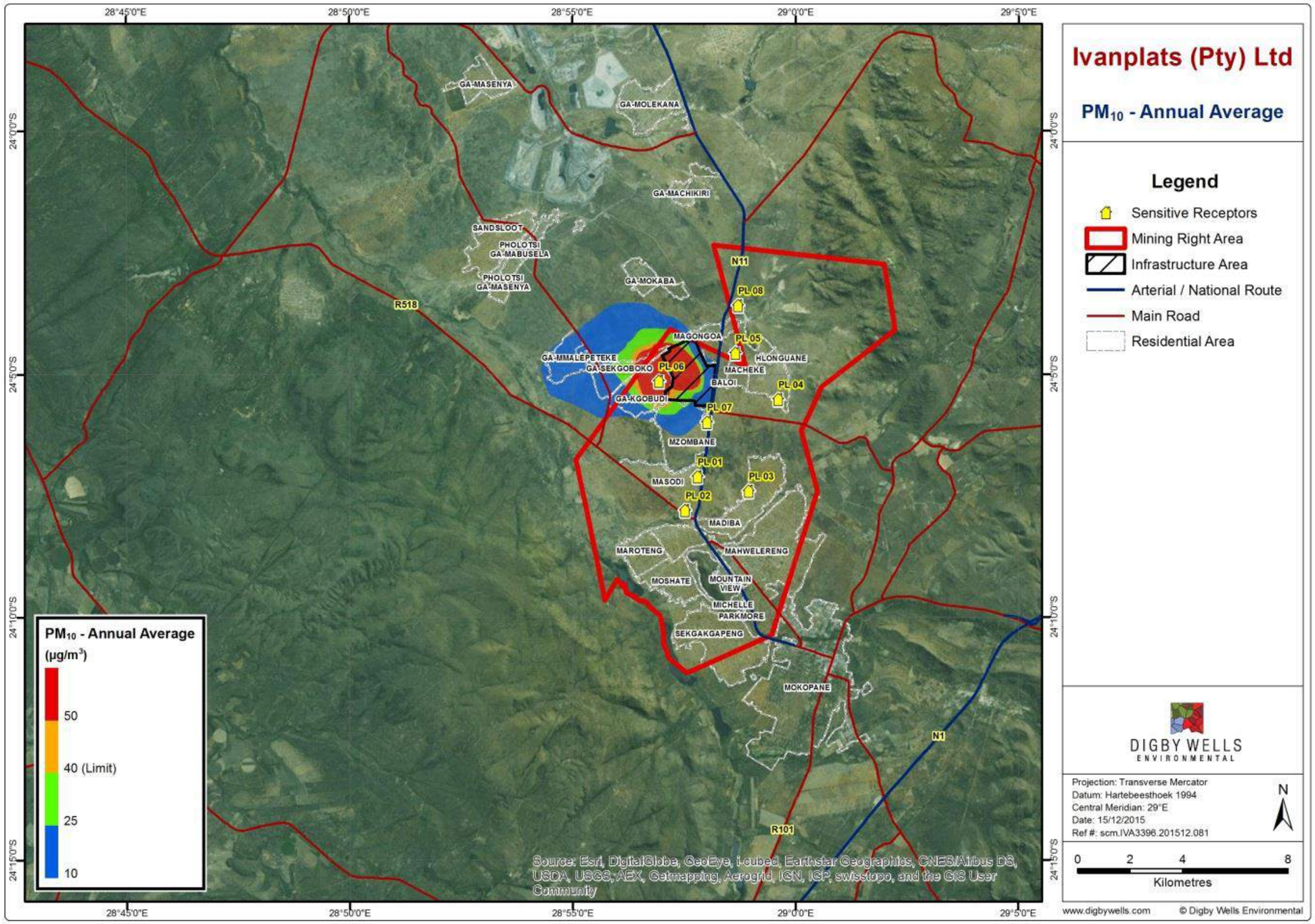


Figure 4-2: Predicted annual average PM_{10} concentrations without mitigation (µg/m^3)

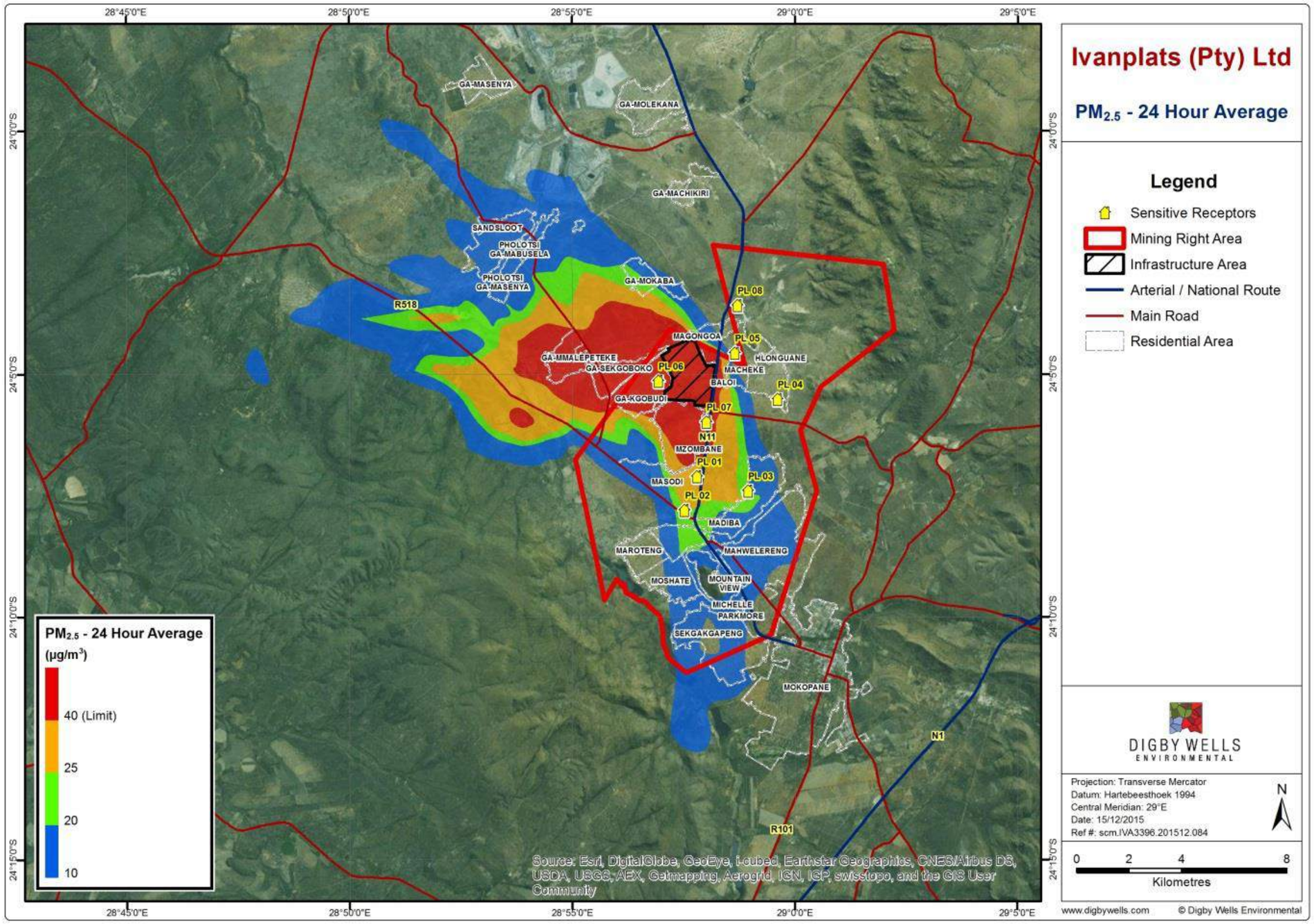


Figure 4-3: Predicted 24-hr average $PM_{2.5}$ concentrations, 99th percentile, without mitigation (µg/m^3)

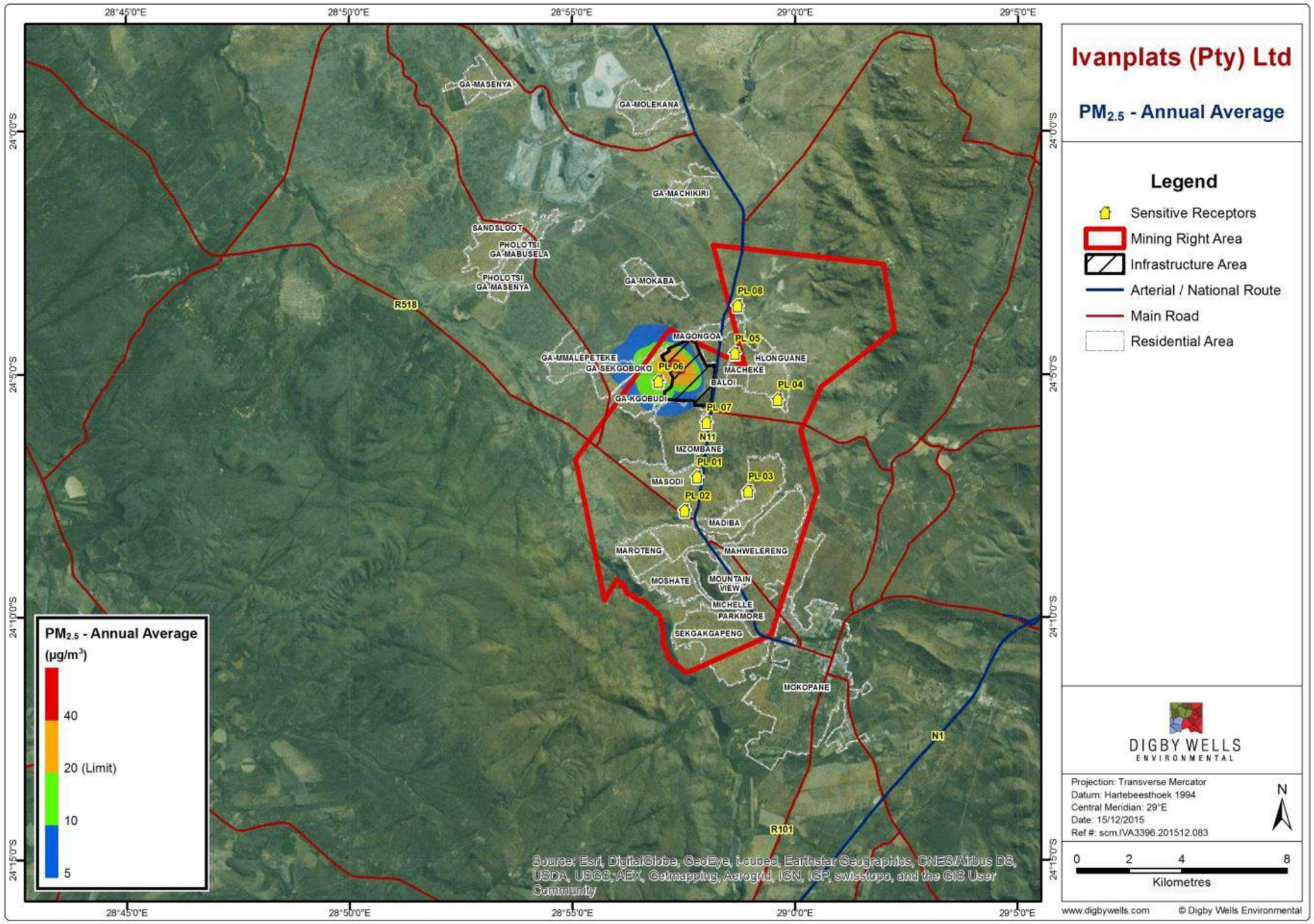


Figure 4-4: Predicted annual average $PM_{2.5}$ concentrations (µg/m^3), without mitigation

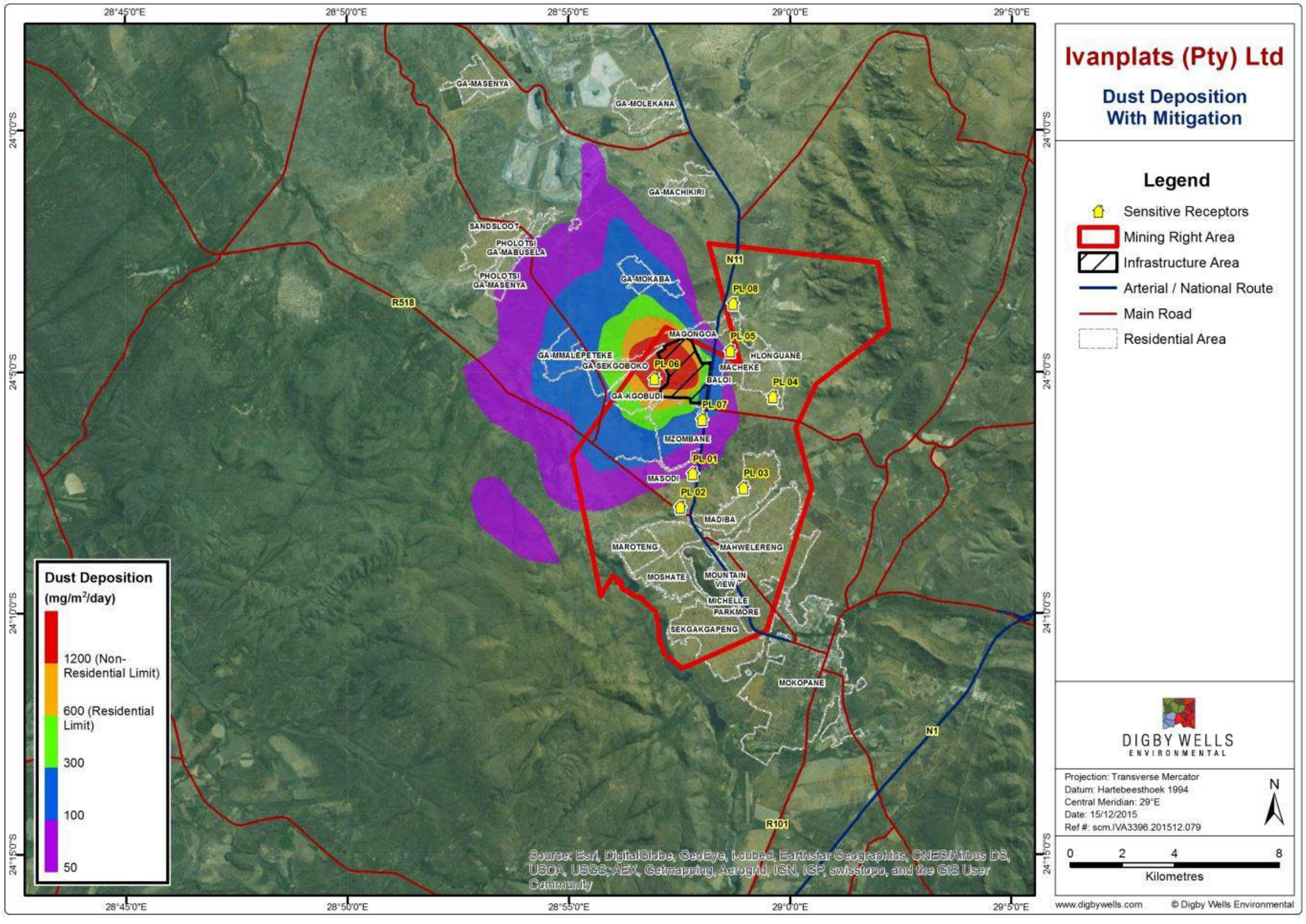


Figure 4-5: Predicted maximum (100th percentile) dust deposition (mg/m^2/day) without mitigation

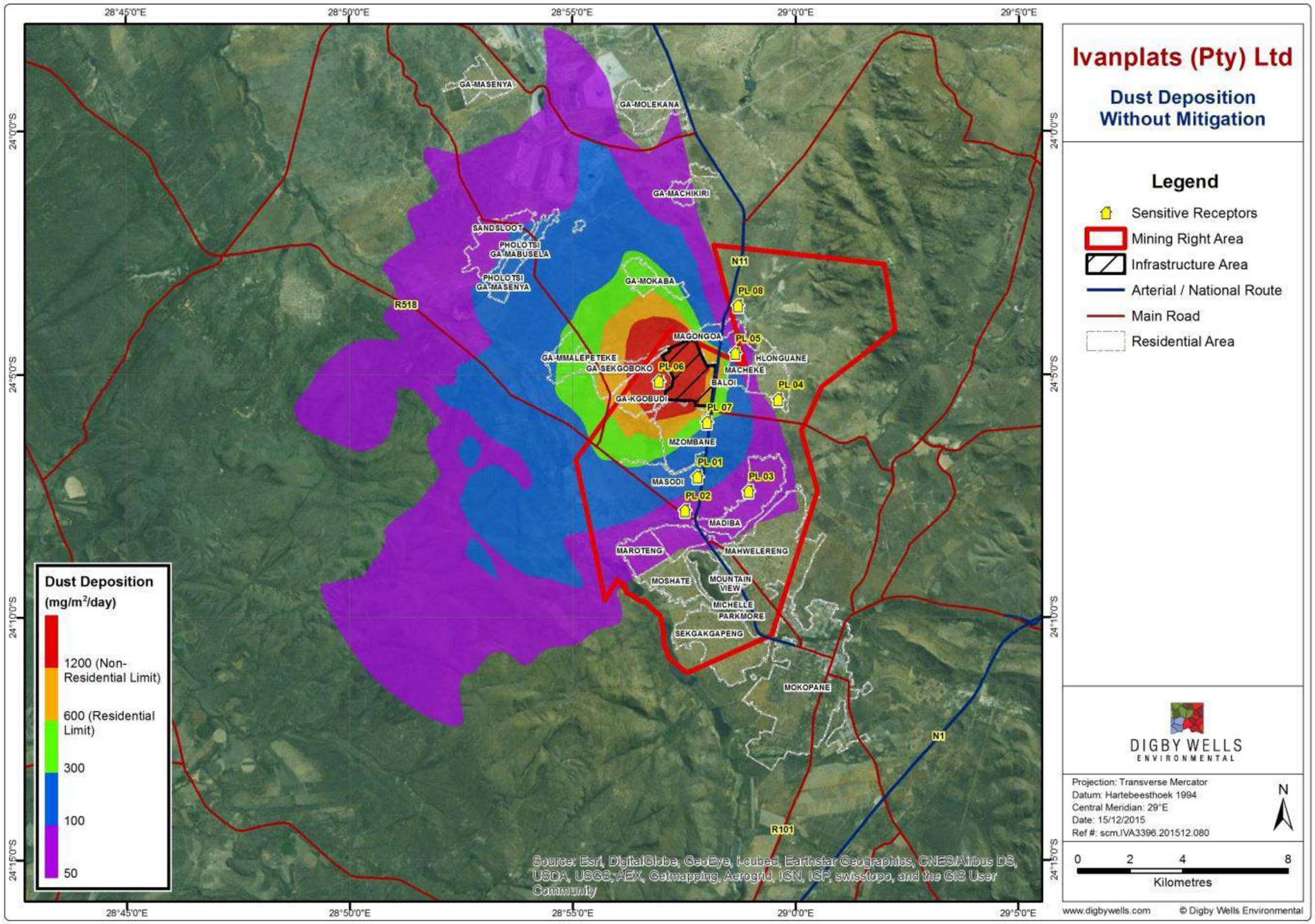


Figure 4-6: Predicted maximum (100th percentile) dust deposition (mg/m2/day) with mitigation

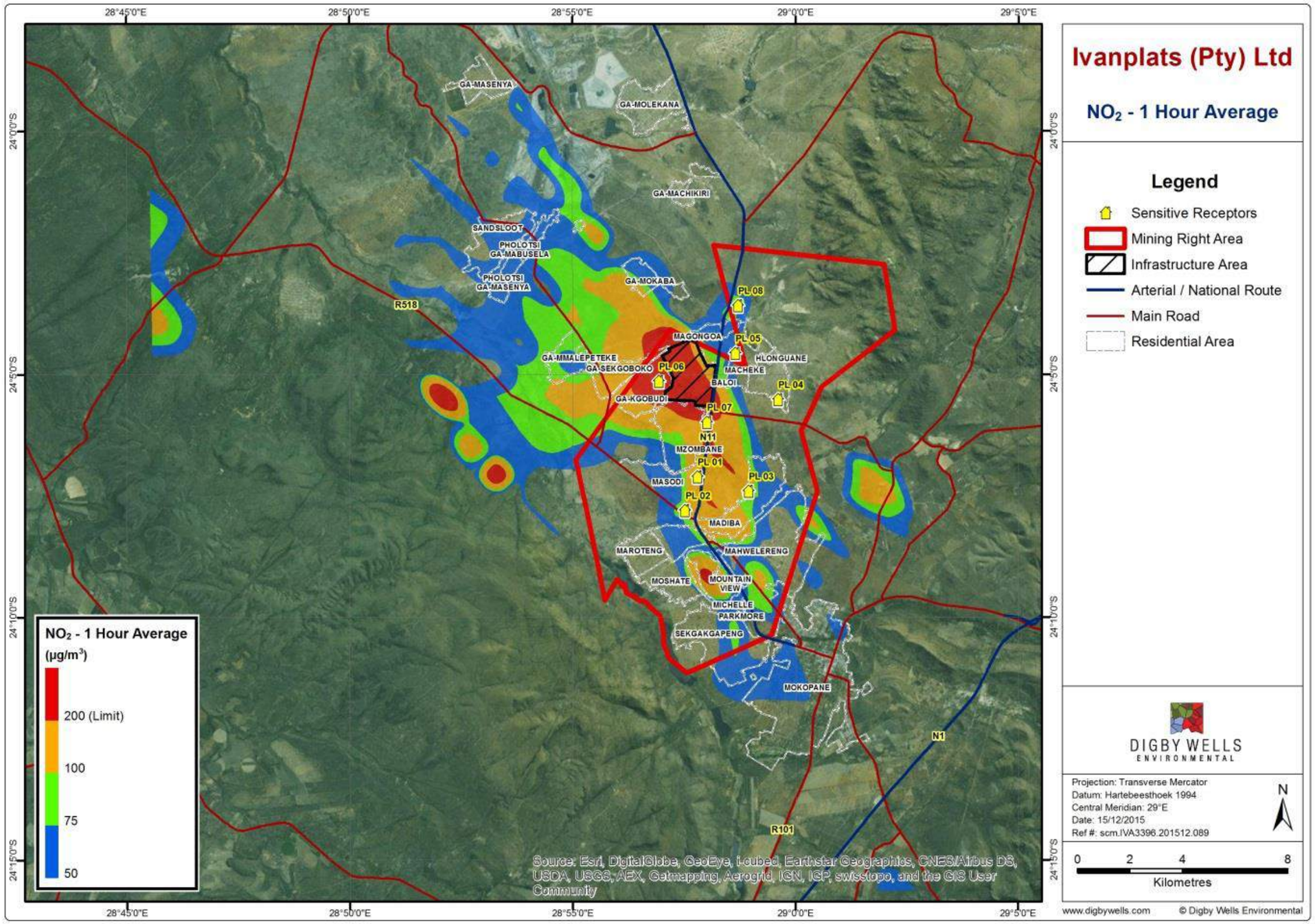


Figure 4-7: Predicted NO_2 Maximum 1-Hour Average Concentrations (µg/m^3)

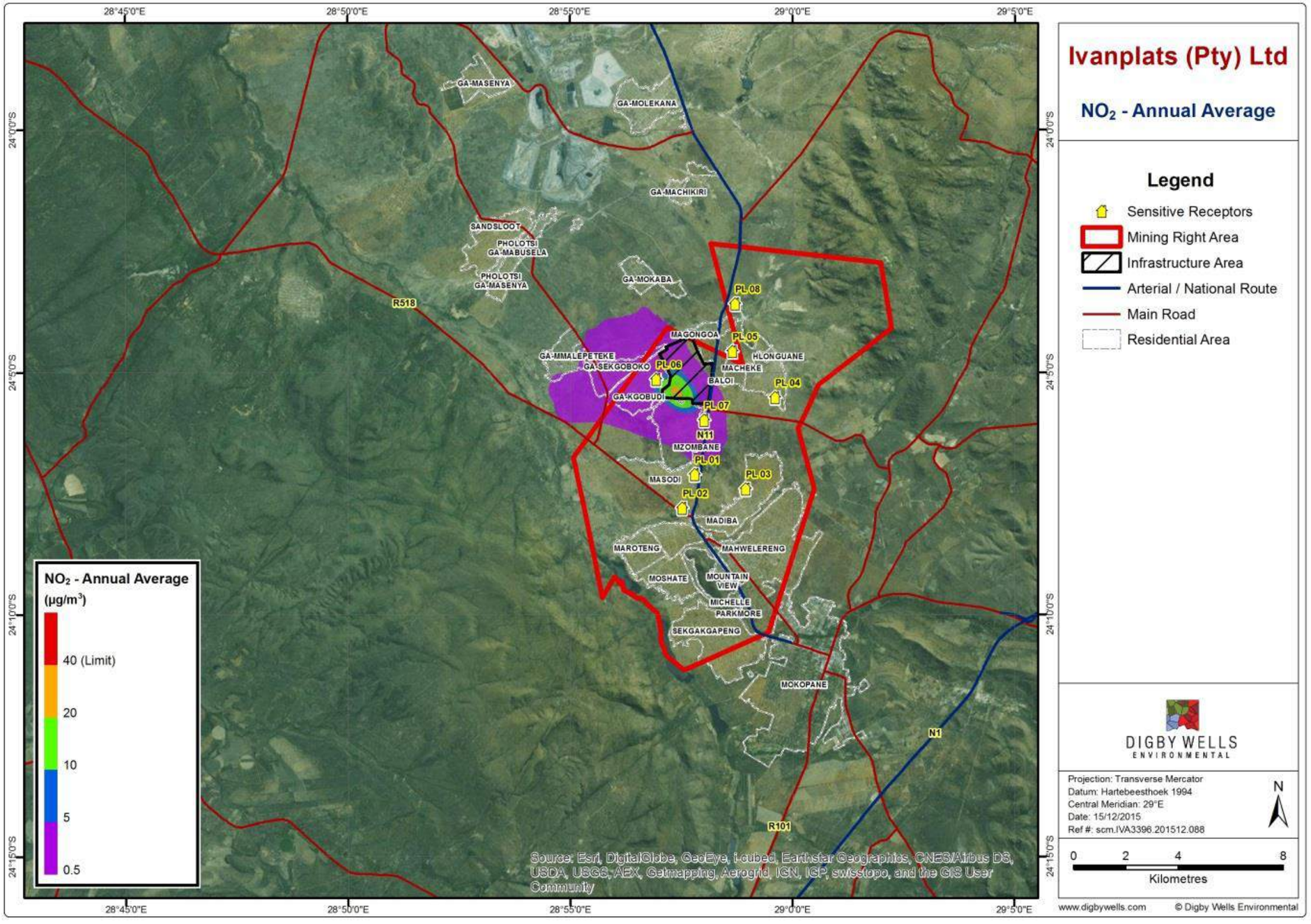


Figure 4-8: Predicted NO_2 Annual Concentration (µg/m^3)

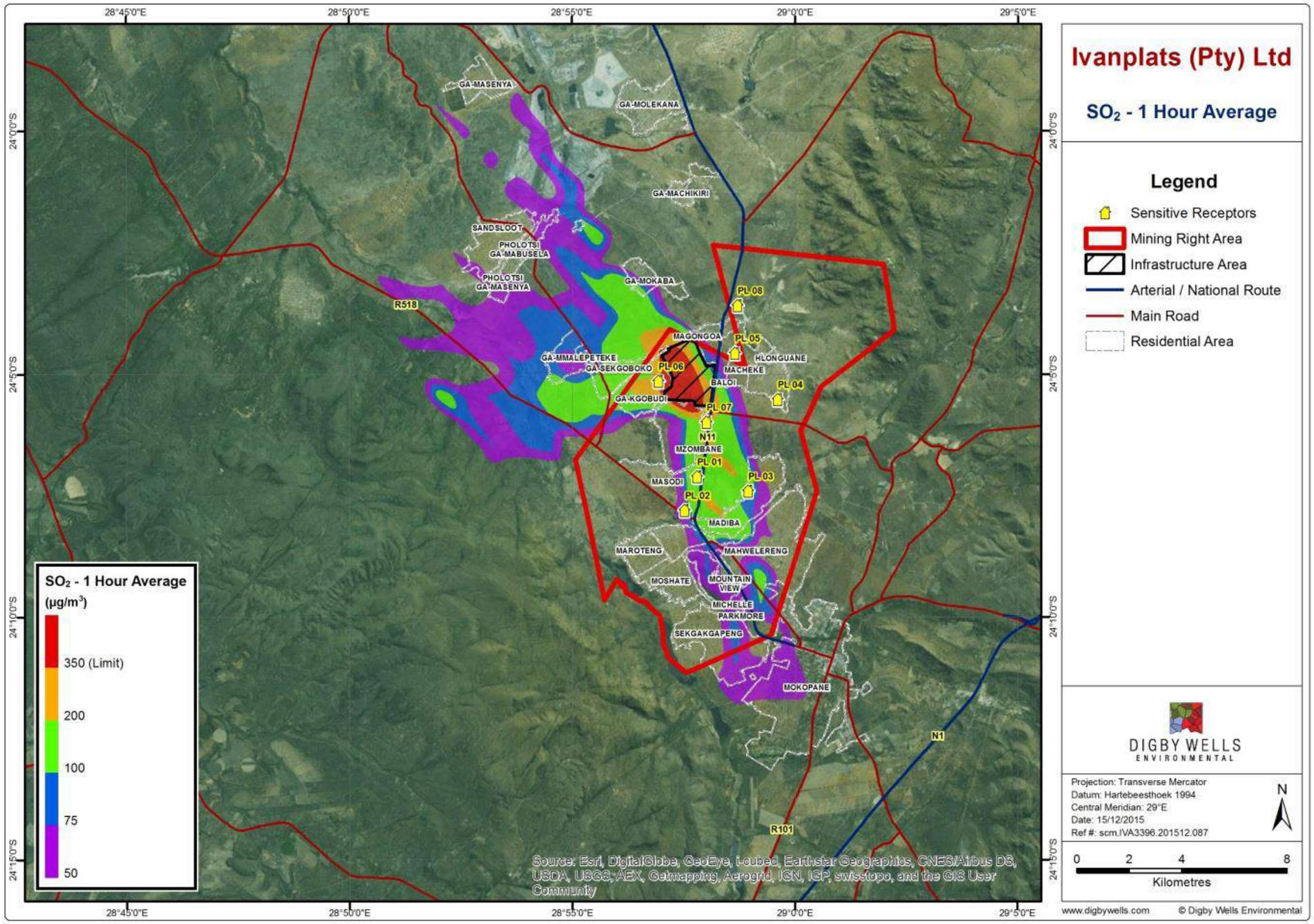


Figure 4-9: Predicted SO_2 Maximum 1-Hour Average Concentrations (µg/m^3)

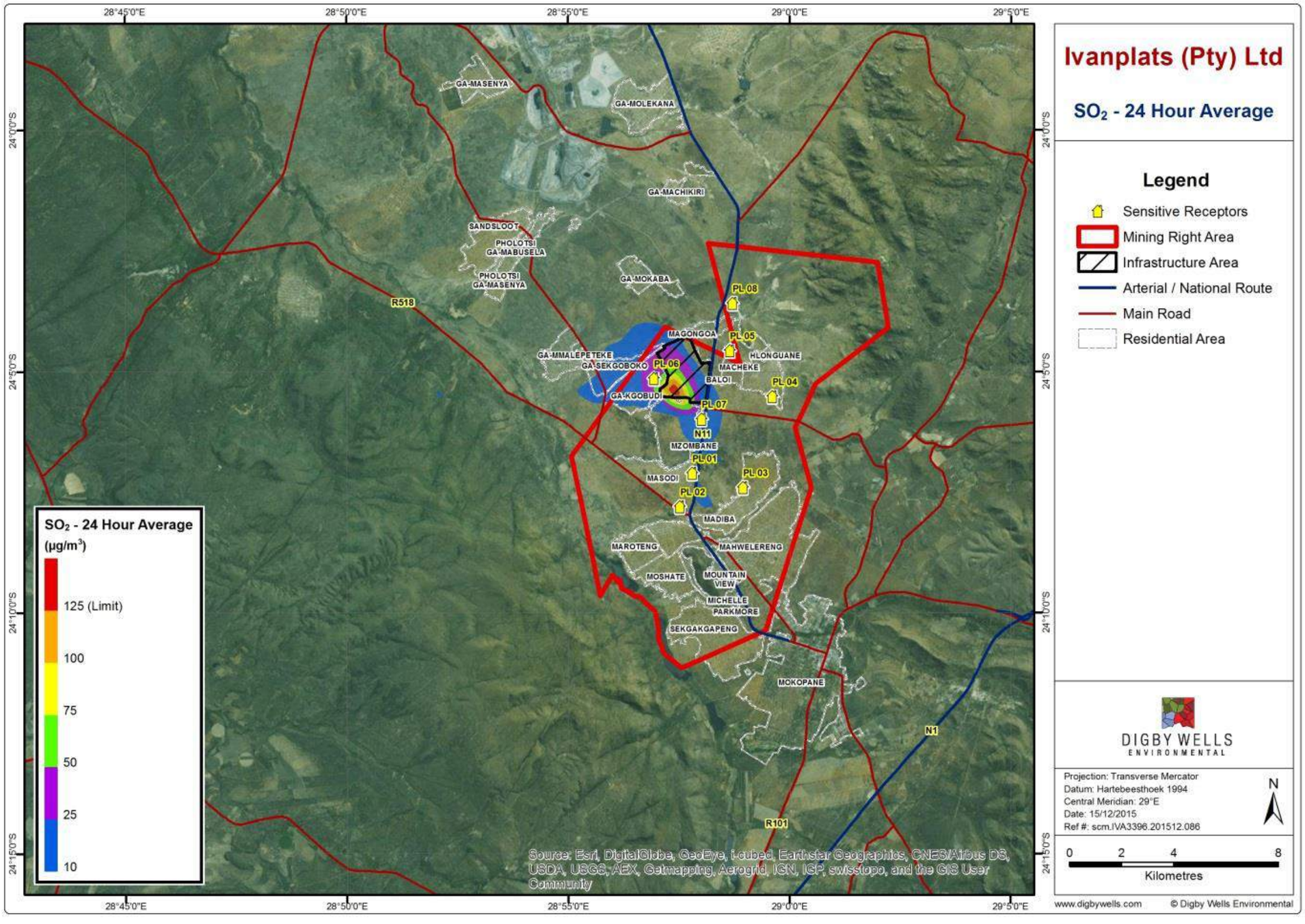


Figure 4-10: Predicted SO_2 Maximum 24-Hour Average Concentration (µg/m^3)

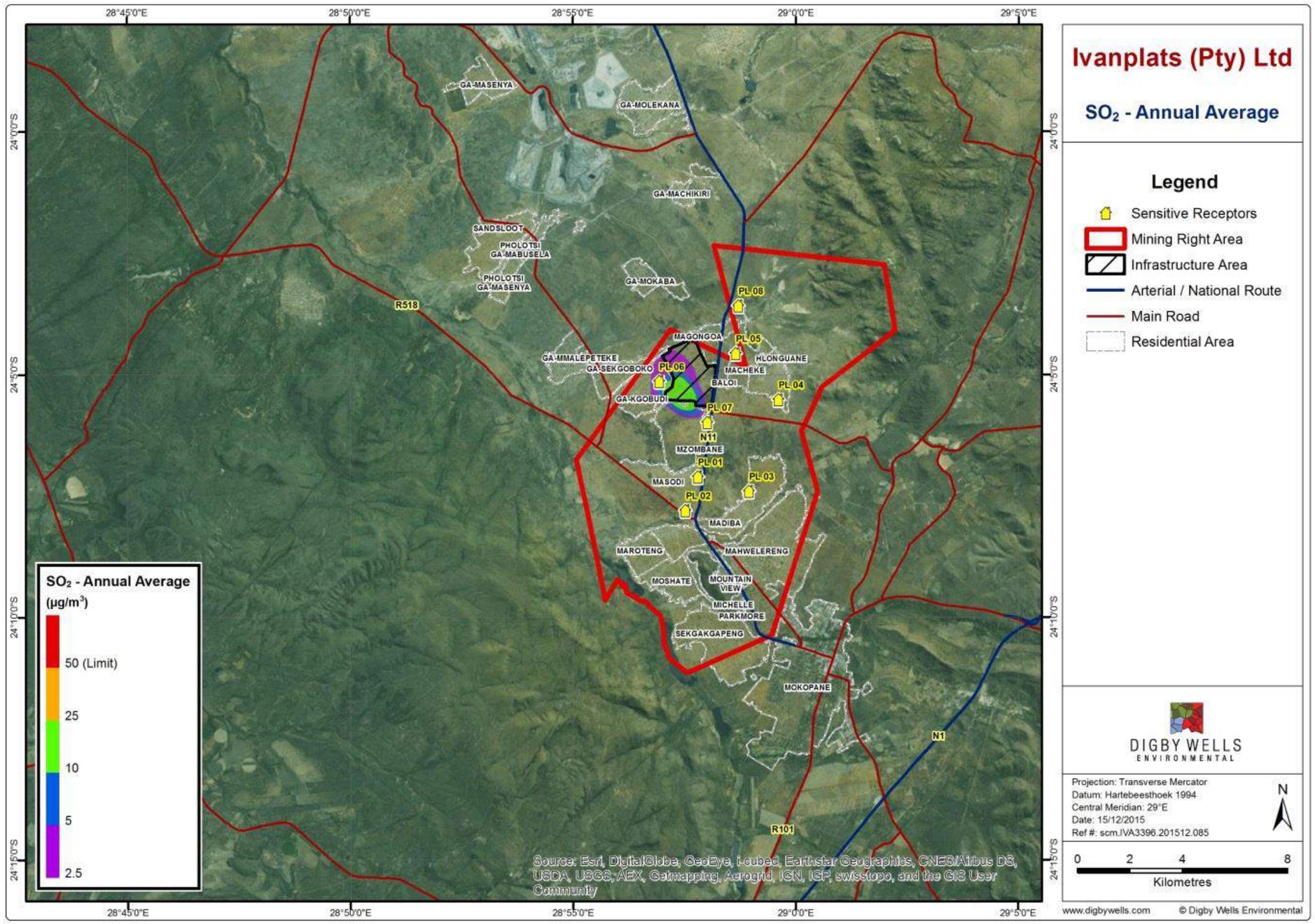


Figure 4-11: Predicted SO_2 Annual Concentration (µg/m^3)

4.2 Discussion

The impacts arising from the amendment associated with the proposed mine have been appraised using model prediction of ground level concentrations and the spread of pollutants across the landscape.

Of all the areas and phases considered in the AQIA study, the operational phase is typified as the worst case scenario, since multiple activities are conducted at the same time i.e. waste rock dump, ROM, product stockpile, dirt roads and generators amongst other sources of air pollution. Hence, if conditions are curtailed within the project area during this phase, associated impacts on-site and off the mine boundary are expected to be minimal. The main findings of this AQIA study can be summarised as follows:

- Daily PM_{10} – Predicted levels are high in the Project area and surroundings respectively. Predicted maximum daily concentrations are found to exceed the current daily standard of 75 µg/m^3 without mitigation measures in place.
- Annual PM_{10} – Predicted annual concentrations at 100th percentile are exceeded outside the mine boundary. Concentrations at the sensitive receptors are within limit except at PLA6 (Ga-Kgobudi) (603 µg/m^3).
- Daily $PM_{2.5}$ – Measured levels in the project area are higher than the current South African standards (40 µg/m^3). However, with appropriate mitigation applied, ambient concentrations of this pollutant will be reduced. The annual concentrations at the sensitive receptors are within limit.
- Annual $PM_{2.5}$ – Predicted annual concentrations did not exceed the current South African limit (20 µg/m^3). Only site PLA6 (125 µgm^3) was in exceedance of the standard.
- Dust deposition rates predicted for the proposed mine are high. However, model predictions show that only site PLA6 will be in exceedance.

For the gaseous pollutants from the generators as a source of air pollution:

- Hourly NO_2 - The predicted NO_2 concentrations simulated at the proposed mining area are high. The hourly concentration exceeded the current limit for some 1.4 km from the western boundary and 628 m from the project boundary.
- Annual NO_2 – Predicted annual concentrations did not exceed the existing South African standard (40 µg/m^3), within the project area and beyond.
- 1-hour SO_2 - The 1-hour SO_2 concentrations predicted at the proposed mining area are below the recommended South African standard of 350 µg/m^3.
- 24-hours SO_2 - The 24-hours SO_2 concentrations are within the South African standard of 125 µg/m^3. Concentrations at sensitive receptors were within the recommended limit.

- Hourly CO – Predicted maximum hourly concentrations are within the regulatory limit value. No exceedance of the South African standard of 30,000 µg/m^3 was predicted.

All the simulations were done for the worst case scenario, assuming that the stockpiles, haul roads, crushers had no mitigation measures in place. It was assumed that the sources are operational for 24-hours a day, all seven days a week, 350 days per year. If the recommended mitigation measures are implemented correctly, a reduction in emissions will occur.

5 Impact Assessment

5.1 Methodology

The impacts are assessed based on the impact's magnitude as well as the receiver's sensitivity, culminating in an impact significance which identifies the most important impacts that require management.

Based on international guidelines and South African legislation, the following criteria are taken into account when examining potentially significant impacts:

- Nature of impacts (direct/indirect, positive/ negative);
- Duration (short/medium/long-term, permanent(irreversible) / temporary (reversible), frequent/seldom);
- Extent (geographical area, size of affected population/habitat/species);
- Intensity (minimal, severe, replaceable/irreplaceable);
- Probability (high/medium/low probability); and
- Possibility to mitigate, avoid or offset significant adverse impacts.

Details of the impact assessment methodology used to determine the significance of physical, bio-physical and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

Significance = Consequence x Probability x Nature

Where

Consequence = Intensity + Extent + Duration

And

Probability = Likelihood of an impact occurring

And

Nature = Positive (+1) or negative (-1) impact

Note: In the formula for calculating consequence, the type of impact is multiplied by +1 for positive impacts and -1 for negative impacts

The matrix calculates the rating out of 147, whereby Intensity, Extent, Duration and Probability are each rated out of seven as indicated in Table 5-3. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation measure proposed in this EIA/EMP Report. The significance of an impact is then determined and categorised into one of eight categories, as indicated in Table 5-2, which is extracted from Table 5-1. The description of the significance ratings is discussed in Table 5-3.

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, i.e. there may already be certain types of mitigation measures included in the design (for example due to legal requirements). If the potential impact is still considered too high, additional mitigation measures are proposed.

Table 5-1: Impact Assessment Parameter Ratings

Rating	Intensity/Replacability		Extent	Duration/Reversibility	Probability
	Negative impacts	Positive impacts			
7	Irreplaceable damage to highly valued items of great natural or social significance or complete breakdown of natural and / or social order.	Noticeable, on-going natural and / or social benefits which have improved the overall conditions of the baseline.	International The effect will occur across international borders.	Permanent: The impact is irreversible, even with management, and will remain after the life of the project.	Definite: There are sound scientific reasons to expect that the impact will definitely occur. >80% probability.
6	Irreplaceable damage to highly valued items of natural or social significance or breakdown of natural and / or social order.	Great improvement to the overall conditions of a large percentage of the baseline.	National Will affect the entire country.	Beyond project life: The impact will remain for some time after the life of the project and is potentially irreversible even with management.	Almost certain / Highly probable: It is most likely that the impact will occur. <80% probability.
5	Very serious widespread natural and / or social baseline changes. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	Province/ Region Will affect the entire province or region.	Project Life (>15 years): The impact will cease after the operational life span of the project and can be reversed with sufficient management.	Likely: The impact may occur. <65% probability.
4	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	Average to intense natural and / or social benefits to some elements of the baseline.	Municipal Area Will affect the whole municipal area.	Long term: 6-15 years and impact can be reversed with management.	Probable: Has occurred here or elsewhere and could therefore occur. <50% probability.

Rating	Intensity/Replacability		Extent	Duration/Reversibility	Probability
	Negative impacts	**Positive impacts**			
3	On-going natural and / or social issues. Discernible changes to natural or social baseline.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	Local Local extending only as far as the development site area.	Medium term: 1-5 years and impact can be reversed with minimal management.	Unlikely: Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur. <25% probability.
2	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	Low positive impacts experience by a small percentage of the baseline.	Limited Limited to the site and its immediate surroundings.	Short term: Less than 1 year and is reversible.	Rare / improbable: Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures. <10% probability.
1	Minimal natural and / or social impacts, low-level replaceable damage with no change to the baseline.	Some low-level natural and / or social benefits felt by a very small percentage of the baseline.	Very limited Limited to specific isolated parts of the site.	Immediate: Less than 1 month and is completely reversible without management.	Highly unlikely / None: Expected never to happen. <1% probability.

Table 5-2: Probability/Consequence Matrix

		Significance																																				
Probability	7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
	6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
	5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
	4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
	3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
	2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
	1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		Consequence																																						

Table 5-3: Significance Rating Description

Score	Description	Rating
109 to 147	A very beneficial impact that may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the (natural and / or social) environment	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the natural and / or social environment	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the natural and / or social environment	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural and / or social environment	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the natural and / or social environment	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the (natural and / or social) environment and result in severe effects	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts are likely to be irreversible and/or irreplaceable.	Major (negative)

5.2 Impact Assessment

5.2.1 Construction Phase

5.2.1.1 Project activities assessed

As part of the Construction Phase, the following activities are identified that may impact on the air quality of the area i.e. increasing particulate matter concentration in the ambient atmosphere:

- Mine Development of Headgear, Sinking Shafts and Vent Raises;
- Access/ haul roads and storm water drains; and
- Generation of power using diesel generators (<10 MW).

Table 5-4: Interactions and Impacts of Developing Headgear, Sinking Shafts and Vent Raises

Interaction	Impact
Site clearing	Reduction in air quality
Dust emission	Reduction in air quality

5.2.1.2 Impact Description

Removal of vegetation using a range of construction equipment prior to the development of the headgear, shaft and vent raises will lead to the generation of fugitive dust comprising TSP, PM_{10} and $PM_{2.5}$. The sinking of the production shaft (i.e. Shaft 2) will result in blasting and generation of fugitive dust. The area impacted is considered minimal and impacts on the atmospheric environment will cease once the construction phase ends.

5.2.1.3 Management Objectives

The management objective is to ensure that emissions on-site and off-site from clearing and sinking of Shaft 2 are not in exceedance of the applicable regulatory standards for the protection of the environment, human health and wellbeing.

5.2.1.4 Management Actions and Targets

Adopt emissions management programme to assess performance and compliance to standards. Monitoring dust levels on site, at upwind and downwind locations if possible at discrete receptors to assess public exposure.

5.2.1.5 Construction Phase Impact Ratings

Table 5-5: Development of Headgear, Sinking of Shaft and Vent Raise

Activity and Interaction (Development of Headgear, Sinking Shaft and Vent raise requires site clearing)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Dust generation from site clearing of infrastructure footprint, dust generation from sinking shaft due to blasting			
Prior to mitigation/ management			
Duration	Medium term (3)	Impact can be reversed with minimal management after construction ceases.	Negligible (negative) – 35
Extent	Limited (2)	Limited to the site and its immediate surroundings.	
Intensity x type of impact	Minor - negative (-2)	Minor. Very little change to the baseline.	
Probability	Likely (5)	It is likely that dust generation will occur during construction.	
Mitigation/ Management actions			
▪ Application of wetting agents or dust suppressant on the dirt road and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing or digging must occur; and ▪ Drop heights when loading and offloading material should be minimised.			
Post- mitigation			
Duration	Medium term (3)	Impact can be reversed with minimal management after construction ceases.	Negligible (negative) – 21
Extent	Limited (2)	Compaction will only occur within and immediately around the Project site.	
Intensity x type of impact	Minor - negative (-2)	Minor. Very little change to the baseline.	
Probability	unlikely (3)	It is unlikely that dust emissions will have an effect on air quality	

Table 5-6: Interactions and Impacts of Constructing Access/haul Roads, Storm Water Drains/berms

Interaction	Impact
Site clearing	Dust generation
Wind erosion due to exposed surfaces	Reduction in air quality

5.2.1.6 Impact Description

Removal of vegetation and grading takes place using a range of construction equipment. This will lead to generation of fugitive emissions from vehicle wheels and material handling comprising TSP, PM_{10} and $PM_{2.5}$. There will be clearing prior to the construction of haul roads, storm water drain and berms. There will also be movement of contractor and permanent workforce, vehicle activity on access roads, and the levelling and compacting of surfaces during this activity.

5.2.1.7 Management Objectives

The management objective is to ensure that emissions on-site and of-site from the construction of access and haul roads, storm water drain and berms are not in exceedance of the applicable regulatory standards for the protection of the environment, human health and wellbeing.

5.2.1.8 Management Actions and Targets1

Adopt an emissions management programme to assess performance and compliance to standards. Monitoring dust levels on site, at upwind and downwind locations if possible at discrete receptors to assess public exposure.

Table 5-7: Construction of Access/ Haul Roads and Storm Water Drains/Berms

Activity and Interaction (Access / haul roads and storm water drains/berms requires site clearing)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality			
Prior to mitigation/ management			
Duration	Medium term (2)	Dust will be generated for duration of the construction phase	Minor (negative) – 42
Extent	Local (3)	Airborne dust may extend across the development site area.	

Activity and Interaction (Access / haul roads and storm water drains/berms requires site clearing)			
Dimension	**Rating**	**Motivation**	**Significance**
Intensity x type of impact	Minor (-2)	Minor effect surrounding area is anticipated	
Probability	Almost certain (6)	There is a possibility that generated dust will impact ambient air quality.	
Mitigation/ Management actions[2]			
▪ Application of dust suppressant on the dirt road and exposed areas; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging must occur; and ▪ The drop heights when loading onto trucks and at tipping points should be minimised.			
Post- mitigation			
Duration	Short term (2)	Dust generation will occur for the duration of this phase	Negligible (negative) – 12
Extent	Very Limited (1)	After mitigation measures are implemented, It is expected that dust impacts will be limited to isolated parts of the site.	
Intensity x type of impact	Minimal (-1)	Dust emissions will be minimal after mitigation	
Probability	Unlikely (3)	Unlikely that impact on ambient air quality if mitigation measures are applied.	

Table 5-8: Interactions and Impacts of Generation of Power using Diesel Generators (10 MW)

Interaction	Impact
Emissions of gaseous pollutants	Reduction in air quality

5.2.1.9 Impact Description

The generation of power from diesel generators will result in the release of gaseous pollutants to the ambient environment, such as: NOx, SO_2, CO, and particulate matter. The area impacted can be extensive reaching municipal level due to the ease of transport. The dispersion modelling shows that emissions from the use of generator sets will reduce the

quality of air with ground level concentrations outside the mine boundary exceeding regulatory standards for NO_2 and SO_2 respectively.

5.2.1.10 Management Objectives

The management objective is to ensure that emissions on-site and of-site from this activity are within the applicable regulatory standards for the protection of the environment, human health and wellbeing.

5.2.1.11 Management Actions and Targets

Adopt a management programme to ensure that emissions are within compliance to standards i.e. Ground level concentrations at upwind and downwind locations must not exceed standards.

Table 5-9: Generation of Power using Diesel Generators (10 MW)

Activity and Interaction (Generation of power leads to gaseous emissions: NOx, SO_2, CO and particulate matter)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality due to gaseous emissions			
Prior to mitigation/ management			
Duration	Medium term (3)	Emissions of gases during construction	Moderate (negative) – 77
Extent	Local(3)	Impact can be felt at a local level.	
Intensity x type of impact	Very serious - negative (-5)	Significant release of NOx, SO_2, CO, and particulate matter resulting in changes to ambient atmosphere	
Probability	Definite (7)	It is likely that gases will be released resulting in air pollution	
Mitigation/ Management actions[3]			
▪ Ensure generators are working at optimal conditions; ▪ Fitting of gas scrubbers; ▪ Use of low sulfur diesel; and ▪ Fitting electrostatic precipitators.			
Post- mitigation			
Duration	Medium term (3)	Emissions of gases during construction	Negligible (negative) – 24
Extent	Limited (2)	Impacts will be limited to the Project site.	
Intensity x	Moderate -	The concentrations of pollutants emitted	

Activity and Interaction (Generation of power leads to gaseous emissions: NOx, SO_2, CO and particulate matter)			
Dimension	**Rating**	**Motivation**	**Significance**
type of impact	negative (-3)	will decrease after mitigation	
Probability	Unlikely (3)	It is unlikely that emissions will have an effect after mitigation measures are applied	

5.2.2 Operational Phase

5.2.2.1 Project Activities Assessed

As part of the Operational Phase of the Project, the following activities are identified that may impact on the ambient air quality of the area i.e. increasing the concentration of pollutants in the atmosphere:

- Crushing: Waste Rock Crusher/Mine Crushers;
- Hauling: Internal mine roads, haul roads and access roads;
- Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore;
- Mining Processes: Production Shafts and Vent Raises; and
- Generation of power using diesel generators (<10 MW).

Table 5-10: Interactions and Impacts of Crushing

Interaction	Impact
Dust generation	Reduction in air quality

5.2.2.2 Impact Description

The waste rock crusher, the ore crusher and screening process release fugitive dust. The dust generated encompasses dust fall-out, PM_{10} and $PM_{2.5.}$ The PM_{10} and $PM_{2.5}$ fractions are capable of likely health implications due to the depth of penetration in the human respiratory system.

5.2.2.3 Management Objectives

The management objective is to ensure that emissions on-site and of-site from the crushing and screening process are not in exceedance of the applicable standards for the protection of the environment, human health and wellbeing.

5.2.2.4 Management Actions and Targets

Implementation of emissions management programme to assess performance and compliance to regulatory standards. Monitoring dust levels on site, at upwind and downwind locations preferably at discrete receptors to assess public exposure.

Table 5-11: Crushing Impacts

Activity and Interaction (Crushing of ore and waste rock results fugitive dust emissions)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Airborne dust leads to reduced air quality			
Prior to mitigation/ management			
Duration	Project life (5)	Crushing will occur for the Project life	Moderate (negative) – 84
Extent	Municipal (4)	Airborne dust may extend across the development site area.	
Intensity x type of impact	Very serious, long-term environmental impairment - negative (-5)	Emitted concentrations above regulatory guideline	
Probability	Almost certain (6)	Almost certain that impact will occur.	
Mitigation/ Management actions[4]			
▪ Application of wetting agents (wet suppression); and ▪ Enclosure for crushers.			
Post- mitigation			
Duration	Project life (5)	Crushing will occur for the Project life	Negligible (negative) – 27
Extent	Limited (2)	Dust emissions will be limited to the site and its immediate surroundings.	
Intensity x type of impact	Minor - negative (-2)	Environmental damage can be reversed internally.	
Probability	unlikely (3)	It is unlikely that dust emissions will have an effect after mitigation measures are applied.	

Table 5-12: Interactions and Impacts of Hauling, Internal Mine Roads, Haul Roads and Access Roads

Interaction	Impact
Dust emissions	Reduce air quality

5.2.2.5 Impact description

The hauling of ore and waste rock using internal haul routes will result in the generation of fugitive dust comprising TSP, PM_{10} and $PM_{2.5}$. The impacts will occur throughout the project life with long term implications on ambient air quality.

5.2.2.6 Management Objectives

The management objective is to ensure that emissions on-site and of-site from the use of internal access road and haul roads are not in exceedance of the applicable regulatory standards for the protection of the environment, human health and wellbeing.

5.2.2.7 Management Actions and Targets

Implement a management programme to assess performance and compliance to standards. Monitoring dust levels on site, at upwind and downwind locations if possible at discrete receptors to assess public exposure.

Table 5-13: Hauling: Internal Mine Roads, Haul Roads and Access Roads

Activity and Interaction (Hauling of ore and waste results in reduced air quality			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality			
Prior to mitigation/ management			
Duration	Project life (5)	Impact will cease after the operational life span of the Project	Moderate (negative) – 105
Extent	Regional (5)	Dust impact will affect the entire region	
Intensity x type of impact	Very serious – negative (-5)	Very serious long-term environmental impacts as the standards are exceeded	
Probability	Definite (7)	It is likely that emissions will occur	
Mitigation/ Management actions			
▪ Application of wetting agents or dust suppressant on the dirt road and exposed areas; and ▪ Set maximum speed limits and have these limits enforced.			
Post- mitigation			
Duration	Project life (5)	Impact will cease after the operational life span of the Project	Negligible (negative) – 30

Activity and Interaction (Hauling of ore and waste results in reduced air quality			
Dimension	**Rating**	**Motivation**	**Significance**
Extent	Limited (2)	Dust emissions will only occur within and around the Project site.	
Intensity x type of impact	Moderate - negative (-3)	Moderate short term effect	
Probability	unlikely (3)	It is unlikely that dust emissions will have an effect after mitigation	

Table 5-14: Interactions and Impacts of Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore

Interaction	Impact
Dust generation	Reduction in air quality

5.2.2.8 Impact description

The stockpiling of waste rock berm, waste rock, high grade and low grade ore will result in emissions from tipping and emissions from dirt roads, resulting in the release of fugitive dust. The erosion of stockpiles, road emissions due to hauling, and tipping result in fugitive emissions: dust fall, PM_{10} and $PM_{2.5.}$ The PM_{10} and $PM_{2.5}$ fractions are can induce health problems due to the depth of penetration in the human respiratory system.

5.2.2.9 Management Objectives

The management objective is to ensure that emissions on-site and off-site from the hauling and stockpiling of waste and ore are not in exceedance of the applicable standards for the protection of the environment, human health and wellbeing.

5.2.2.10 Management Actions and Targets

Implementation of emissions management programme to assess performance and compliance to regulatory standards. Monitoring dust deposition rates and PM_{10} levels on site, at upwind and downwind locations preferably at discrete receptors to assess public exposure.

Table 5-15: Construction Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore

Activity and Interaction (Stockpiling will result in dust emissions and reduced air quality)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality			
Prior to mitigation/ management			
Duration	Project life (5)	Dust erosion will occur throughout the project life	Minor (negative) – 78
Extent	Local (3)	Dust emissions will affect the site and nearby settlements.	
Intensity x type of impact	Very serious long-term negative (-5)	Long term impacts on the environment, as emissions outside the mine boundary are higher than the limit.	
Probability	Highly probable (6)	It is most likely that impact will occur.	
Mitigation/ Management actions			
▪ Application of wetting agents or dust suppressant on the dirt road used for hauling; ▪ Minimise drop heights when loading and offloading material ▪ Set maximum speed limits and have these limits enforced; and ▪ Vegetation of side walls.			
Post- mitigation			
Duration	Project life (5)	Dust erosion will occur throughout the project life	Negligible (negative) – 30
Extent	Limited (2)	Limited to the Project site.	
Intensity x type of impact	Moderate - negative (-3)	Moderate impact on air quality	
Probability	unlikely (3)	It is unlikely that fugitive emissions will worsen after mitigation measures are applied.	

Table 5-16: Interactions and Impacts of Mining Process: Shafts and Vent Raise

Interaction	**Impact**
Dust generation	Reduction in air quality

5.2.2.11 Impact description

The mining process will involve the hoisting of materials from underground to surface via the production shaft. The impact of the shaft on ambient air quality is limited. The vent raise serves a number or purposes, including allowing air into underground operations and venting of polluted air.

5.2.2.12 Management Objectives

The management objective is to ensure that emissions on-site and off-site from mining processes are not in exceedance of the applicable standards for the protection of the environment, human health and wellbeing.

5.2.2.13 Management Actions and Targets5

Implementation of an emissions management programme to assess performance of monitoring equipment and ensure compliance to regulatory standards. Monitoring dust deposition rates and PM_{10} levels on site, at upwind and downwind locations preferably at discrete receptors to assess public exposure.

Table 5-17: Mining Process: Production shafts and vent raises

Activity and Interaction (Mining processes production shat and vent raise			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality			
Prior to mitigation/ management			
Duration	Project life (5)	Impact will be for the project life	Minor (negative) – 21
Extent	Limited (2)	Airborne dust limited to project site.	
Intensity x type of impact	Minor - negative (-2)	Minor. Very little change to the baseline.	
Probability	Likely (5)	Impacts may occur.	
Mitigation/ Management actions			
▪ Ensure the concentrations of pollutants underground are within occupational exposure limit.			
Post- mitigation			
Duration	Project life (5)	Dust will be generated duration of the operational phase	Negligible (negative) – 27

Activity and Interaction (Mining processes production shat and vent raise			
Dimension	**Rating**	**Motivation**	**Significance**
Extent	Limited (2)	After mitigation measures are implemented, It is expected that dust impacts will be limited to the project site.	
Intensity x type of impact	Minor - negative (-2)	Generated dust will have minor effect	
Probability	unlikely (3)	It is unlikely that dust emissions will have an effect on ambient air quality.	

Table 5-18: Interactions and Impacts of Generation of Power using Diesel Generators (<10 MW)

Interaction	Impact
Emissions of gaseous pollutants	Reduction in air quality

5.2.2.14 Impact description

The generation of power from diesel generators will result in the release of gaseous pollutants to the ambient environment, such as: NOx, SO_2, CO, and particulate matter. The area impacted can be extensive reaching municipal level due to the ease of transporting gaseous pollutants. The dispersion model shows that emissions from the use of generator sets will reduce the quality of air with ground level concentrations outside the mine boundary exceeding regulatory standards for NOx and SO2 respectively.

5.2.2.15 Management Objectives

The management objective is to ensure that emissions on-site and of-site from this activity are within the applicable regulatory standards for the protection of the environment, human health and wellbeing.

5.2.2.16 Management Actions and Targets

Adopt management programme to ensure that emissions are within compliance to standards i.e. Ground level concentrations at upwind and downwind locations must be not exceed standards.

Table 5-19: Generation of power using diesel generators (10 MW)

Activity and Interaction (Generation of power leads to gaseous emissions: NOx, SO_2, CO and particulate matter)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality due to gaseous emissions			
Prior to mitigation/ management			
Duration	Project life (5)	Emissions of gases during operational phase will occur for the project life	Moderate (negative) – 91
Extent	Local (3)	Impact can be felt locally, extending outside the mine boundary.	
Intensity x type of impact	Very serious - negative (-5)	Significant changes of natural or environmental baseline	
Probability	Definite (7)	It is certain that emissions will occur	
Mitigation/ Management actions[6]			
▪ Ensure generators are working at optimum conditions; ▪ Fitting of gas scrubbers; ▪ Use of low sulfur diesel; and ▪ Fitting electrostatic precipitators.			
Post- mitigation			
Duration	Project life (5)	Emissions of gases during operational phase will occur for the project life	Negligible (negative) – 30
Extent	Limited (2)	Impacts will be limited to the Project site.	
Intensity x type of impact	Moderate - negative (-3)	The area impacted will be minimised after mitigation measures are applied.	
Probability	unlikely (3)	It is unlikely that emissions will have an effect after mitigation measures are applied	

[6] This shouldn't be long. it is a brief, bulleted description of the mitigation

5.2.3 Decommissioning Phase

5.2.3.1 Project activities assessed

As part of the Decommissioning Phase, the following activities are identified that may impact on the ambient air quality of the area i.e. increasing particulate matter concentration in the atmosphere:

- Decommissioning and removal of infrastructure; and
- Rehabilitation and sealing of shafts.

Table 5-20: Interactions and Impacts of Decommissioning and Removal of Infrastructure

Interaction	Impact
Dust generation	Reduction in air quality

5.2.3.2 Impact description

The dismantling of mine infrastructure and removal of rubble and materials leads to the generation of dust. The subsequent rehabilitation of the project area including sealing of shafts will involve the use of heavy machinery and vehicles similar to the construction phase. This will result in the release of fugitive dust containing TSP, PM_{10} and $PM_{2.5}$.

5.2.3.3 Management Objectives

The management objective is to ensure that emissions on-site and of-site from the dismantling process and subsequent rehabilitation of the project area are not in exceedance of the applicable standards.

5.2.3.4 Management Actions and Targets

Adoption of a realistic emissions management programme to assess performance and compliance to applicable standards. Monitoring dust levels on site, at upwind and downwind locations preferably at discrete receptors to assess human exposure.

Table 5-21: Significance Rating for Demolition of Infrastructure

Activity and Interaction (Demolition of Infrastructure results in dust emission)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduce air quality due to dust emission			
Prior to mitigation/ management			
Duration	Short term (2)	Impact on air quality is limited to the duration of the decommissioning phase	Negligible (negative) – 24
Extent	Limited (3)	Limited to the site and its immediate surroundings	
Intensity x type of impact	Minor (1)	Minor impact is expected	
Probability	Probable (4)	Unlikely that dust will impact on the nearby receptors.	
Mitigation/ Management actions[7]			
▪ The dismantling area disturbed must be kept to a minimum; ▪ Drop heights when offloading materials for rehabilitation must be minimised; and ▪ Limit demolition activities to non-windy days. ▪ Rehabilitation in accordance with rehabilitation plan ▪ Dust suppression on exposed surfaces.			
Post- mitigation			
Duration	Short term (2)	Dust impact will be limited to the duration of the decommissioning phase	Negligible (negative) – 18
Extent	Local (3)	Dust will be limited to project site after mitigation.	
Intensity x type of impact	Minimal (1)	Minimal dust impact	
Probability	Unlikely (3)	Improbable that dust will impact nearby receptors.	

Table 5-22: Significance rating for Rehabilitation and Sealing of Shafts

Activity and Interaction (Rehabilitation of project area and sealing of shaft will results in dust emission)			
Dimension	**Rating**	**Motivation**	**Significance**
Impact Description: Reduction in air quality			
Prior to mitigation/ management			
Duration	Medium term (3)	Impact on air quality will be medium term for the duration of the rehabilitation	Minor (negative) – 45
Extent	Local (3)	Limited to the site and its immediate surroundings	
Intensity x type of impact	Moderate short term (3)	Moderate impact is expected	
Probability	Likely (5)	Likely that dust will impact on the nearby receptors.	
Mitigation/ Management actions[8]			
▪ Drop heights should be minimised when offloading materials for rehabilitation; ▪ Limit rehabilitation activities to non-windy days; and ▪ Rehabilitation in accordance with rehabilitation plan; ▪ Dust suppression on exposed surfaces.			
Post- mitigation			
Duration	Medium term (3)	Impact on air quality will be medium term for the duration of the rehabilitation	Negligible (negative) – 18
Extent	Limited (2)	Airborne dust will be limited to the development site area.	
Intensity x type of impact	Minimal (1)	Minimal dust impact	
Probability	Unlikely (3)	Improbable that dust will impact nearby receptors.	

6 Unplanned Events and Low Risks

Information on the likelihood of occurrence of unplanned events was drawn from statistics in the industry and related organisations. Data on the type of incidents and frequency will assist in establishing the nature i.e. risk levels, geographic spread and appropriate mitigation measures to adopt in the event of one. Highlighted below are some likely unplanned events related to projects of this nature and the associated management measures to address them (Table 6-1).

[8] This shouldn't be long. it is a brief, bulleted description of the mitigation

Table 6-1: Unplanned Events, Low Risks and their Management Measures

Unplanned event	Potential impact	Mitigation/ Management/ Monitoring
Operational error at the processing plant	Poor air quality - release of pollutants i.e. SO_2, NO_2 over allowable limits	Strict adherence to "Standard Operating Procedure" Emergency preparedness and response in place
Leaks or failure in gas handling or emission control system at the plants i.e. malfunctioning scrubbers, electrostatic precipitators	Poor air quality - release of pollutants above allowable limits	Emergency preparedness and response in place Ambient air quality monitoring
Dust storm episode (erosion of the TSFs)	Poor air quality	Dust monitoring

7 Environmental Management Programme

The objective of an Environmental Management Plan (EMP) is to present mitigation to (a) avoidable adverse impacts associated with the development of a project and (b) to enhance potential positives.

7.1 Project Activities with Potentially Significant Impacts

This section lists the aspects that are expected to impact most on ambient air quality during the operation (Table 7-1), as confirmed by model predictions. Hence, these Project activities should be carried with mitigation measures in place if the mine is to comply with the relevant ambient air quality standards.

Table 7-1: Potentially Significant Impacts

Aspects	Potential Significant Impacts
Use of haul roads	*Dust generation*
	Reduction in air quality
Crushing	*Dust generation*
	Reduction in air quality
Emissions from Generators	*Release of gases*
	Reduction in air quality

7.2 Summary of Mitigation and Management

Table 7-2 to Table 7-4 provide a summary of the proposed project activities, environmental aspects and impacts on the receiving environment. Information on the frequency of mitigation, relevant legal requirements, recommended management plans, timing of implementation, and roles / responsibilities of persons implementing the EMPr. Table 7-5 dwells on the applicable standards.

Table 7-2: Project Activities Requiring Management

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Site Clearing	Construction	▪ It was assumed that 25% of the 345 ha will be cleared. Impact is limited to the site and immediate surroundings.	▪ Site clearing must be done in phases and use of suppressants and binders on exposed areas to reduce dust generation; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging or scraping must occur, especially on windy days (with wind speed ≥ 5.4 m/s); ▪ The drop heights when loading onto trucks and at tipping points should be minimised; ▪ Dust suppression must take place on exposed surfaces.	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013). ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) – National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 Microns Meters ($PM_{2.5}$) ▪ Ambient Air Quality - Limits for Common Pollutants, SANS1929:2005.	▪ Mitigation measures should be implemented prior to the commencement of this activity.
Mine Development: Headgear, Sinking Shafts and Vent Raises	Construction	▪ Small area, impact will be limited to the site and immediate surroundings.	▪ Activity must be carried out judiciously to ameliorate dust emissions.	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) – National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 Microns Meters ($PM_{2.5}$) ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).	▪ Mitigation measures should be implemented prior to the commencement of this activity.

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Access/ haul roads and storm water drains/berms	Construction	▪ Impact will be local extending across the site to nearby settlements.	▪ The drop heights when loading and offloading construction material should be minimised; ▪ The use of dust suppressants and binders on haul roads to reduce dust generation; ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced; and ▪ Monitoring of dust deposition rates and PM_{10}	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.	▪ Mitigation measures should be implemented prior to the commencement of this activity.
Generation of power using diesel generators (<10 MW)	Construction	▪ The region generally can be affected by emissions from this source.	▪ Use of low sulfur diesel; ▪ Selective catalytic reduction technology; ▪ Gas scrubbers; and ▪ Monitoring of gases	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005. National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) – National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 Microns Meters ($PM_{2.5}$)	▪ Mitigation measures should be implemented prior to the commencement of this activity.
Crushing: Waste Rock Crusher/Mine Crushers	Operational	▪ Impact will be localized, extending across the site to nearby settlements.	▪ Use of water sprays; ▪ Enclosure of crushers; and ▪ Monitoring of dust deposition rates and PM_{10}	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) – National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 Microns Meters ($PM_{2.5}$) ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.	▪ Mitigation measures must commence prior to the start of operation and for the project life.

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Hauling: Internal mine roads, haul roads and access roads	Operational	▪ Impact will be localized, extending across the site to nearby settlements.	▪ The use of dust suppressants and binders on haul roads to reduce dust generation; ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced; and ▪ Monitoring of dust deposition rates and PM10	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) – National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 Microns Meters ($PM_{2.5}$) ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.	▪ Measurement must commence prior to the start of operation and for the project life.
Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	Operational	▪ Impact will be localized, extending across the site to nearby settlements.	▪ The drop heights when loading and tipping points should be minimised; ▪ The use of dust suppressants and binders on exposed areas; ▪ Routine maintenance and vegetation of side walls of storage facilities i.e. topsoil and waste stockpile throughout the lifespan of the mine to avoid exposing surfaces to wind erosion. ▪ Monitoring of dust deposition rates and PM10	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; and ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.	▪ Measurement must commence prior to the start of operation and for the project life.
Mining Processes: Production Shafts and Vent Raises	Operational	▪ Impact will be limited to the Project site.	▪ Ensure fans are in good working condition – so vent emissions are within compliance; and ▪ Monitoring of air quality underground to ensure personnel are not exposed.	▪ Mine Health and Safety Act, 1996 (Act No. 29 of 1996)	▪ Measurement must commence prior to the start of operation and for the project life.

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Demolition & removal of all infrastructure	Decommissioning	▪ Impact will be limited to the site and immediate surroundings.	▪ The dismantling area disturbed must be kept to a minimum; ▪ Drop heights when offloading must be minimised; and ▪ Limit demolition activities to non-windy days.	▪ National Environmental Management: Air Quality Act, Act.39 of 2004, 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), National Dust Control Regulations (2013).	▪ Mitigation measures should be implemented prior to the commencement of this activity.

Table 7-3: Potential Impacts and Outcomes of the EMPr

Activities	Potential Impacts	Phase	Mitigation	Standard to be Achieved/Objective
Site clearing	▪ Reduction in the quality of air due to dust generation and wind erosion	▪ Construction	▪ The use of dust suppressants and binders on exposed areas to reduce dust generation; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging or scraping must occur, especially on windy days (with wind speed ≥ 5.4 m/s); ▪ The drop heights when loading onto trucks and at tipping points should be minimised.	▪ South African National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).
Mine Development: Headgear, Sinking Shafts and Vent Raises	▪ Reduction in the quality of air due to dust generation and wind erosion	▪ Construction	▪ The area of disturbance at all times must be kept to a minimum	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013); ▪ Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
Access/ haul roads and storm water drains/berms	▪ Reduction in the quality of air due to dust generation and wind erosion	▪ Construction	▪ The use of dust suppressants and binders on haul roads to reduce dust generation; ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced; and ▪ Monitoring of dust deposition rates and PM_{10}	▪ National Environmental Management: Air Quality Act, Act.39 of 2004;and ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.

Activities	Potential Impacts	Phase	Mitigation	Standard to be Achieved/Objective
Generation of power using diesel generators (<10 MW)	▪ Reduction in air quality due to gaseous emissions	▪ Construction	▪ Use of low sulfurs diesel; ▪ Selective catalytic reduction technology; ▪ Gas scrubbers; and ▪ Monitoring of gases	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005. ▪ National Environmental Management: Air Quality Act (Act.39 of 2004) – Listed Activities and Associated Minimum Emission Standard, 2013.
Crushing: Waste Rock Crusher/Mine Crushers	▪ Reduction in the quality of air due to dust generation and wind erosion	▪ Operational	▪ Use of water sprays; ▪ Enclosure of crushers; and ▪ Monitoring of dust deposition rates and PM_{10}	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; and ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.
Hauling: Internal mine roads, haul roads and access roads	▪ Reduction in the quality of air due to dust generation and wind erosion	▪ Operational	▪ The use of dust suppressants and binders on haul roads to reduce dust generation; ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced; and ▪ Monitoring of dust deposition rates and PM_{10}	▪ National Environmental Management: Air Quality Act, Act.39 of 2004;and ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.
Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	▪ Reduction in the quality of air due to dust generation and wind erosion	▪ Operational	▪ The drop heights when loading and tipping points should be minimised; ▪ The use of dust suppressants and binders on exposed areas; ▪ Routine maintenance and vegetation of side walls of storage facilities i.e. topsoil and waste stockpile throughout the lifespan of the mine to avoid exposing surfaces to wind erosion. ▪ Monitoring of dust deposition rates and PM_{10}	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; and ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.

Activities	Potential Impacts	Phase	Mitigation	Standard to be Achieved/Objective
Mining Processes: Production Shafts and Vent Raises	▪ Reduction in air quality due to release of gases and particulate matter from vent raise.	▪ Operational	▪ The area of disturbance at all times must be kept to a minimum	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013); ▪ Mine Health and Safety Act, 1996 (Act No. 29 of 1996).
Demolition & removal of materials	▪ Reduction in the quality of air due to dust generation and wind erosion.	▪ Decommissioning	▪ The dismantling area disturbed must be kept to a minimum; ▪ Drop heights when offloading must be minimised; and ▪ Limit demolition activities to non-windy days.	▪ National Environmental Management: Air Quality Act, Act.39 of 2004, 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), National Dust Control Regulations (2013).

Table 7-4: Proposed Mitigation and Management Measures

Activities	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
Site clearing	▪ Reduction in air quality due to dust generation	▪ Air Quality	▪ The use of dust suppressants and binders on haul roads to reduce dust generation; ▪ Limit activity to non-windy days; ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced; ▪ The area of disturbance at all times must be kept to a minimum and no unnecessary clearing, digging or scraping must occur, especially on windy days (with wind speed ≥ 5.4 m/s); ▪ The drop heights when loading onto trucks and at tipping points should be minimised.	▪ Must be carried out concurrently with mining operations	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).
Mine Development: Headgear, Sinking Shafts and Vent Raises	▪ Reduction in air quality due to dust generation	▪ Air Quality	▪ The area of disturbance at all times must be kept to a minimum	▪ Must be carried out concurrently with mining operations	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).

Activities	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
Access/ haul roads and storm water drains/berms	▪ Reduction in air quality due to dust generation	▪ Air Quality	▪ The drop heights when loading and offloading construction material should be minimised; ▪ The use of dust suppressants and binders on haul roads to reduce dust generation; ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced; and ▪ Monitoring of dust deposition rates and PM_{10}	▪ Must be carried out concurrently with mining operations	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005. ▪ National Environmental Management: Air Quality Act (Act.39 of 2004) – Listed Activities and Associated Minimum Emission Standard, 2013.
Generation of power using diesel generators (<10 MW)	▪ Reduction in air quality due to emission of gases	▪ Air Quality	▪ Use of low sulfur diesel; ▪ Selective catalytic reduction technology; ▪ Gas scrubbers; and ▪ Monitoring of gases	▪ Must be carried out concurrently with mining operations	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005. ▪ National Environmental Management: Air Quality Act (Act.39 of 2004) – Listed Activities and Associated Minimum Emission Standard, 2013.
Crushing: Waste Rock Crusher/Mine Crushers	▪ Reduction in air quality due to dust generation	▪ Air Quality	▪ Use of water sprays; ▪ Enclosure of crushers; and ▪ Monitoring of dust deposition rates and PM_{10}	▪ Must be carried out concurrently with mining operations	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; and ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.
Hauling: Internal mine roads, haul roads and access roads	▪ Reduction in air quality due to dust generation	▪ Air Quality	▪ The use of dust suppressants and binders on haul roads to reduce dust generation; ▪ There is need to set maximum speed limits on haul roads and to have these limits enforced; and ▪ Monitoring of dust deposition rates and PM_{10}	▪ Must be carried out concurrently with mining operations	▪ National Environmental Management: Air Quality Act, Act.39 of 2004;and ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.

Activities	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
Stockpiling: Waste Rock Berm, Waste Rock Stockpile, High Grade and Low Grade Ore	▪ Reduction in air quality due to dust generation	▪ Air Quality	▪ The drop heights when loading and tipping points should be minimised; ▪ The use of dust suppressants and binders on exposed areas; ▪ Routine maintenance and vegetation of side walls of storage facilities i.e. topsoil and waste stockpile throughout the lifespan of the mine to avoid exposing surfaces to wind erosion. ▪ Monitoring of dust deposition rates and PM_{10}	▪ Must be carried out concurrently with mining operations	▪ National Environmental Management: Air Quality Act, Act.39 of 2004; and ▪ Ambient air quality - Limits for common pollutants, SANS1929:2005.
Mining Processes: Production Shafts and Vent Raises	▪ Reduction in air quality due to dust generation	▪ Air Quality	▪ Ensure fans are in good working condition – so vent emissions are within compliance; and ▪ Monitoring of air quality underground to ensure personnel are not exposed.	▪ Must be carried out concurrently with mining operations	▪ Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
Demolition & removal of all infrastructure	▪ Reduction in air quality due to dust generation	▪ Air Quality	▪ The dismantling area disturbed must be kept to a minimum; ▪ Drop heights when offloading must be minimised; and ▪ Limit demolition activities to non-windy days.	▪ Must be carried out once mining operation ceases.	▪ National Environmental Management: Air Quality Act, Act.39 of 2004, 2004; ▪ National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), National Dust Control Regulations (2013).

Table 7-5: Prescribed Environmental Management Standards, Practice, Guideline, Policy or Law

Specialist field	Applicable standard, practice, guideline, policy or law
Air quality	National Environmental Management: Air Quality Act, Act.39 of 2004, 2004
	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013)
	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) – National Ambient Air Quality Standard for Particulate Matter with Aerodynamic Diameter less than 2.5 Microns Meters ($PM_{2.5}$)
	National Environmental Management: Air Quality Act (Act.39 of 2004) – Listed Activities and Associated Minimum Emission Standard (2013).

8 Monitoring Programme

Ivanplats will be responsible for the implementation of all monitoring actions. The recommended monitoring actions for the identified impacts are detailed below. Ivanplats will also be responsible for keeping a record of all environmental monitoring undertaken for the Project.

8.1.1 Dust Monitoring Programme

The existing dust monitoring networks in the area should be maintained during the life of the Project. As and when necessary, Ivanplats can undertake a regular review and update of these networks. GAA recently undertook a review of the dust monitoring points and amended as follows due to the distribution of the network not allowing for the separation of dust generated on site to that generated within the local communities; and the siting of the points not accounting for the infrastructure built on site and thus source apportionment.

Table 8-1: Monitoring Points

Site	Lat	Long	Requirement
Plat 01	24° 7.118'S	28° 57.802'E	To be decommissioned
Plat 02	24° 7.809'S	28° 57.527'E	To be decommissioned
Plat 03	24° 7.416'S	28° 58.948'E	To be decommissioned
Plat 04	24° 5.531'S	28° 59.611'E	To be decommissioned
Plat 05	24° 4.577'S	28° 58.654'E	To be maintained in current location
Plat 06	24° 5.156'S	28° 56.940'E	To be maintained in current location
Plat 07	24° 5.997'S	28° 58.005'E	To be decommissioned
Plat 08	24° 3.597'S	28° 58.597'E	To be decommissioned
Plat 09	24° 5.005'S	28° 57.540'E	To be moved to the AQ monitoring station at approximately 24° 5.113'S 28° 57.574'E
Plat 10	24° 5.951'S	28° 57.639'E	New optimised site for operational monitoring
Plat 11	24° 5.528'S	28° 57.668'E	New optimised site for operational monitoring
Plat 12	24° 5.109'S	28° 57.934'E	New optimised site for operational monitoring
Plat 13	24° 4.809'S	28° 57.977'E	New optimised site for operational monitoring
Plat 14	24° 5.060'S	28° 57.256'E	New optimised site for operational monitoring

Site	Lat	Long	Requirement
Plat 16	24° 4.538'S	28° 57.193'E	New optimised site for operational monitoring

8.1.2 PM_{10} Monitoring Programme

Ivanplats management should install additional PM_{10} monitor – to establish ambient levels of this pollutant at a receptor site and operational site. Such data will be useful, if in future the Project comes under scrutiny from regulatory authorities. Monitoring sites should be placed judiciously downwind and preferably at a residential receptor site(s). There must be a programme in place to ensure the monitors are calibrated annually to ensure the integrity of the measured data.

8.1.3 Gaseous Monitoring Programme

It is recommended that once operation commences, isokinetic sampling of generator stacks be conducted, at least once a year. In addition to the aforementioned, ground level concentrations of gaseous pollutants i.e. SO_2, NO_2, CO, and CO should be monitored. The proposed ambient monitoring must be a continuous process for the life of the Project to assess public exposure at the nearest residential receptor(s).

9 Relevant Stakeholder Consultation

No consultation, outside of the formal stakeholder engagement process, was undertaken. This report will be made available for public comment and any consultation required as a result will be undertaken.

10 Relevant Comments and Responses

This section aims to provide a summary of the comments, issues and/or queries received during the public consultation process undertaken during the EIA amendment process that are of relevance to this specialist study. Responses will be provided once comments are received and the report will be updated accordingly.

11 Conclusion and Recommendation

An AQIA was undertaken to assess the proposed amendments to the Project footprint and location of certain activities/infrastructure. Pollutants quantified and evaluated in the assessment included dust fallout, fine particulate matter (PM_{10} and $PM_{2.5}$) as well as gaseous pollutants (SO_2, NO_2 and CO).

The model predications presented in this report have shown that there are instances were dust fallout rate, daily PM_{10} and $PM_{2.5}$, and hourly NO_2 and SO_2 values exceeded recommended standards. It is worth mentioning that these exceedances are not confined to the Project area, rather, surrounding environments are affected. The crusher and haul roads

represent the highest contributors. Adequate mitigation measures as suggested in this report will help reduce the ambient particulate matter loading from these sources.

Also, removal of gaseous emissions through wet or dry scrubbing (oxides of nitrogen can be removed by addition of ammonia at the right temperature), a process known as selective catalytic reduction. Sulfur dioxide can be scrubbed out using calcium carbonate.

Results of the dispersion modelling exercise, coupled with the impact assessment ratings conducted show that impacts will be negligible to moderate. Model predictions showed that emissions from the crushers and haul roads are the mains contributors to dust deposition, PM_{10} and $PM_{2.5}$. While gaseous emissions such as CO, SO_2 and NO_2 were solely from the diesel generators. The main findings of this AQIA study are summarised as follows:

- Predicted PM_{10} levels are high in the Project area and surroundings respectively. The predicted concentrations at five receptor sites were in exceedance of the current standard (75 µg/m3) without mitigation measures in place.
- The levels of $PM_{2.5}$ predicted for the project area are higher than the current South African standards (40 µg/m^3). However, with appropriate mitigation applied, ambient concentrations of this pollutant can be further lowered.
- Dust deposition rates predicted for the proposed Platreef Mine are high with emissions from dirt roads and crushing being the largest contributors. However, model predictions show that only site PLA6 (Ga-Kgobudi) will be in exceedance after mitigation measures were applied.

For the gaseous pollutants from the diesel generators (<10 MW) as a source of air pollution:

- The predicted NO_2 concentrations simulated at the proposed mining area are high. The hourly concentration exceeded the current limit (200 µg/m^3) at the western and southern boundary.
- Predicted annual concentrations of NO_2 are within the South African standard (40 µg/m^3), within the project area and beyond.
- The 1-hour SO_2 concentrations predicted at the proposed mining area are higher than the recommended South African standard of 350 µg/m^3 at the western and southern boundary.
- The 24-hours predicted concentrations of SO_2 are within the South African standard of 125 µg/m^3. Predicted concentrations at sensitive receptors were within limit.
- The predicted annual concentrations of SO_2 are within the South African standard 50 µg/m^3 at the mine boundary and selected sensitive receptors.
- The predicted maximum hourly concentrations of CO are within the regulatory limit value. No exceedance of the South African standard of 30,000 µg/m^3 was predicted.

In conclusion, the proposed amendments will not result in new significant impacts other than those associated with emissions from the diesel generators. However, if the crusher is

enclosed with dust extraction system and fitted with water spray, use of dust suppressant on roads and exposed areas, use of selective catalytic technology and gas scrubbers for the generators impact will be reduced to within compliance. It is predicted that particulate and gaseous emissions will have negligible to moderate impacts on air quality post mitigation. Hence, it is recommended that mitigation measures are factor into the design and in place prior to the commencement of mining.

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Appendix A: Declaration of Independence and Specialist CV

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I, Matthew Ojelede as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Ivanplats (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the proposed Underground Mine, near Mokopane, Limpopo Province.



Full Name	Matthew Ojelede
Title / Position	Air Quality Specialist
Qualifications	PhD
Experience (Years)	7 Years
Registration	NACA, SASAS and IAIA

MATTHEW OJELEDE

Dr Matthew Ojelede

Division: Natural Sciences

Unit Manager: Atmospheric Sciences

Digby Wells Environmental

1 EDUCATION

BSc (Hons) Geology (University of Benin, Edo State, Nigeria)
MSc Environmental Science (WITS) with course work:

- Environmental Chemistry
- Environmental Management
- Air Quality –Physics and Chemistry of the Urban Atmosphere
- Global Environmental Change: Adaptation and Mitigation
- Geographic Information System
- Mining and the Environment

PhD Environmental Management (UJ)

2 LANGUAGE SKILLS

English and Edo language

3 EMPLOYMENT

June 2012 – September 2012	University of Johannesburg (Researcher)
October 2012 to present	Digby Wells Environmental

4 EXPERIENCE

Once actively involved in air quality research projects for several mining companies i.e. Crown Gold Recoveries, Eastplat, Anglogold Ashanti amongst other. In the recent past, a prominent member of a group of researchers from the University of the Witwatersrand, University of Pretoria and the National Health Laboratory Service (NHLS) in looking at the "Adverse Health Impacts Associated with Dust Emissions from Gold Mine Tailings" for the Mine Health and Safety Council. Five years' experience in ambient air quality monitoring, analysis and interpretation of data.

Countries worked in: South Africa, Mali, Mozambique, Malawi and Liberia

5 EXPERIENCE

Relevant Experience

- Seven years' experience as research assistant in atmospheric sciences
- Five years' experience in air quality management consulting to the mining sector
- Author of academic articles
- Conducted a number of Air Quality Impact Assessment Studies in Liberia, Malawi, Mali, Mozambique and South Africa.

Project Experience

AIR QUALITY BASELINE ASSESSMENTS, EMISSION INVENTORIES, DISPERSION MODELLING AND AIR QUALITY MANAGEMENT AND MITIGATION PLANS

Air Quality Impact Assessment study for an IPP power station and associated infrastructure, Limpopo, South Africa

Ventersburg Gold Mine Air Quality Impact Assessment study, Free State, South Africa

Air Quality Baseline Assessment study for Falea Uranium Project, Mali

Air Quality Scoping report for the Harwar Colliery Mpumalanga, South Africa

Baseline Air Quality Assessment study for Mkango Resources Limited, Songwe Rare Earth project, Malawi

Air Quality Impact Assessment study for the proposed Balama Graphite Mine, Mozambique

Air Quality Impact Assessment study for New Liberty Gold Mine, Liberia

Air Quality Impact Assessment study for Loulo Gold Mine, Mali

6 PROFESSIONAL AFFILIATIONS

National Association for Clean Air (NACA)

South African Society for Atmospheric Sciences (SASAS)

Geo Information Society of South Africa (GISSA)

International Association of Impact Assessment South Africa (IAIAsa)

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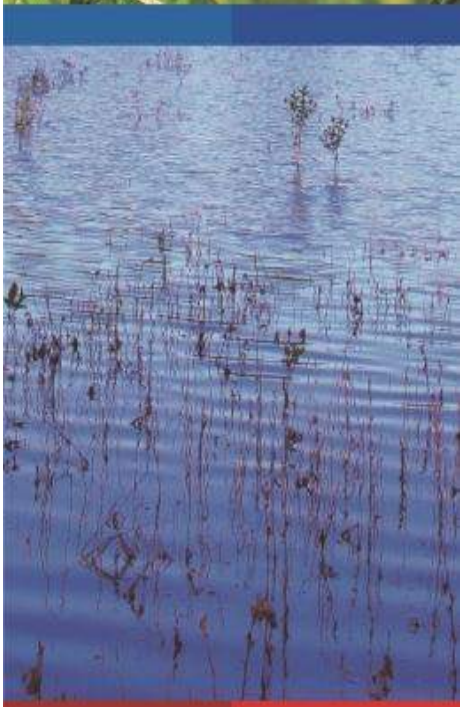
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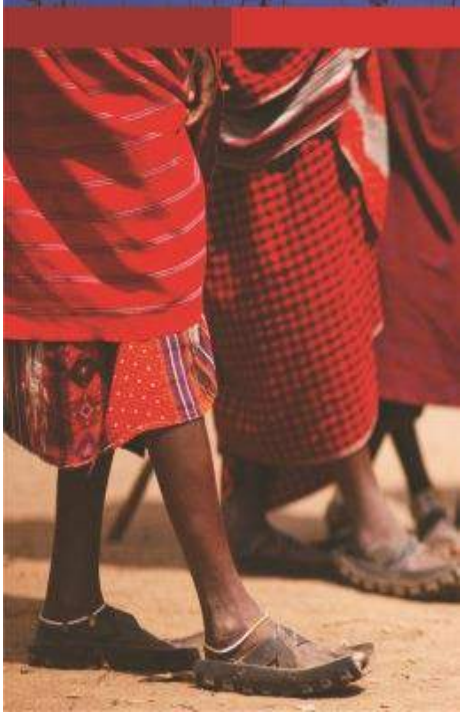
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Appendix F: Addendum Heritage Impact Assessment Report







DIGBY WELLS
ENVIRONMENTAL

Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province

Heritage Impact Assessment Addendum Report

Project Number:

IVA3396

Prepared for:

Ivanplats (Pty) Ltd

January 2016

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This document has been prepared by Digby Wells Environmental.

Report Type:	**Heritage Impact Assessment Addendum Report**
Project Name:	**Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province**
Project Code:	**IVA3396**

Name	Responsibility	Signature	Date
Justin du Piesanie Heritage Resources Management Consultant: Archaeologist ASAPA Member No 270	Report Compilation		December 2015
Natasha Higgitt Assistant Heritage Consultant ASAPA Membership No: 335	Pre-disturbance survey and Technical Review		December 2015
Michael Hennessy	Internal Review		January 2016
Lucy Koeslag	Exco Review		January 2016

This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.

EXECUTIVE SUMMARY

Ivanplats (Pty) Ltd (hereafter Ivanplats) has undertaken to develop and operate an underground platinum mine near Mokopane, Limpopo Province (the Project). Ivanplats is currently the holder of an approved Mining Right (LP30/5/1/2/2/10067MR) issued by the Department of Mineral Resources (DMR). Subsequent to the issuing of this mining right, residential encroachment of the planned mining area has necessitated the need for an amendment to the approved mine layout plan. Digby Wells Environmental (Digby Wells) has been appointed by Ivanplats to review these amendments and identify and assess any additional impacts that may result from these amendments.

The Scope of Work included a survey of new proposed infrastructure to identify any heritage resources that would be affected by the proposed amendments. In particular, the re-routing of a 4.84 km section of the Tailings Storage Facility (TSF) pipeline and the new 3.02 km storm water drain were surveyed.

A total of seven heritage resources were identified along the amended infrastructure. Six of the identified heritage resources were graves and/or burial grounds, of which 2 burial sites had previously been identified as part of the HIA completed by Digby Wells in 2013 for the Mining Right Application and four newly identified burial sites as part of this survey. The new burial sites do not form part of the current Burial Grounds and Graves (BGG) Consultation process. The burial grounds were given a very high cultural significance (CS). The impact assessment on the burial grounds showed that a major negative impact would occur without relevant mitigation.

Additionally, one Iron Age surface occurrence was identified along the TSF pipeline, however it was not found *in-situ* and was given a negligible CS and not assessed further.

Heritage impacts to the identified burial grounds and graves were identified and assessed in relation to the re-routing of a section of the TSF pipeline and new storm water drain. Heritage impacts may manifest as either changes to the physical integrity of the sites due to certain activities, or changes to the intangible nature of the burial grounds from restricted and / or loss of access.

All identified burial grounds and graves within close proximity or within the development footprint of the linear infrastructure must, at a minimum:

- Adhere to the management procedures detailed under Section 8.3.4: Cemeteries and Graves of the Platreef Project Conservation Management Plan (CMP) (2016); and
- Be subject to a burial grounds consultation and relocation process. The current Burial Grounds and Graves (BGG) Consultation process being undertaken could be extended to include the new burial sites.

The consultation process must be completed in accordance with Chapter XI of the NHRA Regulations (GN R 548) and aim to:

- Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves;
- Consult with identified stakeholders regarding the effect of the Project on graves; and
- Reach agreement with stakeholders on the future of identified graves, to retain sites *in situ* or exhume, relocate and reinter the contents of graves.

Where burial grounds and graves are located in areas where *in situ* preservation is possible, for example on the proposed linear infrastructure boundaries, mitigation must consider redesigning proposed routing options to exclude burial grounds from the development footprints. Consultation with stakeholders will, however, still be required to reach agreement on the *in situ* conservation, including access requirements. The following minimum buffer zones are recommended for gravesites that may be conserved *in situ*:

- At least 15 m from any linear infrastructure footprints such as pipelines, roads or conveyors, including servitudes;
- At least 25 m from other infrastructure footprints such as offices, parking areas, etc.; and
- At least 100 m from open pit areas.

Furthermore, it is recommended that a Watching Brief be undertaken during the construction. This will entail a qualified and accredited archaeologist on site during earth moving activities to assess and guide construction to minimise the risk of damage to burial grounds and graves.

Where burial grounds and graves are located in areas where *in situ* conservation will not be feasible or will be unsafe, mitigation must consider the exhumation and relocation of graves within the current process being undertaken. Exhumation and relocation is a permitted activity in accordance with Section 36(3) of the NHRA, and regulated by Chapters IX and XI of the NHRA: Regulations (GN R 548).

ACRONYMS

Abbreviation	Meaning
ASAPA	Association of Southern African Professional Archaeologists
BA	Bachelor of Arts
BGG	Burial Ground and Graves
BGGC	Burial Ground and Graves Consultation
BID	Background Information Document
BSc	Bachelor of Science
c.	circa, meaning approximately
CMP	Conservation Management Plan
CRR	Comments and Response Report
Digby Wells	Digby Wells Environmental
EAP	Environmental Assessment Practitioner
EFC	Early Farming Community (also known as Early Iron Age)
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Programme
ESA	Early Stone Age
GIS	Geographical Information System
GPS	Global Positioning System
GRP	Grave Relocation Plan
HBE	Historical built environment
HIA	Heritage Impact Assessment
Hons	Honours degree
HRM	Heritage Resources Management
ICOMOS	International Council on Monuments and Sites
LFC	Late Farming Community also known as Late Iron Age
LIHRA	Limpopo Heritage Resources Authority
LoM	Life of Mine
LSA	Late Stone Age
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA	Middle Stone Age
MSc	Master of Science
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notification of Intent to Develop
NoK	Next-of-Kin
RoD	Record of Decision
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SEP	Stakeholder Engagement Process
STP	Shovel Test Pit

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Appendix A: Declaration of Independence and Specialist CV

1 Introduction

Ivanplats (Pty) Ltd (hereafter Ivanplats) has undertaken to develop and operate an underground platinum mine near Mokopane, Limpopo Province (the Project). Ivanplats is currently the holder of an approved Mining Right (LP30/5/1/2/2/10067MR) issued by the Department of Mineral Resources (DMR). Subsequent to the issuing of this mining right, residential encroachment of the planned mining area has necessitated the need for an amendment to the approved mine layout plan. Digby Wells Environmental (Digby Wells) has been appointed by Ivanplats to review these amendments and identify and assess any additional impacts that may result from these amendments.

This report serves as an addendum to the existing heritage specialist report compiled for the Platreef Project which was submitted to the South African Heritage Resources Agency (SAHRA) and Limpopo Heritage Resources Authority (LIHRA) via the South African Heritage Resources Information System (SAHRIS) on 11 October 2013 and approved on 8 November 2013 (Case ID: 566[1]).

1.1 Project Background

The Project is located on the farms Macalacaskop 243 KR and Turfspruit 241 KR with the construction of a Tailings Storage Facility (TSF) on the farm Rietfontein 2 KS. These properties lie within the Northern Limb of the Bushveld Igneous Complex (BIC), approximately 280 km northeast of Johannesburg and 8 km northwest of the town of Mokopane (formerly known as Potgietersrus) in Limpopo Province of South Africa (see Table 1-1).

Table 1-1: Location Data of the Project

Province	Limpopo Province
Magisterial District / Local Authority	Mokopane Magisterial District
Local Authority	Waterberg District Municipality
Municipality	Mogalakwena Local Municipality
Property Name and Number	Turfspruit 241 KR Macalacaskop 243 KR Rietfontein 2 KS
1: 50 000 Map Sheet	2428BB Tinmyne and 2429AA Mokopane
GPS Co-ordinates (relative centre point of study area)	East/LON/X: -24.113113
	South/LAT/Y: 28.965987

[1] http://www.sahra.org.za/sahris/cases/pla1677platreefplatinumproject

The DMR issued Ivanplats with a Mining Right for this operation on 04 December 2014. Consequent to the granting of the licence, Ivanplats has commenced with the sinking of one of the planned mine production shafts (i.e. Shaft 1) and the development of certain project infrastructure, such as the installation of a mine boundary fence.

Furthermore, Ivanplats has also initiated heritage management measures for the Platreef Project. This includes the development of a Conservation Management Plan (CMP), and implementation of a Burial Grounds and Graves Consultation (BGGC) process in support of potential exhumations.

1.2 Project Description

Prior to the establishment of the mine boundary fence, the approved planned mining area was encroached upon by surrounding communities. This encroachment has resulted in the need to reduce the approved 420 hectare (ha) mining area by 74 ha to exclude the surrounding communities. This reduction in the footprint area necessitated the need for Ivanplats to amend the approved mine layout plan through changes to the footprint area and location of certain activities or infrastructure.

This addendum to the specialist Heritage Impact Assessment (HIA) for the Platreef Project (Higgitt, 2013) considers this reduction in the footprint area, as well as specifically the potential impacts to identified heritage resources by activities associated with the re-routing of a 4.84 km section of the TSF pipeline, and the inclusion of the 3.02 km storm water drain not previously assessed[2]. Refer to Plan 1 for changes in project layout.

1.3 Terms of Reference

The Terms of Reference (ToR) for the Project heritage specialist study were to consider amendments to the mine layout plan, specifically the re-routing of a section of the TSF pipeline and the new storm water drain to:

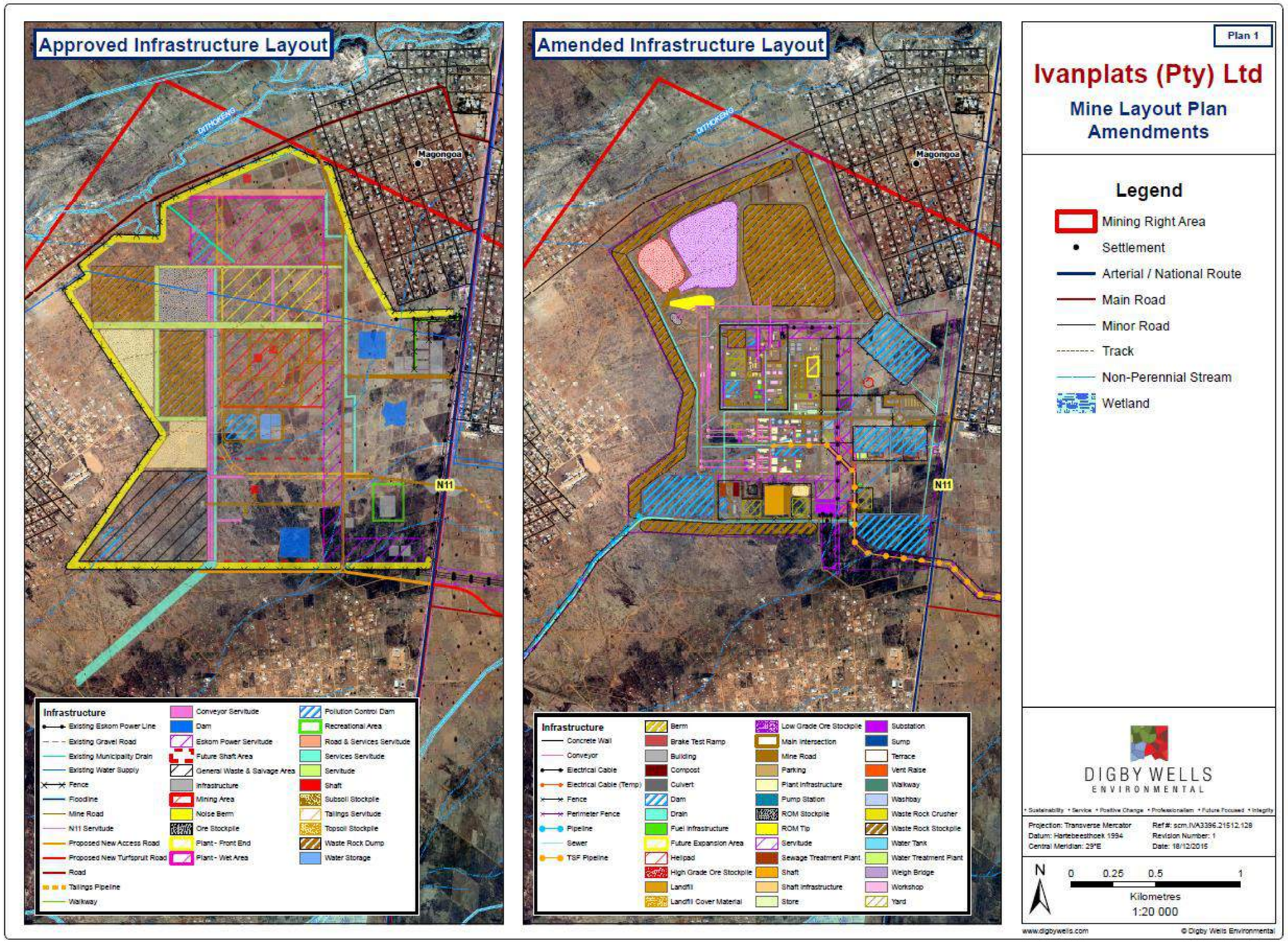
- Identify any new impacts to identified heritage resources;
- Complete an impact assessment based on the proposed amendments; and
- Provide specialist heritage resources management input into the addendum to the Environmental Impact Assessment (EIA) report.

[2] While the proposed routing option for the newly included storm water drain was not previously assessed as part of the specialist HIA completed in 2013, this amendment to the approved mine layout plan does not constitute a new listed activity in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

1.4 Aims and Objectives

The primary aim of this addendum to the specialist HIA for the Platreef Project (Higgitt, 2013) is to assess the proposed changes to the mine layout plan in relation to the identified heritage resources. The specific objectives include the following:

- Assess possible levels of change to identified heritage resources that may result from the proposed amendments;
- Identify any limitation or conditions to be applied to the proposed amendments; and
- Determine what general protections apply in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), and what formal protections may be consequently applied.



Plan 1: Comparative Project Layout

2 Specialist Details

Natasha Higgitt undertook the pre-disturbance survey and completed a technical review of this report. She obtained her Bachelor of Arts (BA) Honours degree in Archaeology in 2010 from the University of Pretoria. She held the position of Assistant Heritage Consultant: Archaeology Specialist at Digby Wells. She has more than 5 years' experience in archaeological survey and gained further generalist heritage experience since her appointment at Digby Wells in South Africa and Liberia.

Natasha is a professional member of the Association of Southern African Archaeologists (ASAPA) (*Member No. 335*).

Justin du Piesanie compiled the addendum to the specialist HIA report. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. Justin also attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. He currently holds the position of Heritage Management Consultant: Archaeologist at Digby Wells. He has over 10 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation and grave relocation. Justin has gained further generalist experience since his appointment at Digby Wells in Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with International Finance Corporation (IFC) requirements such as Performance Standard 8: Cultural Heritage.

Justin is a professional member of ASAPA (*Member No. 270*) and the International Council on Monuments and Sites (ICOMOS) South Africa (*Member No. 14274*).

3 Methodology

3.1 Qualitative Data Collection

This report utilised the information contained within the approved specialist HIA for the Platreef Project (Higgitt, 2013). No additional literature was consulted to inform the cultural baseline.

3.2 Quantitative Data Collection

A pre-disturbance survey of the proposed TSF pipeline, storm water drain routes and associated buffer zones was undertaken by Natasha Higgitt, on 1 December 2015. The objective of the survey was to:

- Visually record the current state of the cultural landscape;
- Ground truth certain heritage previously identified; and
- Record all tangible heritage resources within the amended / additional infrastructure footprints.

The survey was completed as an adaptive, non-intrusive survey (i.e. no sampling or Shovel Test Pits (STPs)) through both vehicular and pedestrian survey methodologies. The areas surveyed were recorded through GPS track log, and identified heritage resources through waypoints using handheld GPS and documented through written and photographic record.

4 Assumptions and Limitations

The following assumptions and limitations were noted during the compilation of this addendum to the specialist HIA for the Platreef Project (Higgitt, 2013):

- While every effort was undertaken to survey as extensively as possible, the relatively dense vegetation (i.e. *Dichrostachys cinerea* (sickle bush)) and ground cover imposed a visual limitation with regards to the extent that distinguishing settlement features or material culture could be identified during the pre-disturbance survey, as well as restricting access to the northern sections of the proposed TSF pipeline routing;
- Burial grounds and graves recorded during the pre-disturbance survey as completed through the identification of visible surface markers only. No consultation was undertaken as part of this addendum to the specialist HIA for the Platreef Project (Higgitt, 2013); and
- Archaeological sites commonly occur at sub-surface levels with no or limited trace evidence on the surface. To investigate the potential of subsurface occurrences, permits regulated under Section 35 of the NHRA are required. No permits were held by the specialists, and as such, it is possible that archaeological sites may be identified during the construction and operational phase of the Project.

5 Baseline Environment

5.1 Cultural Landscape Summary

This section of the addendum to the specialist HIA report presents an abbreviated summary of the cultural heritage baseline discussed in the approved HIA. Detailed information and sources cited are not repeated here for the sake of brevity.

The area under consideration for this report has a time depth that spans from the Early Stone Age (ESA) through to the historical period.

Evidence for the Stone Age is represented by archaeological sites, such as the Cave of Hearths in the Makapans Valley (part of the Fossil Sites of South Africa World Heritage Site (WHS), approximately 20 km east of the project site. In addition to this, several stone tool accumulations have been recorded through previous studies completed in the region, commonly found within water courses and pans. These accumulations have primarily been ascribed to the Middle (MSA) and Late Stone Age (LSA) outside of any discernible context.

The Stone Age in southern Africa is followed by the Farming Community Period (also known as the Iron Age). Ceramic classification is universally used by archaeologists to establish

relative cultural-historical temporal sequences within southern African Farming Communities. In this way, relative dates can be assigned to sites, as well as inferring tenuous cultural similarities or associations. Based on this method of seriation, occupation of the area under consideration by Bantu-speaking farming communities spans from the Early (EFC) through to the Late Farming Community (LFC) Period. Previous studies in the area indicate that several sites associated with the LFC period have been identified and recorded, comprising of isolated ceramic scatters and sites comprising of several components and varying levels of complexity. The ceramics provide evidence of Farming Community settlement from at least the 17th century CE continuing to the 19th century CE. The combination of the various ceramic facies and types of stonewalled sites provide evidence of long-term occupation by Kekana as well as other groups.

Within this region of South Africa, there is sufficient evidence to indicate the continuity from the LFC into the historic period[3], and that this division is largely artificial. The first recorded contact between Europeans and the Kekana occurred in 1837 with the arrival of the Voortrekkers at Louis Trichardt. Through time, the Voortrekkers settled throughout the region establishing Pietpotgietersrus (*today renamed Mokopane after Kekana chief Mugombane*) in the 1850s. The settlement of the Voortrekkers here increased tensions with the local Kekana inhabitants. These tensions culminated in the infamous 1854 siege of Mugombane at Makapansgat (part of the Fossil Sites of South Africa WHS). Subsequent to this event, the *Zuid-Afrikaansche Republiek* (ZAR) demarcated the three dominant chiefdoms, namely the Valtyn, Mapela and Bakenberg polities within the area under consideration through the establishment of a 17 km long, 5 km boundary within which these constructed polities were confined. The boundary was based where communities resided at the time. The consequence was the confinement of around 30 000 people within these limited borders, resulting in the loss of much traditional grazing and arable land. Under the ZAR, the post 1902 British Colonial administration and the 1910 Union administrations, official boundaries were continuously adjusted to the detriment of the three chiefdoms.

5.2 Results of Pre-Disturbance Survey

A pre-disturbance survey of the proposed TSF pipeline re-routing and storm water drain routing option was undertaken. The results of the pre-disturbance survey are presented in Table 5-1 below and Plan 2.

[3] The authors acknowledge that the recent historical landscape is complex: issues such as succession disputes are representative of an inherent complex and conflicted heritage that is the current subject of much research and public debate. However, a comprehensive study of these issues is outside the scope of this study.

Table 5-1: Heritage Resources Identified during the Pre-Disturbance Survey

5.2.1 IVA3396/2428BB/BGG-001 – Burial ground

Cultural Significance: Very High	**Co-ordinates**	
	-24.09377	28.97022

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA. BGG-001 can be described as a burial ground containing three graves located approximately 5 m from the proposed TSF pipeline re-routing. (See Figure 5-1 below). The burial ground is unfenced and unkempt, and located in a maize field. The tombstones were made from granite, and the middle tombstone had fallen over. Two of the graves could be dated (2003 and 2005).

BGG-001 has been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken (Ref: 48_01).



Figure 5-1: Burial Ground at BGG-001

5.2.2 IVA3396/2428BB/BGG-002 – Grave

Cultural Significance: Very High	Co-ordinates	
	-24.09331	28.97014

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA. BGG-002 can be described as a single grave located approximately 41 m from the proposed TSF pipeline re-routing (See Figure 5-2). The grave is located below a large Marula tree and unfenced. The headstone is a large lower grinding stone with a metal grave marker. No features to date the graves were noted.

This grave has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 5-2: Grave at BGG-002

5.2.3 IVA3396/2428BB/BGG-003 – Grave

Cultural Significance: Very High	Co-ordinates	
	-24.09678	28.98378

The site constitutes a potential burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-003 can be described as a potential grave located within the proposed TSF pipeline re-routing. BGG-003 was recorded due to the presence of a small metal cup at the base of a tree stump (See Figure 5-3). It is customary to leave cups or bottles at graves as gifts for the deceased. No features to date the graves were noted.

This grave has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 5-3: Potential Grave at BGG-003

5.2.4 IVA3396/2428BB/BGG-004 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.09760	28.99092

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-004 can be described as a burial ground containing two graves located approximately 5 m from the proposed TSF pipeline re-routing. (See Figure 5-4 below). The burial ground is unfenced and unkempt, and located in a maize field. The tombstones were made from granite and date to 1939 and 1941.

This burial ground has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 5-4: Burial Ground at BGG-004

5.2.5 IVA3396/2428BB/St-005 – Farming Community

Cultural Significance: Negligible	Co-ordinates	
	-24.09401	28.97037

The site constitutes surface scatters of material culture associated with the farming community period. Archaeological sites are generally protected under section 35 of the NHRA.

St-005 can be described as surface accumaltions of LFC ceramic sherds and a broken lower grinding stone located within the proposed TSF pipeline re-routing (See Figure 5-5). The pottery pieces were not diagnostic, but had indications of decorations i.e. straight lines and comb-stamped lines. The artefacts were not found *in-situ* due to agricultural activites, however there is a high possibility of additional heritage resources located sub-surface.

This site has been sufficiently recorded and is **not considered further** in this assessment.



Figure 5-5: Surface occurrence of Farming Community Artefacts at St-005

5.2.6 IVA3396/2428BB/BGG-006 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.10229	28.94401

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-006 can be described as a burial ground containing approximately 40 graves located approximately 129 m from the proposed storm water drain route (See Figure 5-6). The burial ground is fenced and marginally kempt. Several of the graves had granite tombstones, while other graves were simple stone circles. There were no features to date the stone graves.

BGG-006 has been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken (Ref: 52_01).



Figure 5-6: Burial Ground identified at BGG-006

5.2.7 IVA3396/2428BB/BGG-007 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.11078	28.93334

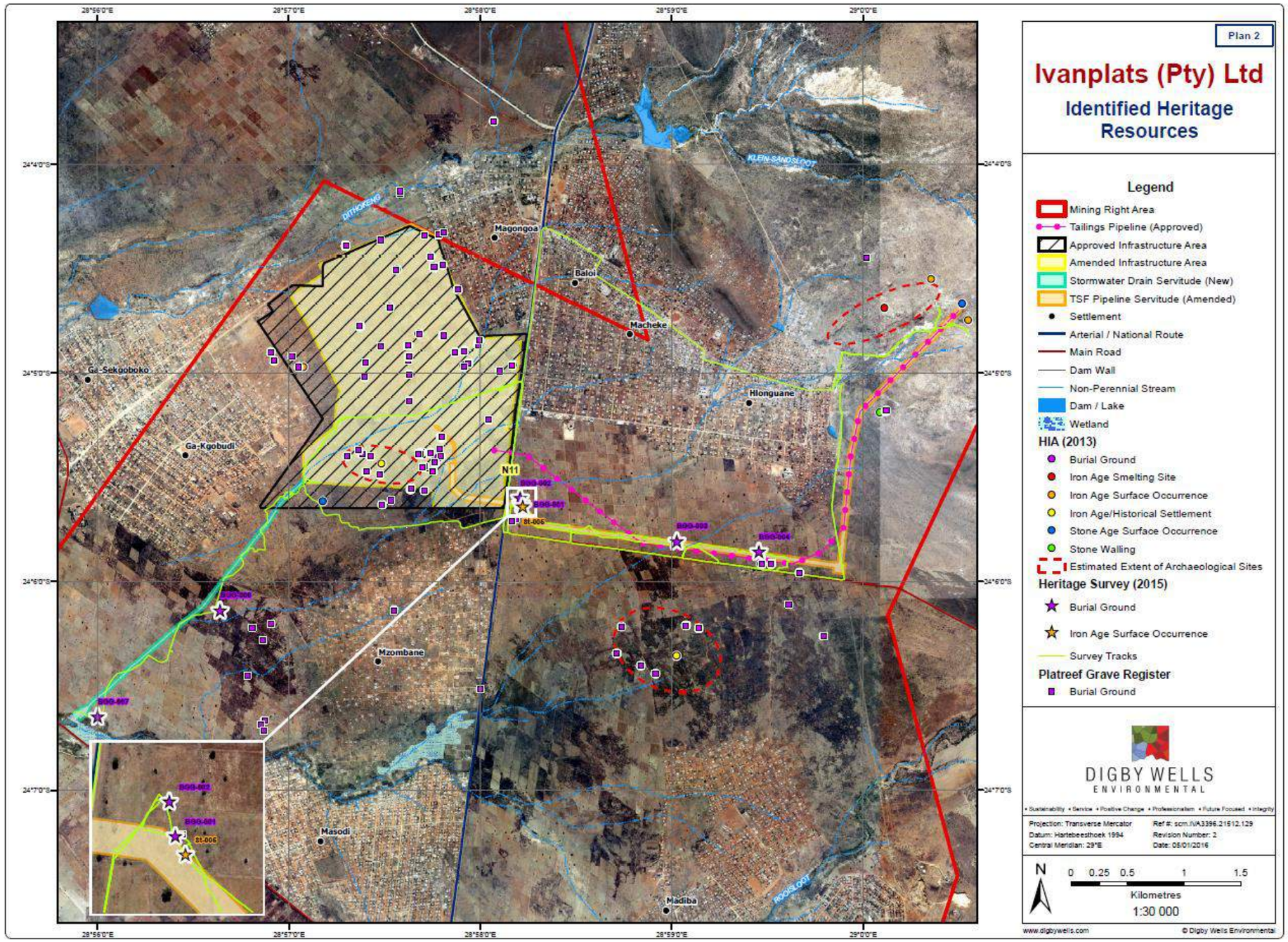
The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-007 can be described as a burial ground containing at least 15 graves located approximately 100 m from the proposed storm water drain route (See Figure 5-7). The burial ground is fenced and marginally kempt. One of the burials had a granite tombstone, while the remaining burials were simple stone circles. There were no features to date the stone graves.

BGG-007 has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 5-7: Burial Ground identified at BGG-007



Plan 2: Identified Heritage Resources

6 Sensitivity Analysis and No-Go Areas

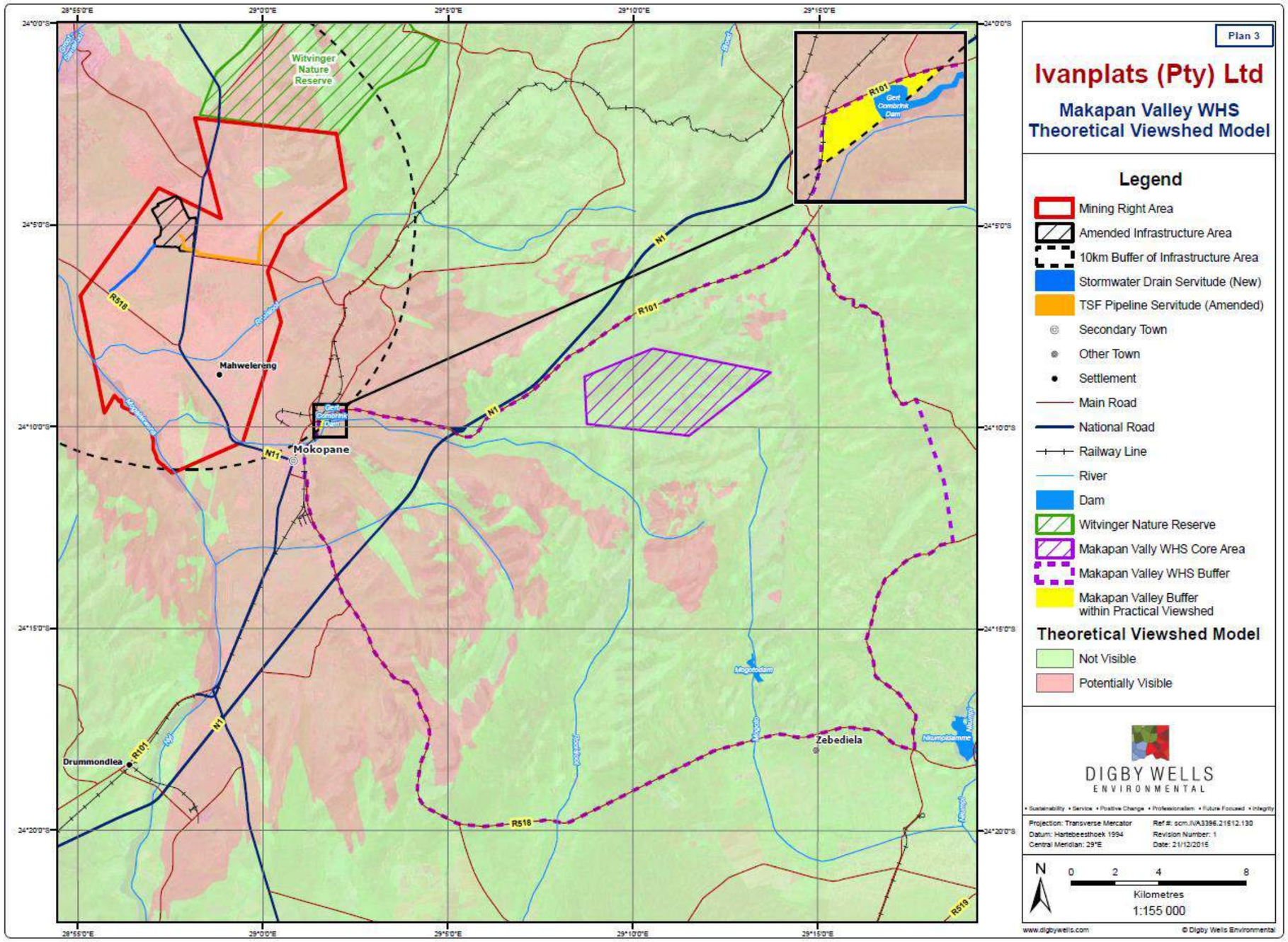
The Makapan Valley, as part of the Fossil Sites of South Africa (WHS) (hereafter referred to as the Makapan WHS) occurs approximately 17 km east of the Project. The immediate Makapan WHS footprint is 2 220 ha with a buffer area that extends 48 065 ha (Government Gazette GR. 1197 of 2007).

This is a highly sensitive area and can be considered as a 'no-go'. All potential impacts to the Makapan WHS must be considered. Environmental noise, air quality and visual assessments considered the Makapan WHS during the compilation of the Platreef Project EIA. The results of these specialist studies indicated that the core Makapan WHS would not be impacted upon by the Project.

An addendum to the specialist Visual Impact Assessment (VIA)[4] was completed as part of the overall study to assess an increase in height of several infrastructure areas and structures which may result in increased visibility. The updated VIA showed that the area of impact to the buffer zone of the Makapan WHS site has increased as a result of the proposed infrastructure changes. Previously, 16.73% of the buffer zone was affected visually by the Platreef Project. The closest zone of impact to the core zone was 1.3 km to the north. As part of the update, the percentage of visual impact to the buffer zone of the Makapan WHS has increased to 22.55% with the closest zone of impact to the core zone 300 m to the north (See Plan 3 below). This assessment is based on the theoretical viewshed model which indicates the areas from which the Project will potentially be visible. The theoretical viewshed model was refined to a practical viewshed model with a buffer of 10 km around the proposed infrastructure area. Due to the nature of the receiving environment it is unlikely that the proposed infrastructure will be noticeable beyond this 10 km buffer. Only 27.87 ha of the buffer zone of the Makapan WHS site falls within this practical viewshed area.

While the level of impact has increased and the distance to the zone of impact has reduced, the intensity of the impact has not increased significantly. The buffer zone is already impacted on by the N1 and the town of Mokopane, while the core zone is not visually impacted. Should the boundaries of the core zone of the WHS increase, this could result in an impact, and this would need to be reassessed.

[4] This section of the addendum to the specialist HIA only presents a brief summary of the visual assessment in relation to the Makapans WHS. For detailed descriptions, methodologies and analysis, refer to the addendum to the VIA for the Platreef Project.



Plan 3: Theoretical Viewshed in relation to the Makapan WHS

7 Impact Assessment

7.1 Methodology

7.1.1 Evaluation of Significance

The significance rating process is designed to provide a numerical rating of the cultural significance[5] of identified heritage resources. The evaluation was done as objectively as possible through a matrix developed by Digby Wells for this purpose. In addition, the methodology aims to allow ratings to be reproduced independently should it be required, provided that the same information sources are used.

Dimension		Attributes considered	NHRA Ref.
Aesthetic & technical	1	Importance in aesthetic characteristics	S.3(3)(e)
	2	Degree of technical / creative skill at a particular period	S.3(3)(f)
Historical importance & associations	3	Importance to community or pattern in country's history	S.3(3)(a)
	4	Site of significance relating to history of slavery	S.3(3)(i)
	5	Association with life or work of a person, group or organisation of importance in the history of the country	S.3(3)(h)
Information potential	6	Possession of uncommon, rare or endangered natural or cultural heritage aspects	S.3(3)(b)
	7	Information potential	S.3(3)(c)
	8	Importance in demonstrating principle characteristics	S.3(3)(d)
Social	9	Association to community or cultural group for social, cultural or spiritual reasons	S.3(3)(g)

Box 1: NHRA Section 3(3) criteria

This matrix takes into account heritage resources assessment criteria set out in Section 3(3) of the NHRA (see Box 1), which determines the intrinsic, comparative and contextual significance of identified heritage resources. A resource's importance rating is based on information obtained through review of available credible sources and representivity or uniqueness (i.e. known examples of similar resources to exist). The final significance attributed to a resource furthermore takes into account the physical integrity of the fabric of the resource. The formula used to determine significance is summarised in Box 2.

Value = Importance x Integrity

where

Importance = average sum

of

Aesthetic + Historic + Scientific + Social

Box 2: Cultural Significance formula

The rationale behind the heritage value matrix takes into account the fact that a heritage resource's value is a direct indication of its sensitivity to change (impacts). Value therefore needs to be determined prior to the completion of any assessment of impacts. This matrix rates the potential, or importance, of an identified resource relative to its contribution to certain values – aesthetic, historical, scientific and social.

[5] Cultural significance is defined in the NHRA as the intrinsic "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" of a heritage resource. These attributes are combined and reduced to four themes used in the Digby Wells significance matrix: aesthetic, historical, scientific and social.

The significance of a resource is directly related to the impact on it that could result from project-related activities, as it provides minimum accepted levels of change to the resource. SAHRA has published minimum standards that include minimum required mitigation of heritage resources. These minimum requirements are integrated into the matrix to guide both assessments of impacts and recommendations for mitigation and management of resources.

The weight assigned to the various parameters for significance in the formula, significance ratings and recommended mitigation are presented in Table 7-1.

7.1.2 Field Ratings

Although grading of heritage resources remains the responsibility of heritage resources authorities, SAHRA requires in terms of its Minimum Standards that heritage reports include Field Ratings for identified resources to comply with section 38 of the NHRA. The NHRA in terms of section 7 provides for a system of grading of heritage resources that form part of the national estate, distinguishing between three categories.

Field Rating = average sum

of

Aesthetic + Historic + Scientific + Social

Box 3: Field rating formula

The field rating process is designed to provide a numerical rating of the recommended grading of identified heritage resources. The evaluation was done as objectively as possible by integrating the field rating into the significance matrix. Field ratings guide decision-making in terms of appropriate minimum required mitigation measures and consequent management responsibilities in accordance with section 8 of the NHRA. The formula used to determine field ratings is summarised in Box 3. The weight assigned to the various field rating parameters in the formula and the sum of the average ratings are presented in Table 7-1.

Table 7-1: Ratings and Descriptions used in Determining CS and Field Ratings

Rating	IMPORTANCE *A heritage resource's contribution to aesthetic, historic, scientific and social value.*	INTEGRITY *The undivided or unbroken state, material wholeness, completeness or entirety of a resource or site*	FIELD RATING *Recommended grading of identified heritage resources in terms of NHRA Section 7*
-	Not assessed - dimension and/or attribute not considered in determining value.		Not assessed - dimension and/or attribute not considered in field rating.
0	The resource exhibits attributes that may be considered in a particular dimension, but it is so poorly represented that it cannot or does not contribute to the resource's overall value.	No information potential, complete loss of meaning, Fabric completely degraded, original setting lost	
1	Common, well represented throughout diverse cultural landscapes	Fabric poorly preserved, limited information, little meaning ascribed, extensive encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Negligible significance
2	Generally well represented but exhibits superior qualities in comparison to other similar examples	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance
3	The resource exhibits attributes that are rare and uncommon within a region. It is important to specific communities.	Fabric well preserved, good quality information and meaning evident, limited encroachment	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance
4	Rare and uncommon, value of national importance	Excellent preservation of fabric, high information potential of high quality, meaning is well established, no encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with High significance
5	The resource exhibits attributes that are considered singular, unique and/or irreplaceable to the degree that its significance can be universally accepted.		Resources under general protection in terms of NHRA sections 34 to 37 with Very High significance
6			Heritage resources under formal protection that can be considered to have special qualities which make them significant within the context of a province or a region
7			Heritage resources under formal protection that can be considered to have special qualities which make them significant within a national and / or international context.

7.1.3 Impact Assessment

The potential impacts were considered through an examination of the project phase and activity, the environmental aspect, the interdependencies between aspects, an assessment and classification of categories, and consideration of the potential impact on heritage resources.

7.1.3.1 Defining Heritage Impacts

Different heritage impacts may manifest in different geographical areas and diverse communities. For instance, heritage impacts can simultaneously affect the physical resource and have social repercussions: this is compounded when the intensity of physical impacts and social repercussions differ significantly. In addition, heritage impacts can influence the cultural significance of heritage resources without any actual physical impact on the resources taking place. Heritage impacts can therefore generally be placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary heritage impacts** affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct or primary impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking.
- **Indirect, induced or secondary heritage impacts** can occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its cultural significance that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any primary impact, its significance is affected that can ultimately result in the loss of the resource itself.
- **Cumulative heritage impacts** result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
  - **Additive**: the simple sum of all the effects, e.g. the total number of development activities that will occur within the study area.
  - **Synergistic**: effects interact to produce a total effect greater than the sum of the individual effects, e.g. the effect of each different activity on the archaeological landscape in the study area.
  - **Time crowding**: frequent, repetitive impacts on a particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building high.
  - **Neutralizing**: where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes in land use could reduce the overall impact on sites within the archaeological landscape of the study area.

- **Space crowding**: high spatial density of impacts on a heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

The relevance of the above distinction to defining the study areas arises from the fact that heritage resources do not exist in isolation to the wider natural, social, cultural and heritage landscape: cultural significance is therefore also linked to rarity / uniqueness, physical integrity and importance to diverse communities.

In addition, the NHRA requires that heritage resources are graded in terms of national, provincial and local concern based on their importance and consequent official (i.e. State) management effort required. The type and level of baseline information required to adequately predict heritage impacts varies between these categories. Three 'concentric' study areas were defined for the purposes of this study.

7.1.3.2 Impact assessment

The impact rating process is designed to provide a numerical rating of the identified heritage impacts. The significance rating follows an established impact/risk assessment formula is shown in Box 4. The weight assigned to the various parameters for positive and negative impacts in the formula is presented in Table 7-3 below.

Project-related impacts on heritage resources have taken into account the inherent value of heritage resources, described above, and only applied to resources with values above negligible. As a result, the impact assessment did not consider individual resources, but was applied to diverse resources grouped in terms of similar values.

The magnitude will then be applied to pre- and post-mitigation scenarios with the intention of removing all impacts on heritage resources. Where project related mitigation does not avoid or sufficiently reduce negative changes/impacts on heritage resources with high values, mitigation of these resources may be required. This may include alteration, restoration or demolition of structures under a permit issued by the relevant Heritage Resources Authorities (HRAs).

Significance = consequence of an event x probability of the event occurring

where:

Consequence = type of impact x (Intensity + Spatial Scale + Duration)

and

Probability = Likelihood of an impact occurring

In the formula for calculating consequence:

Type of impact = +1 (positive**) or -1 (**negative**)**

Box 4: Impact assessment formula

Impacts were rated prior to mitigation and again after consideration of the proposed mitigation measures. Impacts were then categories into one of eight categories listed in Table 7-3. The relationship between the consequence, probability and significance ratings is also graphically depicted in Table 7-3.

Table 7-2: Description of duration, extent, intensity and probability ratings used in impact assessment

Value	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	Probability	**Description**	**Exposure**	**Description**	**Intensity**	**Description**	**Probability**	**Description**
7	**Permanent**	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)	**International**	Impacts on heritage resources will have international repercussions, issues or effects, i.e. in context of international cultural significance, legislation, associations, etc.	**Extremely high**	Major change to Heritage Resource with High-Very High Value	**Certain/Definite**	Happens frequently. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	**Beyond Project Life**	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)	**National**	Impacts on heritage resources will have national repercussions, issues or effects, i.e. in context of national cultural significance, legislation, associations, etc.	**Very high**	Moderate change to Heritage Resource with High-Very High Value	**High probability**	Happens often. It is most likely that the impact will occur.
5	**Project Life**	The impact will cease after project life.	**Region**	Impacts on heritage resources will have provincial repercussions, issues or effects, i.e. in context of provincial cultural significance, legislation, associations, etc.	**High**	Minor change to Heritage Resource with High-Very High Value	**Likely**	Could easily happen. The impact may occur.
4	**Long Term**	Impact will remain for >50% - Project Life	**Municipal area**	Impacts on heritage resources will have regional repercussions, issues or effects, i.e. in context of the regional study area.	**Moderately high**	Major change to Heritage Resource with Medium-Medium High Value	**Probable**	Could happen. Has occurred here or elsewhere
3	**Medium Term**	Impact will remain for >10% - 50% of Project Life	**Local**	Impacts on heritage resources will have local repercussions, issues or effects, i.e. in context of the local study area.	**Moderate**	Moderate change to Heritage Resource with Medium - Medium High Value	**Unlikely / Low probability**	Has not happened yet, but could happen once in a lifetime of the project. There is a possibility that the impact will occur.

Value	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	Probability	**Description**	**Exposure**	**Description**	**Intensity**	**Description**	**Probability**	**Description**
2	**Short Term**	Impact will remain for <10% of Project Life	**Limited**	Impacts on heritage resources will have site specific repercussions, issues or effects, i.e. in context of the site specific study area.	**Low**	Minor change to Heritage Resource with Medium - Medium High Value	**Rare / Improbable**	Conceivable, but only in extreme circumstances. Have not happened during the lifetime of the project, but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	**Transient**	Impact may be sporadic/limited duration and can occur at any time. E.g. Only during specific times of operation, and not affecting heritage value.	**Very Limited**	Impacts on heritage resources will be limited to the identified resource and its immediate surroundings, i.e. in context of the specific heritage site.	**Very low**	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value	**Highly Unlikely /None**	Expected never to happen. Impact will not occur.

Table 7-3: Impact significance ratings, categories and relationship between consequence, probability and significance

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the heritage resources.	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the heritage resources.	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the heritage resources.	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the heritage resources.	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the heritage resources.	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the heritage resources and result in severe effects.	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects.	Major (negative)

Relationship between consequence, probability and significance ratings

Probability \ Significance	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	-21	**-20**	**-19**	**-18**	**-17**	**-16**	**-15**	**-14**	**-13**	**-12**	**-11**	**-10**	**-9**	**-8**	**-7**	**-6**	**-5**	**-4**	**-3**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**

Consequence

7.1.4 Mitigation Measures and Recommendations

The desired outcome of an impact assessment is the removal of negative impacts on heritage resources through the implementation of feasible mitigation measures. The mitigation and management measures recommended in this section comply with the General Principles set out under Section 5 of the NHRA. The recommendations further considered the cultural significance of heritage resources and the recommended minimum level of mitigation as published in the South African Heritage Resources Agency (SAHRA) Minimum Standards[6] (See Box 5).

Designation	Recommended mitigation
Negligible	Sufficiently recorded, no mitigation required
Low	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
Medium	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. STPs.
Medium High	Project design should aim to reduce or remove changes; Mitigation of resource to include extensive sampling and recording, e.g. test excavation, analyses, etc.
High	Project design must aim to avoid change to resource; Partly conserved, Conservation Management Plan (CMP)
Very High	Project design must change to avoid all change to resource; Conserved in entirety, CMP

Box 5: Recommended minimum level of required mitigation

Recommended mitigation is therefore divided into two categories: *project related* and *mitigation of heritage resources* defined below.

- Project-related mitigation requires changes or amendments to project design, planning and siting of infrastructure to avoid or reduce physical impacts on heritage resources. Project-related mitigation measures are always the preferred option, especially where heritage resources with higher cultural significance will be impacted on. Project-related mitigation may include:
  - *In situ* preservation (i.e. no-development) of heritage resources for which CMPs are required; and
  - Conservation of heritage resources through, for example, incorporating the resources into project design and planning, for which CMPs are also required.
- Mitigation of heritage resources may be necessary where project-related mitigation will not sufficiently conserve or preserve heritage resources, thus resulting in partial or complete changes (including destruction) to a resource. Such resources need to be mitigated to ensure that they are fully recorded, documented and researched before any negative change occurs. This may require mitigation such as:
  - Intensive detailed recording of sites through various non-intrusive techniques to create a documentary record of the site – “preservation by record”;

[6] It must be noted that these minimum standards serve as a guide, and the recommendations provided in this addendum are project specific.

- Intrusive recording and sampling such as shovel test pits (STPs) and excavations, relocation (usually burial grounds and graves, but certain types of sites may be relocated), restoration and alteration. Any form of intrusive mitigation is a regulated permitted activity for which permits need to be issued by the relevant heritage authorities. Such mitigation may result in a reassessment of the value of a resource that could require conservation measures to be implemented. Alternatively, an application for a destruction permit may be made if the resource has been sufficiently sampled; and
- Where resources have negligible significance the specialist may recommend that no further mitigation is required and the site may be destroyed, for which a destruction permit must be applied for.

Appropriate mitigation measures were identified for each impact, and the procedure discussed above was to assess the possible consequence, probability and significance of each impact post-mitigation.

The post-mitigation rating provided an indication of the significance of residual impacts, while the difference between an impact's pre- and post-mitigation ratings represents the degree to which the recommended mitigation measures are expected to be effective in reducing or ameliorating that impact.

7.2 Cultural Significance Assessment

The assessment of CS considers criteria defined in Box 1. The CS assigned to the identified heritage resources is summarised in Table 7-4. The assessment of CS indicated that the identified heritage resources designations range from negligible to very high significance.

Table 7-4: Summary of CS assessment of identified heritage resources

Resource ID	Type	CS	CS Motivation	Field Rating	Field Rating Motivation
BGG-001	Burial / grave	Very High	Burial grounds and graves are considered against social criteria where the significance of this resource is universally accepted. The meaning of burial grounds and graves is well established resulting in excellent preservation of fabric.	General Protection IV A	Burial grounds and graves are generally protected under Section 36 of the NHRA
BGG-002					
BGG-003					
BGG-004					
BGG-006					
BGG-007					
St-005	Site	Negligible	The site has attributes that can be considered on historic, scientific and social criteria. This type of site is common and well represented throughout diverse cultural landscapes. It may, however, have some importance to specific communities within the region, but the integrity of the site is low, and encroachment on the setting has made the information potential and quality questionable.	General Protection IV C	Archaeological sites are generally protected under section 35 of the NHRA

7.3 Impact Assessment Rating

The HIA completed for the Platreef Project, and the findings presented therein still have relevance and must be considered. This section of the addendum to the specialist HIA for the Platreef Project (Higgitt, 2013), in relation to the project description presented under Section 1.2 above, considers specifically the potential impacts to identified heritage resources by activities associated with the re-routing of the TSF pipeline, and the inclusion of the storm water drain not previously assessed.

7.3.1 Impacts to Burial Grounds and Graves

7.3.1.1 Impact Description

Heritage impacts on burial grounds and graves located within or in proximity to the proposed linear infrastructure will manifest as either changes to the physical integrity of the sites due to certain activities, or changes to the intangible nature of the burial grounds from restricted and / or loss of access.

Physical changes to burial grounds and graves will occur as a result of activities associated with the construction phase of the Project. The construction activities may include site clearance, topsoil removal and construction of the linear infrastructure. Intangible changes will occur as a result of the inherent access restrictions that will apply to the mining area in general. Restricted or loss of access impacts on the ability of descendants and family members, or other persons or communities who by tradition are concerned with graves, to express their living heritage as it may pertain to graves and associated ancestral rites.

Both physical and intangible impacts may result in unplanned events such as the degradation of the intrinsic cultural significance of gravesites, as well as social repercussions. In addition, there are inherent health and safety risks associated with access to operating mine properties by visitors.

7.3.1.2 Management Objectives

All identified burial grounds and graves within close proximity or within the development footprint of the linear infrastructure must, at a minimum:

- Adhere to the management procedures detailed under Section 8.3.4: Cemeteries and Graves of the Platreef Project CMP (2016); and
- Be subject to a burial grounds consultation and relocation process. The current BGGC process being undertaken could be extended to include the new burial sites.

The consultation process must be completed in accordance with Chapter XI of the NHRA Regulations (GN R 548) and aim to:

- Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves;
- Consult with identified stakeholders regarding the effect of the Project on graves; and
- Reach agreement with stakeholders on the future of identified graves, to retain sites *in situ* or exhume, relocate and reinter the contents of graves.

7.3.1.3 Management Actions and Targets

Where burial grounds and graves are located in areas where *in situ* preservation is possible, for example on the proposed linear infrastructure boundaries, mitigation must consider redesigning proposed routing options to exclude burial grounds from the development footprints. Consultation with stakeholders will, however, will still be required to reach agreement on the *in situ* conservation, including access requirements. The following minimum buffer zones are recommended for gravesites that may be conserved *in situ*:

- At least 15 m from any linear infrastructure footprints such as pipelines, roads or conveyors, including servitudes;
- At least 25 m from other infrastructure footprints such as offices, parking areas, etc.; and
- At least 100 m from open pit areas.

It is recommended that Chance Find Protocols (CFPs) be developed and included in the Environmental Management Plan (EMP) as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds identified and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.

Where burial grounds and graves are located in areas where *in situ* conservation will not be feasible or will be unsafe, mitigation must consider the exhumation and relocation of graves within the current process being undertaken. Exhumation and relocation is a permitted activity in accordance with Section 36(3) of the NHRA, and regulated by Chapters IX and XI of the NHRA: Regulations.

7.3.1.4 Impact Ratings on Burial Grounds and Graves

The assessment of the impacts as described under Section 7.3.1 above and the ratings assigned are summarised in Table 7-5 and Table 7-6.

Table 7-5: Physical impacts to burial grounds and graves

IMPACT DESCRIPTION: Physical impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Permanent (7)	Destruction of burial grounds and graves through construction activities will be permanent	Consequence: Extremely detrimental (-20)	Significance: Major - negative (-140)
Extent	National (6)	Unmitigated alteration to the status quo of known burials will have repercussions to Next-of-Kin (NoK) and the reputation of Ivanplats. In addition, unmitigated changes to burials will result in the involvement of local, provincial and national authorities, as well as potentially national media attention		
Intensity x type of impact	Extremely high - negative (-7)	This will be a major change to a resource with very high significance		
Probability	Certain (7)	Without mitigation, the identified impact is certain to occur		
MITIGATION				
The newly identified burial grounds and graves must be subject to a burial grounds consultation and relocation process. The current consultation and relocation process could be extended to include these graves. The consultation process is regulated by Chapter XI of the NHRA regulations that aim to: ▪ Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves; ▪ Consult with identified stakeholders regarding the effect of the Project on graves; and ▪ Reach agreement with stakeholders on the future of identified graves, to retain sites in situ or exhume, relocate and reinter the contents of the graves. Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.			

IMPACT DESCRIPTION: Physical impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
POST-MITIGATION				
Duration	Beyond project life (6)	The impact will extend beyond the project life, specifically if graves are relocated	Consequence: Moderately detrimental (-13)	Significance: Moderate - negative (-78)
Extent	Limited (2)	The extent of the impact will be limited to specific burial grounds and identified NoK		
Intensity x type of impact	High - negative (-5)	The mitigation will result in a minor change to a heritage resource with very high significance. Grave relocation is inherently negative, as the physical and social contexts of graves are destroyed through the act of exhumation and relocation. In terms of in situ conservation, loss or restricted access will still negatively affect the graves and persons associated.		
Probability	Highly probable (6)	It is probable that mitigation measures will reduce the consequence of the identified impact.		

Table 7-6: Summary of intangible impacts to burial grounds and graves

IMPACT DESCRIPTION: Intangible impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Project Life (5)	Intangible impacts to burial grounds will occur throughout the life of the Project	Consequence: Highly detrimental (-16)	Significance: Moderate - negative (-80)

<table>
<tr><th colspan="5">IMPACT DESCRIPTION: Intangible impacts to burial grounds and graves</th></tr>
<tr><td>Predicted for project phase:</td><td>Pre-construction</td><td>Construction</td><td>Operation</td><td>Decommissioning</td></tr>
<tr><td>Dimension</td><td>Rating</td><td colspan="3">Motivation</td></tr>
<tr><td>Extent</td><td>National (6)</td><td>Social repercussions resulting from unmitigated changes to graves could affect at the very least descendant communities residing in the region. In addition, unmitigated changes to graves will result in the involvement of local, provincial and national authorities, as well as potentially national media attention.</td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>Intensity x type of impact</td><td>High - negative (-5)</td><td>The intensity of the intangible impacts will result in a moderate change to burial grounds and graves</td></tr>
<tr><td>Probability</td><td>Likely (5)</td><td colspan="2">if unmitigated, it is likely that identified intangible impacts will manifest</td></tr>
<tr><td colspan="5">MITIGATION</td></tr>
<tr><td colspan="5">Where in situ preservation is possible, redesign of development footprints to exclude graves from the development footprint must be considered. A buffer of at least 15m from any linear infrastructure footprints must be maintained. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.
Consultation, as part of the current process being undertaken, will still be required to reach agreement on the in situ conservation, including access requirements.
The results of the consultation and any agreements reached must be encapsulated in the CMP currently being compiled.</td></tr>
<tr><td colspan="5">POST-MITIGATION</td></tr>
<tr><td>Duration</td><td>Project Life (5)</td><td>As for pre-mitigation</td><td rowspan="2">Consequence: Highly beneficial (15)</td><td rowspan="2">Significance: Moderate - positive (75)</td></tr>
<tr><td>Extent</td><td>Municipal Area (4)</td><td>Agreements must involve at the very least the local municipality.</td></tr>
</table>

IMPACT DESCRIPTION: Intangible impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
Intensity x type of impact	Very high - positive (6)	Loss of or restricted access to in situ burial grounds will still negatively affect associated NoK. However, through the development and implementation of the CMP in consultation with the NoK and communities, the intrinsic CS of burial sites can be preserved through the expressions of living heritage		
Probability	Likely (5)	Mitigation will ensure that grave sites are conserved in situ according to the requirements of affected communities, and within legal requirements. This will ensure that the CS of gravesites is enhanced through sustainable use by affected communities.		

8 Unplanned Events and Low Risks

Risk is defined as the potential consequence(s) of an interaction combined with its likelihood. Should a risk eventuate, it will manifest as an impact. These concepts are often misconstrued and lead to disproportionate amounts of effort spent on assessing minor risks with potentially insignificant impacts, at the cost of overlooking more important ones. The identification of project risks should take place during the scoping phase of the ESIA. This allows for input from stakeholders prior to commencement of the impact assessment phase.

Broad mitigation and monitoring measures were provided for low risks and unplanned events which **were not assessed in detail** (i.e., with significance ratings). In general monitoring is an accepted form of mitigation for low risks.

Certain project activities may represent low risks to heritage resources or cause unplanned events. Low risks, where identified, can be monitored to gauge if the baseline changes and mitigation is required. Unplanned events are events that can occur on any project and cannot be monitored, but can, however, be planned for to reduce the severity of potential impacts if and where they occur.

Information on the potential impacts of these events and management plans are provided in this section. These are summarised in Table 8-1.

Table 8-1: Summary of potential unplanned events, potential impacts, and proposed mitigation and management

Unplanned event	Potential impact	Mitigation / Management / Monitoring
Accidental exposure of *in situ* MSA and LSA accumulations during the construction of the Project	Damage or destruction of heritage resources generally protected under section 35 of the NHRA	Project specific Chance Find Protocols (CFPs) must be developed and included in the Environmental Management Plan (EMP) as a condition of authorisation. The CFPs must clearly describe the type of heritage resources that may occur within the site specific project area, the protocol to follow in the event of accidental exposure of previously unidentified heritage resources, and the appropriate management measures and reporting structures to be adhered to. The CFPs must be defined and established prior to the pre-construction phase of the proposed infrastructure.
Accidental exposure of *in situ* LFC settlement sites during the construction phase of the Project		
Accidental exposure of human remains during the construction phase of the Project	Damage or destruction of heritage resources generally protected under section 36 of the NHRA	
Restricted and / or loss of access to burial grounds and graves	Degradation of the intrinsic cultural significance of burial grounds and graves	Include all identified burial grounds and graves within the current consultation process to identify Next-of-Kin, consult with stakeholders and reach agreement on the future of the identified graves.
Spillage from a burst slurry pipeline	Damage to heritage resources generally protected under section 35 and 36 of the NHRA	Identified heritage resources within proximity to the TSF pipeline must be included within the CMP. The CMP should stipulate monitoring procedures to gauge levels of change and determine if mitigation is required to reduce negative impacts.

9 Environmental Management Programme

An EMPr is a delivery mechanism for the measures identified in Section 7.2 and ensures a systematic approach to bringing environmental and social considerations into decision making and day-to-day operations. It establishes a framework for tracking, evaluating and communicating environmental and social performance and helps ensure that environmental risks and liabilities are identified, minimized and managed. This EMPr details the additional mitigation measures Ivanplats will implement throughout the project lifecycle.

The EMPr has been developed to meet national environmental requirements, in particular the provisions of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). Ivanplats will, therefore, need to commit to preventing pollution and making resources available to ensure that all reasonable safeguards are in place to do so. In addition, Ivanplats will need to accept accountability and financial liability for any pollution that may occur as a result of project activities.

The EMPr will be a living document, and will continue to develop during the design and construction phase to enable continuous improvement of the project's social and environmental performance. The EMPr will also be reviewed against changes in the regulatory regime and in the event of new policies or guidelines from the relevant Competent Authorities. Periodic reviews and updating will also be carried out throughout the project lifecycle, to incorporate changes in activities and any changes in the overarching management systems.

The ultimate goal of the EMPr is to:

- Incorporate environmental management into project design and operating procedures;
- Serve as an action plan for environmental management for the Project and provide a framework for implementing project environmental commitments (i.e. mitigation measures identified in the EIA);
- Ensure that all workers, subcontractors and others involved in the Project meet legal and other requirements with regard to environmental management;
- Address concerns and issues raised in the EIA's stakeholder consultation process and those that will likely continue to arise during the Project's lifetime; and
- Prepare and maintain records of project environmental performance (i.e. monitoring, audits and non-compliance tracking).

9.1 Project activities with potentially significant impacts

A summary of potentially significant impacts to heritage resources in reference to project activities is summarised in Table 9-1. These impacts are associated with identified burial grounds and graves that may be affected by the re-routing of a section of the TSF pipeline and the new storm water drain option.

Table 9-1: Potentially significant impacts of the proposed infrastructure

Aspects	Potential Significant Impacts	Comment
TSF Pipeline	Physical alteration to burial grounds and graves	The proposed re-routing of a section of the TSF pipeline may result in the damage and / or destruction of burial grounds and graves generally protected under section 36 of the NHRA
Storm water drain	Intangible impacts to burial grounds and graves	Linear infrastructure may result in restricted and / or the loss of access to burial grounds of family members or other persons or communities who by tradition are concerned with graves to express their living heritage as it may pertain to graves and ancestral rites.

9.2 Summary of Mitigation and Management

Table 9-2 to Table 9-5 provides a summary of the proposed project activities, environmental aspects and impacts on the receiving environment. Information on the frequency of mitigation, relevant legal requirements, recommended management plans, timing of implementation, and roles / responsibilities of persons implementing the EMPr.

Table 9-2: Project Activities Requiring Management

Activities	Phase	Size and Scale of Disturbance	Potential Impact	Mitigation Measures	Compliance with Standards	Time Period for Implementation
TSF pipeline and Storm water drain	Construction	4.84 km – TSF pipeline 3.02 km – Storm water drain	Physical alteration to burial grounds and graves Intangible impacts to burial grounds and graves	Burial grounds and graves must be subject to a consultation and relocation process, and could form part of the existing process being undertaken. Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources. Where burial grounds and graves are located in areas where in situ conservation will not be feasible or unsafe, mitigation must consider the exhumation and relocation of graves within the current process being undertaken.	Burial grounds and graves are protected under section 36 of the NHRA. The consultation process is regulated by Chapter XI of the Regulations to the NHRA. The relocation process is regulated by Chapter IX and XI of the Regulations to the NHRA	Prior to the construction phase

Table 9-3: Potential Impacts and Outcomes of the EMPr

Activities	Potential Impacts	Phase	Mitigation	Standard to be Achieved/Objective
TSF pipeline and Storm water drain	Physical alteration to burial grounds and graves	Construction	Modify through amendment to the design as far as is feasible to preserve burial grounds and graves *in situ,* and include in the current consultation process to establish in conjunction with identified bona fide NoK, a management measures for the identified burial grounds and graves for inclusion in the CMP. Where project alternatives are not feasible, the potential impact to burial grounds and graves must be remedied through the implementation relocation process supported through the consultation and relevant permits.	Compliance with the section 36 of the NHRA and Chapter XI of the Regulations to the Act (GNR 548).

Table 9-4: Proposed Mitigation and Management Measures

Activities	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
TSF pipeline and Storm water drain	Physical alteration to burial grounds and graves	Heritage and Social (Burial grounds and graves)	Modify through amendment to the design as far as is feasible to preserve burial grounds and graves *in situ,* and include in the current consultation process to establish in conjunction with identified bona fide NoK, a management measures for the identified burial grounds and graves for inclusion in the CMP. Where project alternatives are not feasible, the potential impact to burial grounds and graves must be remedied through the implementation relocation process supported through the consultation and relevant permit approvals.	Prior to the construction phase	Burial grounds and graves are protected under section 36 of the NHRA. The consultation process is regulated by Chapter XI of the Regulations to the NHRA. The relocation process is regulated by Chapter IX and XI of the Regulations to the NHRA

Table 9-5: Prescribed Environmental Management Standards, Practice, Guideline, Policy or Law

Applicable Standard, Practice, Guideline, Policy or Law		
Title	**Description of Requirements**	**Relevance to Project**
Legislation (National, Provincial, Local)		
The National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Heritage resources within the Project development footprint are protected under section 35 and 36 of the NHRA, and may not be impacted upon without the approval and necessary permits issued by SAHRA	Archaeological sites within the development footprint will undergo Phase 2 mitigations. Burial grounds and graves are currently under assessment through a consultation and relocation process. A CMP which considers the requirements of the NHRA has been developed for the Project.
Regulations to the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (GN R 548)	Provisions for permit applications are regulated under Chapter II of GN R 548. Furthermore, applications for heritage resources protected under sections 35 and 36 of the NHRA are regulated by Chapters IV and IX respectively. For burial grounds and graves specifically, consideration must also be given to Chapters XI and XII for procedures of consultation and the identification of previously unknown graves.	Permitted activities, including mitigation of archaeological sites and current burial grounds consultation and relocation process are permitted activities regulated by GN R 548. These activities must be cognisant of and adhere to the regulations to ensure compliance with the legislative framework.
Mogalakwena Local Municipality Cemetery By-laws, 2007	Municipal by-laws governing the exhumation of bodies are stipulated under sections 53, 57 – 63.	Municipal requirements must be considered as part of the current burial grounds consultation and relocation process as relevant.
Applicable Guideline/Standards		
SAHRA guidelines for the development of plans for the management of heritage sites or places.	Guidelines applicable to the development of a management plan of heritage sites or places, that defines: ▪ What needs to be done; ▪ How it will be done; ▪ Who is responsible for the implementation; ▪ How it will be funded; and ▪ When activities or actions will be done.	A CMP which considered the guidelines during the development of the plan has been developed for the Project.

10 Monitoring Programme

The monitoring programme must adhere to the framework outlined in the Platreef Project CMP, as stipulated under Section 8.2: Heritage Management Framework. Additionally, it is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.

11 Relevant Stakeholder Consultation

No stakeholder engagement was undertaken as part of the addendum to the specialist HIA for the Platreef Project (Higgitt, 2013).

12 Relevant Comments and Responses

This addendum to the specialist HIA represents the un-consulted version for public consumption. Once the report has been submitted for public review, and comments received, the comments and responses will be included within this section.

13 Conclusion and Recommendation

The addendum to the specialist HIA for the Platreef Project (Higgitt, 2013) considered changes to the amendment of the approved mine layout plan to accommodate the encroachment of communities within the Project boundary. The amendment has resulted in the reduction of the overall footprint of the Project, which will not exclude heritage resources that may have previously been impacted upon. No new impacts on heritage resources have been identified by the proposed reduction of the footprint area, and the recommendations provided in the specialist HIA for the Platreef Project remain relevant.

In addition to the reduction of the development footprint, this report considers the inclusion of new linear infrastructure into the amended mine layout plan, specifically the re-routing of a 4.84 km section of the TSF pipeline and the addition of a 3.02 km storm water drain. Identified heritage resources and potential impacts from project related activities are discussed with specific reference to these two infrastructures only.

A total of seven heritage resources were identified during a pre-disturbance survey of the development footprint of the TSF pipeline and storm water drain. These included six burial grounds and graves, and one LFC site. The LFC site (St-005) was assigned a negligible CS and deemed to have been sufficiently recorded. This site was not considered further in this addendum. Heritage impacts to the identified burial grounds and graves were identified and assessed in relation to the re-routing of a section of the TSF pipeline and the addition of a storm water drain. Heritage impacts may manifest as either changes to the physical integrity of the sites due to certain activities, or changes to the intangible nature of the burial grounds from restricted and / or loss of access.

It is recommended all identified burial grounds and graves within proximity or within the development footprint of the linear infrastructure be subject to a burial grounds consultation process. The current burial grounds consultation and relocation process could be extended o achieve this. The consultation process must be completed in accordance with Chapter XI of the NHRA Regulations (GN R 548) and aim to:

- Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves;
- Consult with identified stakeholders regarding the effect of the Project on graves; and
- Reach agreement with stakeholders on the future of identified graves, to retain sites *in situ* or exhume, relocate and reinter the contents of graves.

Where burial grounds and graves are located in areas where *in situ* preservation is possible, for example on the proposed linear infrastructure boundaries, mitigation must consider redesigning proposed routing options to exclude burial grounds from the development footprints. Consultation with stakeholders will, however, still be required to reach agreement on the *in situ* conservation, including access requirements. The following minimum buffer zones are recommended for gravesites that may be conserved *in situ*:

- At least 15 m from any linear infrastructure footprints such as pipelines, roads or conveyors, including servitudes;
- At least 25 m from other infrastructure footprints such as offices, parking areas, etc.; and
- At least 100 m from open pit areas.

It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.

Where burial grounds and graves are located in areas where *in situ* conservation will not be feasible or will be unsafe, mitigation must consider the exhumation and relocation of graves within the current process being undertaken. Exhumation and relocation is a permitted activity in accordance with Section 36(3) of the NHRA, and regulated by Chapters IX and XI of the NHRA: Regulations.

14 Bibliography

Higgitt, N. (2013). *Heritage Impact Assessment for the Platreef Platinum Project on the farms Bultongfontein 886 LR, Turfsruit 241 KR, Macalacaskop 243 KR and Rietfontein 2 KS in Mokopane, Limpopo Province.* Digby Wells Environmental: Unpublished report.

Appendix A: Declaration of Independence and Specialist CV

Digby Wells and Associates (South Africa) (Pty) Ltd

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I, Justin du Piesanie as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of the addendum to the Platreef Underground Mine Environmental Impact Assessment, other than fair remuneration for work performed, specifically in connection with the proposed Project, Limpopo Province.



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Full Name	Justin du Piesanie
Title / Position	Heritage Management Consultant: Archaeologist
Qualifications	Master of Science (MSc)
Experience (Years)	10 Years
Registration	Association of Southern African Professional Archaeologists (ASAPA) International Council on Monuments and Sites (ICOMOS) South Africa

Mr. Justin du Piesanie

Heritage Management Consultant: Archaeologist

Social Sciences Department

Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2013	Continued Professional Development Programme, Architectural and Urban Conservation: Researching and Assessing Local Environments	University of Cape Town
2008	MSc	University of the Witwatersrand
2005	BA (Honours) (Archaeology)	University of the Witwatersrand
2004	BA	University of the Witwatersrand
2001	Matric	Norkem Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

3 Employment

Period	Company	Title/position
08/2011 to present	Digby Wells Environmental	Heritage Management Consultant: Archaeologist

Period	Company	Title/position
2009-2011	University of the Witwatersrand	Archaeology Collections Manager
2009-2011	Independent	Archaeologist
2006-2007	Maropeng & Sterkfontein Caves UNESCO World Heritage Site	Tour guide

4 Professional Affiliations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	270
Member	International Council on Monuments and Sites (ICOMOS)	14274
Member	Society for Africanist Archaeologists (SAfA)	N/A

5 Publications

- Huffman, T.N. & du Piesanie, J.J. 2011. Khami and the Venda in the Mapungubwe Landscape. Journal of African Archaeology 9(2): 189-206

6 Experience

I have 5 years experiences in the field of heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. During my studies I was involved in academic research projects associated with the Stone Age, Iron Age, and Rock Art. These are summarised below:

- Wits Fieldschool - Excavation at Meyersdal, Klipriviersberg Johannesburg (Late Iron Age Settlement).
- Wits Fieldschool - Phase 1 Survey of Prentjiesberg in Ugie / Maclear area, Eastern Cape.
- Wits Fieldschool – Excavation at Kudu Kopje, Mapungubwe National Park Limpopo Province.

- Wits Fieldschool – Excavation of Weipe 508 (2229 AB 508) on farm Weipe, Limpopo Province.
- Survey at Meyerdal, Klipriviersberg Johannesburg.
- Mapping of Rock Art Engravings at Klipbak 1 & 2, Kalahari.
- Survey at Sonop Mines, Windsorton Northern Cape (Vaal Archaeological Research Unit).
- Excavation of Kudu Kopje, Mapungubwe National Park Limpopo Province.
- Excavation of KK (2229 AD 110), VK (2229 AD 109), VK2 (2229 AD 108) & Weipe 508 (2229 AB 508) (Origins of Mapungubwe Project)
- Phase 1 Survey of farms Venetia, Hamilton, Den Staat and Little Muck, Limpopo Province (Origins of Mapungubwe Project)
- Excavation of Canteen Kopje Stone Age site, Barkley West, Northern Cape
- Excavation of Khami Period site AB32 (2229 AB 32), Den Staat Farm, Limpopo Province

Since 2011 I have been actively involved in environmental management throughout Africa, focusing on heritage assessments incompliance with International Finance Corporation (IFC) Performance Standards and other World Bank Standards and Equator Principles. This exposure to environmental, and specifically heritage management has allowed me to work to international best practice standards in accordance with international conservation bodies such as UNESCO and ICOMOS. In addition, I have also been involved in the collection of quantitative data for a Relocation Action Plan (RAP) in Burkina Faso. The exposure to this aspect of environmental management has afforded me the opportunity to understand the significance of integration of various studies in the assessment of heritage resources and recommendations for feasible mitigation measures. I have work throughout South Africa, as well as Burkina Faso, the Democratic Republic of Congo, Liberia and Mali.

7 Project Experience

Please see the following table for relevant project experience:

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Klipriviersberg Archaeological Survey	Meyersdal, Gauteng, South Africa	2005 2006	Survey of residential development in Meyersdal. This included the recording of identified stone walled settlements through detailed mapping and photographs. Included was the Phase 2 Mitigation of two stone walled settlements	Archaeological Impact Assessments	Researcher, Archaeological Assistant	2 Months		Completed survey, excavations and reporting	Archaeological Resource Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Sun City Archaeological Site Mapping	Sun City, Pilanesberg, North West Province, South Africa	2006 2006	Recording of an identified Late Iron Age stonewalled settlement through detailed mapping	Mapping	Archaeological Assistant, Mapper	1 Month	Sun City	Completed mapping	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Witbank Dam Archaeological Impact Assessment	Witbank, Mpumalanga, South Africa	2007 2007	Archaeological survey for proposed residential development at the Witbank dam	Archaeological Impact Assessment	Archaeological Assistant	1 Week		Completed Archaeological Impact Assessment report	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Archaeological Assessment of Modderfontein AH Holdings	Johannesburg, Gauteng, South Africa	2008 2008	Archaeological survey and basic assessment of Modderfontein Holdings	Archaeological Impact Assessment	Archaeologist	1 Month		Completed the assessment of 13 properties	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Heritage Assessment of Rhino Mines	Thabazimbi, Limpopo Province, South Africa	2008 2008	Heritage Assessment for expansion of mining area at Rhino Mines	Heritage Impact Assessment	Archaeologist	2 Weeks	Rhino Mines	Completed the assessment	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Cronimet Project	Thabazimbi, Limpopo Province, South Africa	2008 2008	Archaeological survey of Moddergat 389 KQ, Schilpadnest 385 KQ, and Swartkop 369 KQ,	Archaeological Impact Assessment	Archaeologist	1 Weeks	Cronimet	Completed field survey and reporting	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Eskom Thohoyandou SEA Project	Limpopo Province, South Africa	2008 2008	Heritage Statement defining the cultural landscape of the Limpopo Province to assist in establishing sensitive receptors for the Eskom Thohoyadou SEA Project	Heritage Statement	Archaeologist	2 Months	Eskom	Completed Heritage Statement	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009 2009	Contracted by the Heritage Contracts Unit to help facilitate the Phase 2 excavations of a Late Iron Age / historical site identified in Shoshanguve	Excavation and Mapping	Archaeologist	1 Week	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009 2009	Mapping of a Late Iron Age rock shelter being studied by the Archaeology Department of the University of the Witwatersrand	Mapping	Archaeologist	1 Day	University of the Witwatersrand	Completed mapping of the shelter	University of the Witwatersrand Karim Sadr karim.sadr@wits.ac.za
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010 2010	Heritage Survey of the Anglo-Boer War Vaalkrans Battlefield where the servitude of the NMP pipeline	Heritage Impact Assessment	Archaeologist	1 Week	Umlando Consultants	Completed survey	Umlando Consultants Gavin Anderson umlando@gmail.com
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010 2010	Heritage survey of Witpoortjie 254 IQ, Mindale Ext 7 and Nooitgedacht 534 IQ for residential development project	Archaeological Impact Assessment	Archaeologist	1 Week	ARM	Completed survey for the AIA	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010 2010	Phase 2 archaeological excavations of Late Iron Age Site	Archaeological Excavation	Archaeologist	2 Weeks	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
De Brochen and Booysendal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010 2010	Mapping of archaeological sites 23, 26, 27, 28a & b on the Anglo Platinum Mines De Brochen and Booysendal	Mapping	Archaeologist	1 Week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010 2010	Desktop study to identify heritage sensitivity of the Limpopo Province	Desktop Study	Archaeologist	1 Month	Strategic Environmental Focus	Completed Report	Strategic Environmental Focus (SEF) Vici Napier vici@sefsa.co.za
Batlhako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Batlhako Mine Expansion Area	Mapping	Archaeologist	1 Week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Kibali Gold Project Grave Relocation Plan	Orientale Province, Democratic Republic of Congo	2011 2013	Implementation of the Grave Relocation Project for the Randgold Kibali Gold Project	Grave Relocation	Archaeologist	2 Years	Randgold Resources	Successful relocation of approximately 3000 graves	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Kibali Gold Hydro-Power Project	Orientale Province, Democratic Republic of Congo	2012 2014	Assessment of 7 proposed hydro-power stations along the Kibali River	ESIA	Heritage Consultant	2 Years	Randgold Resources	Completed Heritage Impact Assessment	Randgold Resources Charles Wells Charles.wells@randgoldreources.com
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2012	Heritage Impact Assessment on the farm Vygenhoek	EIA and EMP	Heritage Consultant	6 Months	Aquarius Resources	Completed Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012 2012	Heritage impact Assessment for the proposed TSF and Pipeline of Geluksdal Mine	EIA and EMP	Heritage Consultant	4 Months	Gold One International	Completed Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012 2012	Survey for Burial Grounds and Graves	Burial Grounds and Graves Management Plan	Heritage Consultant	4 Months	Platreef Resources	Project closed by client due to safety risks	Platreef Resources Gerick Mouton

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012 2012	Archaeological Excavation of identified sites	Archaeological Excavation	Heritage Consultant	4 Months	Resources Generation	Completed excavation and reporting, destruction permits approved	Resources Generation Louise Nicolai
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012 2012	Watching brief for construction of new road	Watching Brief	Heritage Consultant	1 Week	Bokoni Platinum Mine	Completed watching brief, reviewed report	Bokoni Platinum Mines (Pty) Ltd
SEGA Gold Mining Project	Burkina Faso	2012 2013	Socio Economic and Asset Survey	RAP	Social Consultant	3 Months	Cluff Gold PLC	Completed field survey and data collection	Cluff Gold PLC
SEGA Gold Mining Project	Burkina Faso	2013 2013	Specialist Review of Heritage Impact Assessment	Reviewer	Heritage Consultant	1 Week	Cluff Gold PLC	Reviewed specialist report and made appropriate recommendations	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013 2013	Heritage Impact Assessment for the proposed Consbrey and Harwar Collieries	EIA and EMP	Heritage Consultant	2 Months	Msobo	Completed Heritage Impact Assessments	Msobo
New Liberty Gold Project	Liberia	2013 2014	Implementation of the Grave Relocation Project for the New Liberty Gold Project	Grave Relocation	Heritage Consultant	5 Months	Aureus Mining	Grave Relocation completed	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping for the proposed Falea Uranium Mine	Environmental Assessment	Heritage Consultant	2 Months	Rockgate Capital	Completed scoping report and recommended further studies	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013 2014	Heritage impact Assessment for the proposed Putu Iron Ore Mine, road extension and railway line	EIA and EMP	Heritage Consultant	6 Months	Atkins Limited	Completed Heritage Impact Assessment and provided recommendations for further studies	Atkins Limited Irene Bopp Irene.Bopp@atkinsglobal.com

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013 2014	Notification of intent to Develop and Heritage Statement for the Sasol Twistdraai Expansion	NID	Heritage Consultant	2 Months	ERM Southern Africa	Completed NID and Heritage Statement	ERM Southern Africa Alan Cochran Alan.Cochran@erm.com
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013 2013	Project Management of the heritage study	NID	Project Manager	3 Months	ERM Southern Africa	Project completed	ERM Southern Africa Kasantha Moodley Kasantha.Moodley@erm.com
Exxaro Belfast, Paardeplaats and Eerstelingsfontein GRP	Belfast, Mpumalanga, South Africa	2013 2014	Grave Relocation Plan for the Belfast, Paardeplaats and Eerstelingsfontein Projects	GRP	Project Manager, Heritage Consultant	2 Years	Exxaro	Burial Grounds and Graves consultation complete and applications to authorities submitted for permitting	Exxaro Johan van der Bijl Johan.vanderbijl@exxaro.com
Nzoro 2 Hydro Power Project	Orientale Province, Democratic Republic of Congo	2014 2014	Social consultation for the Relocation Action Plan component of the Nzoro 2 Hydro Power Station	RAP	Social Consultant	2 Months	Randgold Resources	Completed introductory meetings – project has been placed on hold	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for the proposed new sludge storage facility and pipeline	EIA and EMP	Heritage Consultant	2 Months	AECOM	Completed HIA and submitted to the authorities	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for reclamation activities associated with the Soweto Cluster Dumps	EIA and EMP	Heritage Consultant	3 Months	ERGO	Completed HIA and submitted to the authorities	ERGO Greg Ovens greg.ovens@drdgold.com
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the Section 102 Amendment of the Klipspruit Mine EMP	EIA and EMP	Heritage Consultant	6 Months	BHP Billiton	HIA finalised and submitted to the authorities	BHP Billiton

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the expansion of the Klipspruit Mine	EIA and EMP	Heritage Consultant	6 Months	BHP Billiton	HIA finalised and submitted to authorities	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	NID and Heritage Statement for the construction of the Rondebult Pipeline	BA	Heritage Consultant	1 Week	ERGO	Completed screening assessment and NID	ERGO Greg Ovens greg.ovens@drdgold.com
Kibali ESIA Update Project	Orientale Province, Democratic Republic of Congo	2014 2014	Update of the Kibali ESIA for the inclusion of new open-cast pit areas	ESIA	Heritage Consultant	1 Month	Randgold Resources	Completed heritage assessment and input into the ESIA	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014 2014	Gap analysis for the EMP consolidation of operations west of Johannesburg	Gap Analysis	Heritage Consultant	1 Month	Gold One International	Gap analysis complete and proposed way forward submitted	Gold One International
Yzermite PIA	Wakkerstroom, Mpumalanga, South Africa	2014 2014	Palaeontological Assessment for the Yzermyne Project	PIA	Project Management	1 Month	EcoPartners	Completed report and submitted to authorities	EcoPartners San Oosthuizen san@ecopartners.co.za
Sasol Mooikraal Basic Assessment	Sasolburg, Free State, South Africa	2014 2014	Heritage Basic Assessment for the proposed Mooikraal Pipeline	HBA	Heritage Consultant	4 Months	Sasol Mining	Completed Heritage Basic Assessment and submitted to the authorities	
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2015	EIA and EMP for the Aquarius Everest North Mining Project	EIA and EMP	Project Manager	1 Year	Aquarius Resources	EIA and EMP amended and submitted to authorities. Authorisation received.	Aquarius Resources Robyn Mellett Robyn.Mellett@aquariussa.co.za
Oakleaf ESIA Project	Bronkhorstspruit, Gauteng, South Africa	2014 2015	Heritage impact Assessment for the Oakleaf Project	EIA and EMP	Heritage Consultant	4 Months	Oakleaf Investment Holdings	HIA report finalised and submitted to the authorities	

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Rea Vaya Phase II C Project	Johannesburg, Gauteng, South Africa	2014 2014	Heritage Impact Assessment on 2 structures along Rea Vaya Routing	HIA	Project Manager	1 year	Iliso Consulting	HIA report finalised and submitted to the authorities	Iliso Consulting
NTEM Iron Ore Mine and Pipeline Project	Cameroon	2014 2015	Review of Heritage Impact Assessment for the NTEM ESIA	EIA and EMP	Specialist Reviewer	1 Month	International Mining and Infrastructure Corporation plc	Specialist reports reviewed and comments provided	
Imvula Project	Kriel, Mpumalanga, South Africa	2014 2015	Heritage Scoping Report for Imvula EIA	EIA and EMP	Heritage Consultant	1 Year 4 Months	Ixia Coal	Project completed and submitted	
Sibanye WRTRP	Gauteng, South Africa	2014 2016	Heritage Impact Assessment for the Sibanye WRTRP	EIA and EMP	Heritage Consultant	On-going	Sibanye	Project is on-going	
VMIC Vanadium EIA Project	Mokopane, Limpopo, South Africa	2014 2015	Heritage Impact Assessment for the Vanadium Project	EIA and EMP	Heritage Consultant	1 Year	VM Investment Company	HIA report finalised and submitted to the authorities	
NLGM Constructed Wetlands Project	Liberia	2015 2015	Heritage Assessment for the proposed constructed wetlands	HIA	Heritage Consultant	1 Month	Aureus Mining	HIA report finalised and submitted	
ERPM Section 34 Destruction Permits Applications	Johannesburg, Gauteng, South Africa	2015 2015	Section 34 Destruction Permit Applications for the SEV and Cason Shafts	HIA and S.34 Applications	Project Manager	4 Months	Ergo Mining	Application submitted and permits received	Ergo Mining Greg Ovens greg.ovens@drdgold.com
JMEP II EIA	Botswana	2015 2015	Heritage Impact Assessment for the JMEP II Wellfields	HIA	Heritage Consultant	2 Months	Jindal	HIA completed and submitted to authorities	
Gino's Building Section 34 Destruction Permit Application	Johannesburg, Gauteng, South Africa	2015 2016	Heritage Impact Assessment and Section 34 Destruction Permit Application	HIA and S. 34 Applications	Project Manager	On-going	Bigen Africa Services (Pty) Ltd	Project is on-going	Bigen Africa Services (Pty) Ltd Kamantha Veerasamy Kamantha.Veerasamy@bigenafrica.com
EDC Block Refurbishment Project	Johannesburg, Gauteng, South Africa	2015 2016	Heritage Impact Assessment and Section 34 Permit Application	HIA and S. 34 Applications	Project Manager	On-going	Bigen Africa Services (Pty) Ltd	Project is on-going	Bigen Africa Services (Pty) Ltd Taka Sande Taka.Sande@bigenafrica.com

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Namane IPP and Transmission Line EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Impact Assessment	EIA and EMP	Heritage Consultant	On-going	Namane Resources (Pty) Ltd	Project is on-going	
Temo Coal Road Diversion and Rail Loop EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Impact Assessment	EIA and EMP	Heritage Consultant	On-going	Namane Resources (Pty) Ltd	Project is on-going	

Appendix G: Addendum Traffic Impact Assessment Report

Ivanplats Platinum Mine, Limpopo

Traffic Impact Assessment

Digby Wells Environmental

13 July 2015

Revision: 0

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Executive Summary

Aurecon has been appointed by Digby Wells (Pty) Ltd to prepare a Traffic Impact Assessment (TIA) in support of the implementation of the proposed Ivanplats Platinum Mine in Limpopo. In 2013, IMPOFU Engineers conducted a traffic impact study for the same development and this report serves as an update of that study.

The proposed mine is located along N11, about 15km north of Mokopane CBD. The site is surrounded by residential areas of Ga-Magongwa and Shamahansi to the north and east; Segkoboko and Ga-kgubudi to the west and south.

Access to the site is proposed from the N11. The access will be created by adding a fourth leg to an existing three-legged intersection

Construction and mine operations are currently taking place. Construction is scheduled to end by year 2020 and thereafter the mine is expected to operate up to the year 2049.

The road network is likely to be used by employees and contractors for the transportation of materials and equipment and for the transportation of the mine produce. The majority of the employees will be from the neighbouring residential area. The ore extracted from the mine will be hauled to a processing plant in Polokwane or Rustenburg. Affected roads in the local road network include N11, D3502, R518 and local access roads to the nearby residential area.

Existing traffic conditions

On average approximately 4700 vehicles per day use the N11 of which about 11% (About 500 vehicles) are heavy vehicles. The R518 carries about 365 toward the east and 240 toward the west during the AM and PM peak hours. D3502and the rest of access roads carry very low volumes of not more than 30 vehicles in each direction during both the AM and PM peaks.

Existing public transport and non-motorised transport

Car ownership in Waterburg District Municipality, in which the study area resorts, is very low, the majority of the population walk or use public transport especially minibus taxis, which was validated during site visit observations. Buses and minibus taxis were observed travelling and picking up and dropping off passengers along the N11. There are taxi lay-bys along N11 in the vicinity of the site. Although there are no sidewalks, pedestrians were observed walking along the wide verges of the road.

Development traffic

Trip Generation Rates do not exist for Mining operations and associated activities based on the DoT's South African Trip Generation Rates, 2nd Edition, 1995. Therefore the Trip Generation was calculated based on employee figures received from Twickenham Mine and based on typical traffic generation assumptions relating to similar mining operations**.**

The mine is expected to generate additional vehicular trips of about 37 trips in 2015, 541 trips in 2017 and 48 trips in 2021 during both the AM and PM peak

Capacity analysis

Intersection capacity analysis was undertaken using SIDRA software. The purpose of the analysis was to determine existing and future volume/capacity ratios (v/c), delay (sec) and level of service (LOS) for different years of assessment and the associated traffic impact of the development proposal.

The capacity analysis results show that in the current year (2015) and operational only phase (2021) the development generated trips are expected to have a negligible impact on the surrounding network. However, for the 2017 scenario, notable delays would be experienced especially at the N11/Road A/ Site Access Road intersection which is expected to deteriorate from an overall LOS A to LOS C during the AM peak and from LOS A to LOS F.

To mitigate the development traffic impact and enhance mobility along the N11, the following upgrades are recommended:

- N11 northern approach to have one through lane, 60m left turning lane and 60m right turning lane.
- N11 southern approach to have one through lane, a slip lane and a 60m right turning lane.
- Road A 9access road to the nearby residential area) eastern approach to have one through and right turning lane, and 15m left turning lane.
- Site Access Road to have one through and left turning lane, and right turning lane.

Impact Significance

Mining traffic is expected to have direct or indirect impacts on traffic condition and driver delays, NMT delays; road safety; and road condition. The analysis illustrated that the additional development traffic is envisage to have negligible to minor impact on the traffic and road conditions as well as on non-motorised transport.

However the following mitigation measures are recommended to mitigate traffic impacts:

- To provide a safe environment for pedestrians, it is recommended that sidewalks of 100m be provided on both sides of the N11 in the vicinity of the site and the existing zebra crossing should be clearly remarked.
- In addition to the existing bus and taxi lay-bys provided along N11 in the vicinity of the site, a bus and taxi drop off area has been proposed on site.
- Drivers of all heavy vehicles to attend a specialised road safety and driving course that sensitises them to the impact that they have on driving conditions for other vehicles on the roads in the study area; and

Conclusion

From the analysis performed, all of the relevant intersections within the current road network associated with the proposed Ivanplats Mine have acceptable capacities (LOS) with the exception of some movements at the N11 / Road A and Site Access Road intersection. The recommended road upgrades at this intersection are not expected to have significant improvements on the overall level of service but will improve the flow along the N11 and thus minimises delays especially during the AM peak. To obtain much improved results, the intersection would have to be signalised, however SANRAL has indicated that this will compromise the mobility function of the N11. Consequently, SANRAL has indicated that signalising or converting to an all stop controlled intersection would not be an option at present. It is however important to note that this scenario is temporary and the future N11 ring road was not considered in this calculation which in future is expected to alleviate traffic from this section of N11with no adverse impact foreseen as a result of the proposed development.

The proposed Ivanplats Mine would have a minimal impact in terms of Environmental Impact Criteria and is also considered irreversible (i.e. the required new access will be permanent) however, this does not mean that the impact of the operations traffic as a result of long term use cannot be mitigated.

1 Introduction

Aurecon has been appointed by Digby Wells (Pty) Ltd to prepare a Traffic Impact Assessment (TIA) in support of the implementation of the proposed Ivanplats Platinum Mine in Limpopo.

The proposed mine is located along N11, about 15km north of Mokopane CBD. The site is surrounded by residential areas of Ga-Magongwa and Shamahansi to the north and east; Segkoboko and Ga-kgubudi to the west and south. Figure 1 shows the location of the site. The current land use of the site is agriculture, although mining activity and construction takes place at the site. The ore extracted from the mine will be hauled to a processing plant in Polokwane or Rustenburg.

The client has had discussions with SANRAL and agreed that this study should consider the traffic impact of the current activities on site. In 2013, IMPOFU Engineers conducted a traffic impact study for the same development which was not submitted to SANRAL for approval and this report serves as an update of that study.

The purpose of this report is to quantify the impact of the traffic generated by the proposed mine on the immediate road network surrounding it during the construction and operation phases of the mine and recommend any improvements which are necessary to accommodate the additional traffic.

1.1 Scope of Study

The methodology has considered the following aspects:

- Understanding current traffic conditions;
- Estimation of expected trips to be generated by the proposed mine during construction and operation phases;
- Conducting capacity analysis to define intersection level of service and recommend road upgrades, if required ;
- Predictions of E80 values for the purpose of pavement design;
- Evaluation of public and non-motorised transport requirements; and
- Advice and recommendations on traffic accommodation during the construction phase.

1.2 Approach and methodology

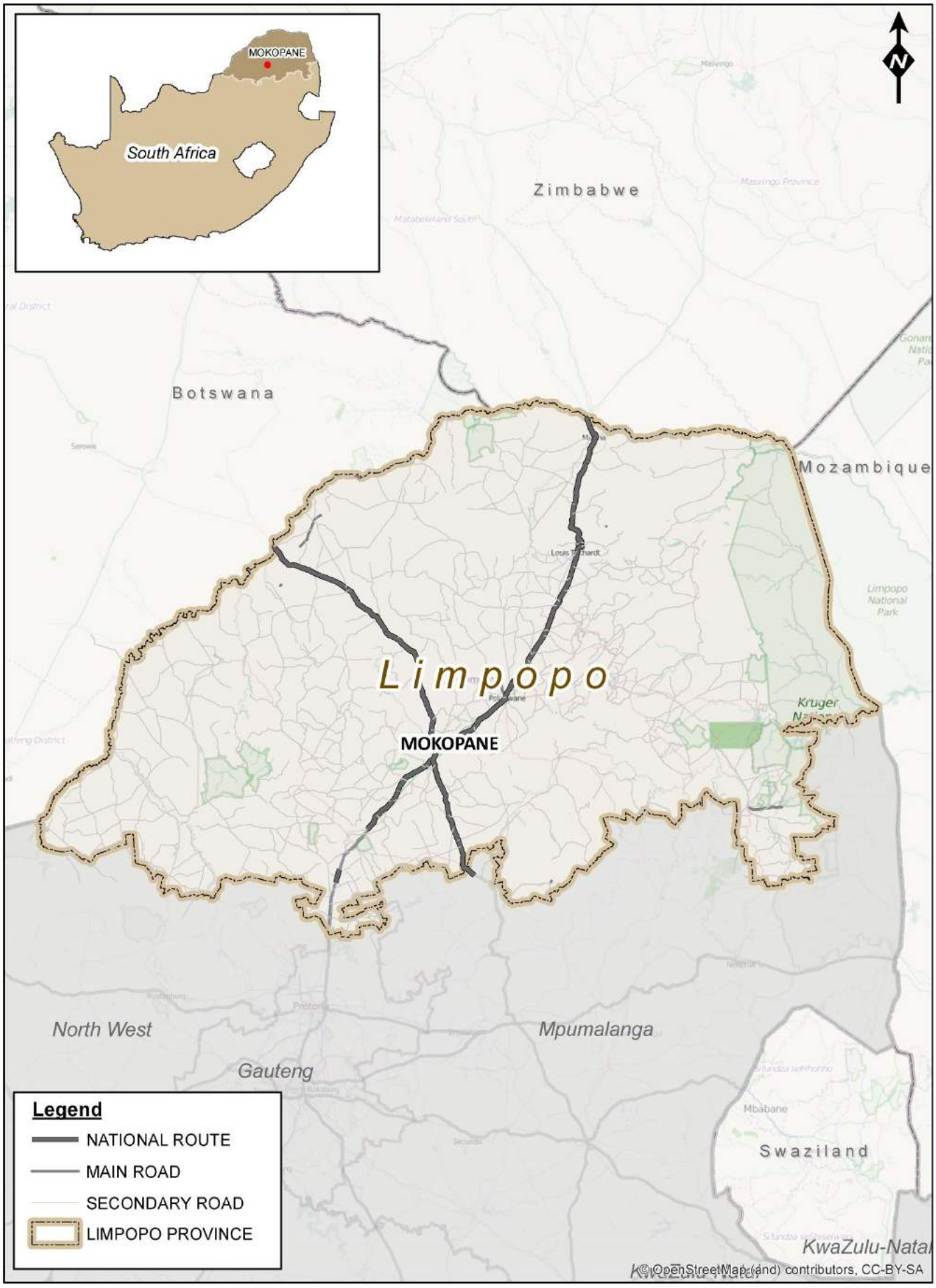
1.2.1 Assessment years

As mentioned above, construction and mine operations are currently taking place. Construction is scheduled to end by 2020 and thereafter the mine is expected to operate up to the year 2049. Workforce for construction and operations would vary between 2015 and 2021 with the largest workforce being hired in 2017. During the operational stage (after construction), the workforce is anticipated to be much less than during the construction phase and will remain more or less constant for most of the mine lifecycle, and decrease toward the end of the mine's life.

Against this background, the following scenarios were examined:

- Existing situation:
  - 2015 Background traffic AM and PM without development;
  - 2015 Background traffic AM and PM with development;
- Worst case scenario (when construction activities will peak):
  - 2017 Background traffic AM and PM without development;
  - 2017 Background traffic AM and PM with development;
- Operation scenario:
  - 2021 Background traffic AM and PM without development; and
  - 2021 Background traffic AM and PM with development.

Figure 1: Locality Plan



2013 Traffic count data as part of the traffic study conducted by IMPOFU Engineers was used as the baseline. A growth rate of 3% per annum was applied to the 2013 traffic data to generate 2015 and future (2017 and 2021) background traffic scenarios. This growth rate was agreed with SANRAL to also include any latent traffic in the area.

1.2.2 Analysis for intersection capacity

This TIA used SIDRA software to undertake intersection capacity analysis, since the intersections considered are reasonably well spaced and operate simplistically in terms of traffic flow.

1.2.3 Access evaluation

Access to the site is proposed from the N11. The access will be created by adding a fourth leg to an existing three-legged intersection. Capacity analysis of this intersection has also been undertaken using the SIDRA software as well as queuing analysis to understand the operations of the access.

1.2.4 Study Area

The following intersections have been assessed as part of the study area:

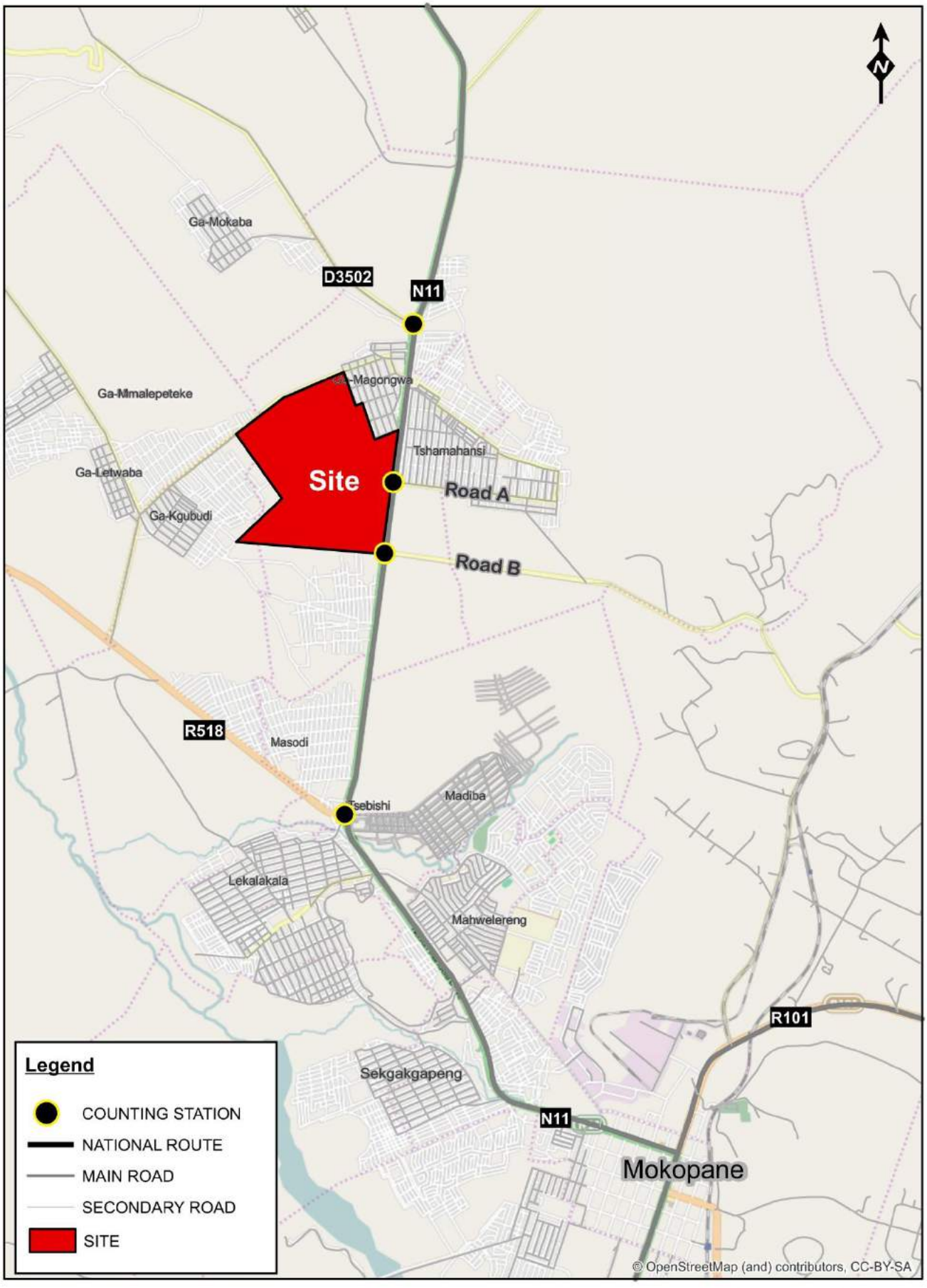
- N11 and D3502;
- N11 and Road A;
- N11 and Road B; and
- N11 and Road R518.

Figure 2 shows the surrounding road network.

1.2.5 Mitigation measures and or upgrades

Any mitigation measures required for this development are identified and specified. Specific recommendations are also made to improve pedestrian movement and facilities as well as public transport facilities.

Figure 2: Study area



STUDY AREA

2 Existing road conditions

2.1 Existing road network

The site enjoys very good regional accessibility as it is located along the N11 which is a major route that connects with the N1and R518 to the south and with R567 to the north of the site. The N1 is a principle national route that extends from Beit Bridge passing through Polokwane, Pretoria, Johannesburg and Bloemfontein to Cape Town and thus connecting the site to the region and the rest of the country. The N11 also forms part of a ring road with the R567 and R101 which is considered to be the backbone of the road network in Mokopane. Figure 2 shows the surrounding road network.

The surrounding road network can be described as follows:

2.1.1 N11



N11 is a national route running in a north-south direction from the South African border with Botswana in Limpopo through Mokopane, Middelburg, Ermelo and Newcastle to Ladysmith in Kwazulu-Natal. In In the study area, the N11 functions as a Class 2 road. The road has one lane in each direction past the site with intersections along the route.

2.1.2 D3502



D3502 can be classified as a Class 3 road providing a link to the N11 from the surrounding areas. Road D3502 has a single lane in each direction with no paved pedestrian sidewalks

2.1.3 Road A



Road A is classified as a Class 4 road as it is a collector for the local street network. The intersection with N11 is a one way stop, with a single lane in each direction.

2.1.4 Road B



Road B is a unpaved / gravel road which is classified as a Class 3 minor arterial; it provides connectivity between the N11 and the R101 and provides access to the mining activities west of the intersection.

2.1.5 R518



R518 is a provincial route that runs in an east-west direction from Zebediela through Mokopane and Marken to Lephalale and provides a regional link to the surrounding areas. The R518 functions as a Class 2 road in the study area and has one lane in each direction with gravel shoulders.

2.2 Existing traffic volumes

2.2.1 Site investigations

Classified traffic counts were undertaken by IMPOFU Professional Services on the 5th of September 2013 between 06h00 hrs and 18h00 hrs at the following locations:

- N11 and D3502;
- N11 and Road A;
- N11 and Road B; and
- N11 and Road R518.

Figure 4 and Figure 5 shows the 2013 weekday AM and PM peak volumes distribution respectively.

SANRAL counting station, between Mokopane & Gilead 2012 data was used to obtain an indication of annual traffic volumes as well as average daily traffic (ADT) and average daily truck traffic (ADTT).

A growth rate of 3% per annum (agreed with SANRAL) was applied to the 2013 traffic data to generate the current (2015) traffic volumes as shown in Figure 6 and 7, Figure 8 and 9, Figure 10 and 11 for the 2015, 2017 and 2021 weekday AM and PM peak background traffic distribution respectively.

The existing traffic volumes indicate the following:

- **N11:** The SANRAL counting station shows on average approximately 4700 vehicles per day use the N11 of which about 11% (About 500 vehicles) are heavy vehicles. The road has a directional split of approximately 50:50, northbound / southbound.

  The traffic count survey data shows that during the AM peak, approximately 560 vehicles travelled northbound and 240 vehicles travelled southbound. There are 300 vehicles travelling to the north and 570 vehicles travelling to the south during the PM peak hour.

- **D3502, Road A and Road B**: These roads carry very low volumes of not more than 30 vehicles in each direction during both the AM and PM peaks.

- **R518**: In comparison the R518 has higher volumes of about 365 toward the east and 240 toward the west.

Aurecon conducted a site visit on the 27th May 2015 in order to assess the extent of the study area that forms part of the TIA. The site visit conducted focussed on the road geometric layout, intersection layout, different transport modes using the route, traffic safety aspects, road condition and land use. Specific attention was given to intersections within the study area.

2.3 Existing Public Transport and non-motorised transport

Car ownership in Waterburg District Municipality, in which the study area resorts, is very low, the majority of the population walk or use public transport especially minibus taxis, which was validated during site visit observations.

2.3.1 Availability of Public Transport

Buses and minibus taxis observed travelling and picking up and dropping off passengers along the N11.

2.3.2 Public Transport and NMT Facilities

There are taxi lay-bys on either side of N11 before and after the N11 and Road A intersection in the vicinity of the site. However, there are no pedestrian sidewalks on either sides of the N11 except in the vicinity of the taxi lay-bys. Notwithstanding this, there are NMT signage and zebra crossing which, acknowledges pedestrian and animal drawn transportation movements in the study area.

3 Future road network plans

The recently completed Mogalakwena Municipality Roads and Stormwater Masterplan highlights SANRAL's plans for a proposed N11 Ring Road. The main driver behind the implementation of the Ring Road is to address the deteriorating level of service on the N11 as the road is mostly used by heavy vehicles to transport platinum from the Mogalakwena mines to Polokwane. The ring road will provide an alternative link from mines in its vicinity to the smelter at Polokwane.

The N11 Ring Road will divert traffic on the western side of the existing Sebetiela Toll Plaza in a northern direction and then follow a route along the existing N11 towards Mokopane from where it routes in a south-easterly direction passing east of Tshamahansi & Mahwelereng to link up with the existing R101 just north of Mokopane. This implies that the implementation of the N11 Ring Road will result in a significant reduction of heavy vehicles on the N11 passing the site. At this stage there is uncertainty about the timing of the ring road, SANRAL has suggested it may nobly be implemented after 2021, hence the assessment has not considered its implementation in this report given the capacity analysis scenarios considered.

The Figure 3 indicates the planned N11 Ring Road route from the N1 in the east to where it joins the existing N11 in the northwest.

Figure 3: Future N11 Ring Road



4 Trip generation

Traditionally, development traffic is estimated by applying trip generation rates from the South African Trip Generation Rates (SATGR) Manual. However, neither the "South African Trip Generation Rates (SATGR) Manual" (DoT, 1995) nor The Committee of Transport Officials' (COTO) South African Trip Data Manual (September 2012) have recommend trip rates for mines. As an alternative it was considered appropriate to estimate the mines trip generation from first principle because it is currently generates traffic it is possible to make certain assumption from observation and actual movements. Typical considerations included are the number of employees and traveller characteristics (e.g. mode split, vehicle occupancy).

For the purposes of this study the expected additional trips on the transport network were determined based on the numbers of employees per year of analysis and the total commodities and final products to be transported in and out of the mine during construction and operations. This data was supplied by the client.

The following sections outline the functions and data provided in estimating the site's trip generation.

4.1 Construction phase

Construction is currently underway and is expected to be completed by 2020. Table 1 shows construction workforce, construction working shifts and the number of delivery vehicles and waste material vehicles during the time periods specified.

Table 1: Construction phase workforce, shift and vehicles

Trip Generators	2015	2016	2017	2018	2019	2020
Employees/day/year	100	1,620	3,000	2,500	1,000	100
Construction working shifts	08h00 to 17h00					
Construction vehicles - concentrate Trucks (30 Tonnes) / day	100	100	100	100	100	100

As shown on Table 1 the workforce is expected to fluctuate during the 5 years of construction with the highest number of employees, 3000 being on site in 2017. It is expected that delivery vehicles and waste material vehicle trips will be constant throughout the construction period in support of the construction programme.

4.2 Operational phase

It is expected that 1050 tons of concentrate ore per day will be transported to Polokwane, resulting in 35 trucks (HGV's) per day transporting approximately 30 tonnes each. This implies a maximum number of 35 outbound trips from the site per day. Although the mining activities have already started, transportation of the ore is expected to start in 2020. Table 2 illustrates the operational phase's workforce, operation working shifts and the number of delivery vehicles.

Table 2: Operational workforce, shift and delivery vehicles

Trip Generators	2015	2016	2017	2018	2019	2020	2021 to 2049
Employees/day/year	350	450	2,934	2,789	1,099	1,191	1,071 to 588
Operation working shifts	Day shift 05h00 – 13h00, Afternoon shift 13h00 – 21h00, and Night shift 21h00 – 05h00.						
Delivery vehicles - concentrate Trucks (30 Tonnes) / day	0	0	0	0	0	35	35

Table 2 indicates that the workforce during the operational phase is expected to fluctuate with the highest number of employees, 2 934 per day in 2017.

4.3 Mode split

The mine plans to provide transportation for its employees using company buses. Aurecon understands that about 80% of the employees are expected to use company buses during construction and operational phases of the project. The remaining 20% are expected to use private cars. The majority of the work force will be from the local neighbouring residential areas.

4.4 Vehicle occupancy

The company buses will have a capacity of 40 passengers. Since not all staff will travel at the same time, it was assumed that during the peak hours buses would have an occupancy rate of 80%. In other words the busses would not be full. Vehicle occupancy of 1.5 was adopted for the private vehicles.

4.5 Assumptions

The following assumptions were made:

- 80% of construction workers arrive/depart at/from work during the AM and PM peak hr (very robust);
- For the mine operation, workforce is equally divided amongst the three shifts;
- Heavy vehicle are spread evenly throughout the working shifts (i.e. for construction between 08h00 to 17h00 and for operation between 05h00 to 21h00).

4.6 Trip generation results

As per section 1.2.1, trip generation was calculated for the following scenarios:

- Existing situation (construction and operation) - 2015 AM and PM peak;
- Worst case scenario (construction and operation): 2017 AM and PM peak; and
- Operation scenario (Construction only) - 2021 AM and PM peak

By applying the development functions and assumptions discussed above, the results of the trip generation are as shown in Table 3 and Table 4. The trips generated as a result of employment activity are referred to as commuter trips, which are categorised as private vehicle trips and public transport trips. The transportation of commodities and products will generate freight movement on the road network.

Table 3: Commuter person trips generation during AM/PM peak hour

Scenario	Construction workforce	Operations workforce	Mode split (%)		Person trips		
			Bus	Car	Bus	Car	Total
2015	80	117	80	20	157	39	197
2017	2400	978	80	20	2702	676	3378
2021	0	357	80	20	286	71	357

Table 3 shows that the mine is expected to generate about 197 person trips, 3378 person trips and 357 person trips in 2015, 2017 and 2021 respectively.

Table 4: Vehicle trips generation during AM/PM Peak Hour

Scenario	Vehicle trips per hour			
	Heavy vehicles	Bus	Car	Total
2015	6.0	5	26	37
2017	6.0	84	450	541
2012	2.0	9	48	48

Table 4 shows that the mine is expected to generate about 37 vehicle trips, 541 vehicle trips and 48 vehicle trips in 2015,2017 and 2021 respectively.

5 Trip distribution and assignment

Assumptions about the expected trip distribution were based on the location of the site, the existing traffic volumes, traffic count turning proportions and traffic patterns based on site observations.

The following trip distribution has been used for the purpose of analysis:

- 25% North on N11;
- 70% South on N11; and
- 5% to the west of the site.

Figures 12 and 13, Figure 14 and 15, Figure 16 and 17 show the development traffic distribution plus background traffic for 2015, 2017 and 2021 scenarios respectively.

6 Capacity analysis

6.1 Assessment criteria

The performance criteria to determine the level of service (LOS) is provided in Table 5 below. The level of service (LOS), delay and volume / capacity (v/c) have been defined in accordance with the *Highway Capacity Manual (HCM 2000).*

Table 5: Performance Criteria

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE Seconds (d)	
	Signal and Roundabouts	Stop and Give-Way / Yield Signs
A	d ≤ 10	d ≤ 10
B	10 < d ≤ 20	10 < d ≤ 15
C	20 < d ≤ 35	15 < d ≤ 25
D	35 < d ≤ 55	25 < d ≤ 35
E	55 < d ≤ 80	35 < d ≤ 50
F	d > 80	d ≥ 50

Level of Service (LOS) at intersections is measure of intersection performance, determined based on delay for unsignalised intersections. In most urban areas an overall rating of A to D are normally considered acceptable. Levels of service C or better are considered desirable and levels of service E and F are normally undesirable (*Department of Transport (DoT), Manual for Traffic Impact Studies, 1995*).

A measure of roadway performance as a result of freight movement, determined based on the Highway Capacity Manual (HCM) 2000 method. Table 6 below is an extract from Chapter 20, HCM 2000 showing the definition of the LOS. The threshold to consider any road upgrade is a LOS “D”.

Table 6: LOS criteria for two-lane highways in Class I

EXHIBIT 20-2. LOS CRITERIA FOR TWO-LANE HIGHWAYS IN CLASS I

LOS	Percent Time-Spent-Following	Average Travel Speed (km/h)
A	≤ 35	> 90
B	> 35–50	> 80–90
C	> 50–65	> 70–80
D	> 65–80	> 60–70
E	> 80	≤ 60

Note:
LOS F applies whenever the flow rate exceeds the segment capacity.

6.2 Analysed intersections

The following intersections were analysed using SIDRA software:

- **N11/ D3502**: This is a stop controlled junction with the N11 having priority. D3503 and N11 northern approach have one lane in each direction. N11 northern southern approach has a through lane and a short left-turning lane. Pedestrians are provided with marked black and white Zebra crossing at the intersection.
- **N11/ Road A**: This is also a stop controlled T-junction with N11 having priority. Road A has one lane in each direction and provide access to the community situated opposite the proposed development site. Both N11 approaches have through lanes and short turning lanes. The proposed access road to the site is planned to form a forth leg of this intersection.
- **N11/ Road B**: This is a T-junction with Road B approach stop controlled giving priority to N11. Road B is a gravel road which provides access to mines situated east of the intersection. N11 has one lane in each direction.

- **N11/ R518**: This is also a T-junction with R518 approach stop controlled giving priority to N11. The R518 has one lane in each direction and both approaches of the N11 have a through lane and short turning lanes.

6.3 Analysis results

Intersection capacity analyses in the study area were undertaken using the SIDRA software. The purpose of the analysis was to determine existing and future volume/capacity ratios (v/c), delays (sec) and Levels of Service (LOS) for different years of assessment and the traffic impact of the development proposal.

6.3.1 2015 Background Traffic

Table 7: 2015 Background Traffic analysis results

Intersection	Intersection Type	Approach	AM			PM		
			V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
N11/ D3502	Priority	N11- NB	0.308	0.3	A	0.096	0.7	A
		N11 - SB	0.090	0.2	A	0.276	0.2	A
		D3502 - EB	0.087	19.1	C	0.078	16.7	C
		Overall	**0.308**	**0.9**	**A**	**0.276**	**0.9**	**A**
N11/ Road A	Priority	N11 - NB	0.29	0.4	A	0.155	0.5	A
		Road A - WB	0.091	14.3	B	0.069	14.8	B
		N11 - SB	0.118	0.5	A	0.298	0.1	A
		Overall	**0.29**	**1.1**	**A**	**0.298**	**0.7**	**A**
N11/ Road B	Priority	N11 - NB	0.319	1.4	A	0.188	3.6	A
		Road B - WB	0.05	13.8	B	0.027	13.3	B
		N11 - SB	0.13	0.2	A	0.304	0.3	A
		Overall	**0.319**	**1.4**	**A**	**0.304**	**1.7**	**A**
N11/ R518	3-Way Stop	N11 - NB	2.024	1438	F	0.961	78	F
		N11 - SB	1.029	177	F	0.801	36.4	E
		R518 - EB	0.82	47.7	E	0.581	23.6	C
		Overall	**2.024**	**859.2**	**F**	**0.961**	**52.4**	**F**

Table 7 shows that overall all intersections are operating at acceptable levels of service (LOS A) except for the N11/R518 intersection which is operating at LOS F during both the AM and PM peak.

6.3.2 2015 Background Traffic plus Development Traffic

Table 8: 2015 Background traffic plus development traffic analysis results

Intersection	Intersection Type	Approach	AM			PM		
			V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
N11/ D3502	Priority	N11- NB	0.315	0.3	A	0.097	0.7	A
		N11 - SB	0.092	0.2	A	0.283	0.2	A
		D3502 - EB	0.094	19.7	C	0.088	17.2	C
		Overall	**0.315**	**0.9**	**A**	**0.283**	**1.0**	**A**
N11/ Road A	Priority	N11 - NB	0.299	0.5	A	0.157	0.6	A
		Road A - WB	0.127	17.2	C	0.084	16.6	C
		N11 - SB	0.141	4.7	A	0.301	2.2	A
		Road A - EB	0.025	21.4	C	0.118	20.9	C
		Overall	**0.299**	**2.7**	**A**	**0.301**	**2.8**	**A**
N11/ Road B	Priority	N11 - NB	0.327	1.5	A	0.19	3.8	A
		Road B - WB	0.052	14.1	B	0.027	13.5	B
		N11 - SB	0.132	0.2	A	0.312	0.3	A
		Overall	**0.327**	**1.4**	**A**	**0.312**	**1.7**	**A**
N11/ R518	3-Way Stop	N11 - NB	2.057	1488.8	F	0.959	76.9	F
		N11 - SB	1.034	181.9	F	0.821	39.2	E
		R518 - EB	0.824	48.8	E	0.586	23.9	C
		Overall	**2.057**	**893.1**	**F**	**0.969**	**52.9**	**F**

Table 8 shows that with the addition development traffic the overall LOS of all intersections is expected to remain the same with minimal increases in delays. This shows that the development traffic currently has negligible impact on the study area. The N11/ R518 intersection's operation remains poor at LOS F.

6.3.3 2017 Background Traffic

Table 9: 2017 Background traffic analysis results

Intersection	Intersection Type	Approach	AM			PM		
			V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
N11/ D3502	Priority	N11- NB	0.326	0.3	A	0.102	0.7	A
		N11 - SB	0.096	0.3	A	0.292	0.2	A
		D3502 - EB	0.106	20.5	C	0.093	17.7	C
		Overall	**0.326**	**1.0**	**A**	**0.292**	**1.0**	**A**
N11/ Road A	Priority	N11 - NB	0.308	0.4	A	0.164	0.6	A
		Road A - WB	0.105	15.1	C	0.084	15.9	C
		N11 - SB	0.125	0.5	A	0.316	0.1	A
		Overall	**0.308**	**1.1**	**A**	**0.316**	**0.8**	**A**
N11/ Road B	Priority	N11 - NB	0.339	1.6	A	0.201	4.1	A
		Road B - WB	0.059	14.4	B	0.034	14	B
		N11 - SB	0.139	0.2	A	0.323	0.3	A
		Overall	**0.339**	**1.5**	**A**	**0.323**	**1.9**	**A**
N11/ R518	3-Way Stop	N11 - NB	2.146	1605.6	F	1.019	111.7	F
		N11 - SB	1.091	255.9	F	0.846	43.8	E
		R518 - EB	0.869	59.4	F	0.617	25.2	D
		Overall	**2.146**	**974.2**	**F**	**1.019**	**70.5**	**F**

Table 9 shows that overall all intersections are operating at acceptable levels of service (LOS A) except for the N11/R518 intersection which is operating at LOS F during both the AM and PM peak.

6.3.4 2017 background traffic plus development traffic

Table 10: 2017 background traffic plus development traffic analysis results

Intersection	Intersection Type	Approach	AM			PM		
			V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
N11/ D3502	Priority	N11- NB	0.428	0.4	A	0.119	0.7	A
		N11 - SB	0.114	0.3	A	0.393	0.2	A
		D3502 - EB	0.216	33.7	D	0.295	31.4	D
		Overall	**0.428**	**1.4**	**A**	**0.393**	**1.9**	**A**
N11/ Road A	Priority	N11 - NB	0.308	1.8	A	0.164	1.2	A
		Road A - WB	1.206	397.1	F	0.222	31.5	D
		N11 - SB	0.511	7.7	A	0.316	0.6	A
			0.856	110.3	F	2.705	1431.5	F
		Overall	**1.206**	**34.5**	**D**	**2.705**	**448.7**	**F**
N11/ Road B	Priority	N11 - NB	0.453	2.6	A	0.224	7.5	A
		Road B - WB	0.096	20.2	C	0.054	19.1	C
		N11 - SB	0.159	0.2	A	0.437	0.2	A
		Overall	**0.453**	**2.3**	**A**	**0.437**	**2.8**	**A**
N11/ R518	3-Way Stop	N11 - NB	2.619	2366.7	F	0.995	96.7	F
		N11 - SB	1.169	374.5	F	1.14	305.2	F
		R518 - EB	0.933	89.9	F	0.681	31.1	D
		Overall	**2.619**	**1509.5**	**F**	**1.14**	**171.1**	**F**

With the additional development traffic, the overall LOS of all intersections is expected to remain the same with minimal increases in delays except for the N11/Road A/ Site Access Road which is expected to deteriorate from overall LOS A to LOS C during the AM peak and from LOS A to LOS F during the PM peak. This is due to significant delays expected on Road A eastern approach.

6.3.5 2021 background traffic

Table 11: 2021 background traffic analysis results

Intersection	Intersection Type	Approach	AM			PM		
			V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
N11/ D3502	Priority	N11- NB	0.368	0.3	A	0.114	0.7	A
		N11 - SB	0.108	0.3	A	0.329	0.2	A
		D3502 - EB	0.144	24.6	C	0.125	20.4	C
		Overall	**0.368**	**1.1**	**A**	**0.329**	**1.1**	**A**
N11/ Road A	Priority	N11 - NB	0.347	0.4	A	0.185	0.6	A
		Road A - WB	0.142	17.3	C	0.116	18.3	C
		N11 - SB	0.141	0.5	A	0.356	0.1	A
		Overall	**0.347**	**1.2**	**A**	**0.356**	**0.9**	**A**
N11/ Road B	Priority	N11 - NB	0.382	2	A	0.227	5.2	A
		Road B - WB	0.082	16.7	C	0.046	15.8	C
		N11 - SB	0.156	0.2	A	0.364	0.3	A
		Overall	**0.382**	**1.9**	**A**	**0.364**	**2.4**	**A**
N11/ R518	3-Way Stop	N11 - NB	2.413	1973.6	F	1.147	223.3	F
		N11 - SB	1.227	470.5	F	0.954	83.4	F
		R518 - EB	0.98	116.8	F	0.694	29.8	D
		Overall	**2.413**	**1241.3**	**F**	**1.147**	**135.2**	**F**

Similar to the 2015 and 2017 background scenarios, Table 11 shows that all intersections operate within capacity and acceptable LOS except for the N11/R518 intersection performs poorly during both peak hours, with a LOS F.

6.3.6 2021 Background traffic plus development traffic

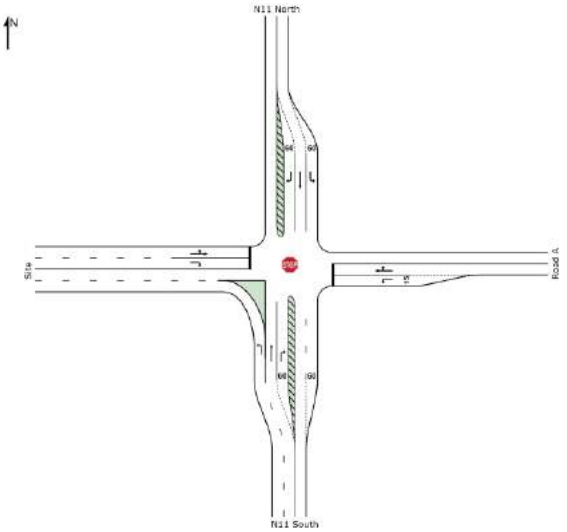
Table 12: 2021 Background traffic plus development traffic analysis results

Intersection	Intersection Type	Approach	AM			PM		
			V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
N11/ D3502	Priority	N11- NB	0.373	0.4	A	0.115	0.7	A
		N11 - SB	0.109	0.3	A	0.335	0.2	A
		D3502 - EB	0.154	25.3	D	0.142	21.3	C
		Overall	**0.373**	**1.1**	**A**	**0.335**	**1.2**	**A**
N11/ Road A	Priority	N11 - NB	0.367	0.7	A	0.189	0.7	A
		Road A - WB	0.209	22	C	0.148	21.4	C
		N11 - SB	0.166	6.6	A	0.357	3.2	A
		Road A - EB	0.065	32.8	D	0.395	44.3	E
		Overall	**0.367**	**3.6**	**A**	**0.395**	**4.9**	**A**
N11/ Road B	Priority	N11 - NB	0.401	2.2	A	0.231	5.8	A
		Road B - WB	0.089	17.7	C	0.05	16.7	C
		N11 - SB	0.16	0.2	A	0.383	0.3	A
		Overall	**0.401**	**2.1**	**A**	**0.383**	**2.5**	**A**
N11/ R518	3-Way Stop	N11 - NB	2.495	2102.9	F	1.142	217.7	F
		N11 - SB	1.24	491.8	F	1.005	123.3	F
		R518 - EB	0.991	127.4	F	0.705	31	D
		Overall	**2.495**	**1331.7**	**F**	**1.142**	**146.2**	**F**

Table 12 shows that with the addition development traffic the overall LOS of all intersections is expected to remain the same with minimal increases in delays. Once more this indicates that the development traffic is expected to have negligible impact on the study area. The growth in background traffic is mainly the cause for the deterioration in intersection operations.

6.3.7 Road upgrades and mitigation measures for 2017 scenario

The additional development traffic is expected to have minimal impact on the study area for most of the mine's operational period. However, there should be consideration to increase road capacity for the worst case scenario (2017) particularly at the N11/Road-A/ site Access Road intersection. The following road upgrades are recommended:



- N11 northern approach to have one through lane, 60m left turning lane and 60m right turning lane.
- N11 southern approach to have one through lane, a slip lane and a 60m right turning lane.
- Road A eastern approach to have one through and right turning lane, and 15m separate left turning lane.
- Site Access Road to have one through and left turning lane, and separate right turning lane.

Table 13 shows the road upgrade analysis results.

Intersection	Intersection Type	Approach	AM			PM		
			V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
N11/ Road A/ Site Access Road	Priority	N11 - NB	0.428	1.8	A	0.185	1.1	A
		Road A - WB	0.843	118	F	0.192	25	D
		N11 - SB	0.601	18.8	C	0.356	3.5	A
		Road A - EB	0.703	73.7	F	2.324	2431.1	F
		Overall	**0.843**	**18.5**	**C**	**2.324**	**762.1**	**F**

Table 13: Road upgrades and mitigation measures

Table 13 shows that the road upgrades are not expected to have significant improvements on the overall level of service but improve the flow along the N11 and thus minimises delays especially during the AM peak. To obtain much improved results, the intersection would have to be signalised, however SANRAL has indicated that this will compromise the mobility function of the N11. Consequently, SANRAL has indicated that signalising or converting to an all stop controlled intersection would not be an option at present. It is however important to note that this scenario is temporary and the future N11 ring road was not considered in this calculation which in future is expected to alleviate traffic from this section of N11.

7 Public transport and non-motorised transport

7.1 Public transport

Based on the trip generation results, about 5, 84 and 9 bus trips are expected to transport workers during the morning and evening hour in 2015, 2017 and 2021 respectively. In addition to the existing bus and taxi lay-bys provided along N11 in the vicinity of the site, the site development plan (SDP) (see appendix A) for the proposed mine shows a proposed bus and taxi drop off area planned to be provided on site. The introduction of public transport facilities on site will greatly enhance the site's sustainability from a transport point of view.

7.2 Non-motorised transport

During our site visits on 27 May 2015, a notable number of pedestrians and animal drawn transportation were observed along the N11. To provide a safe environment for pedestrians, it is recommended that sidewalks of 100m be provided on both sides of the N11 in the vicinity of the site and the existing zebra crossing should be clearly remarked.

8 Assessment of Traffic Impact in terms of Environmental Impact

The predicted impacts of the traffic generated by the proposed expansion at the Ivanplats Mine on the surrounding road network have been evaluated and are reported in this section of the report. The purpose of this impact evaluation is to assign relative significance to the predicted traffic impacts associated with the mining activities and to determine the manner in which these impacts are to be avoided, mitigated or managed, if needs be.

Mining traffic is expected to have direct or indirect impacts on the following:

- Traffic condition and driver delays;
- NMT delays;
- Road safety; and
- Road condition.

The EIA also examines other areas in which transport is part of the overall impact. These additional impacts are:

- Noise;
- Visual impacts;
- Vibration;
- Air Quality;
- Ecological; and
- Heritage and conservation areas.

8.1 Criteria for environmental considerations

The impact assessment criteria are based on guidance provided by the Institute of Environmental Assessment (1993) - Guidelines for the Environmental Assessment of Road Traffic as well as South African legislation and consist of the following:

- Nature of impacts (direct/indirect, positive/ negative);
- Duration (short/medium/long term, permanent(irreversible) / temporary (reversible), frequent/seldom);
- Extent (geographical area, size of affected population/habitat/species);
- Intensity (minimal, severe, replaceable/irreplaceable);
- Probability (high/medium/low probability); and
- Possibility to mitigate, avoid or offset significant adverse impacts.

With the exception of nature of impact which indicates whether the impact is positive or negative, each criterion is weighted on a scale of 1 to 7 as detailed in Appendix A with 1 indicating no or negligible impact and 7 the highest level of impact. The significance of an impact is established using an impact/risk assessment formula shown below.

Significance = (Intensity + Extent + Duration) x Probability x Nature

Any significant impact is then described in terms of proposed mitigation measure(s). It is important to note that the significance of an impact is considered in concert with the probability of that impact occurring. Lastly, the reversibility of the impact is estimated.

8.2 Impact on traffic condition and driver delays

The proposed construction and operations phases at the Ivanplats Mine project will generate additional traffic along the N11, D3502, Road A and Road B and R518, however, significant impact is expected along the N1.

Construction and operation phase (2015-2020)

At present, the construction activities have increased the background traffic along N11 in the vicinity of the by approximately 2% during both the AM and PM peak hours. However in 2017 the additional traffic generated by the mine is expected to increase the background traffic by approximately 28% along the same section of N11. Considering the background traffic volumes are relatively high, significant driver delays are expected especially at the N11/ Road/ Site Access Road intersection. The capacity analysis results in section 6.3 show drivers, especially from the Road A approach, would experience up to 7 minutes delays.

Key intersections in the study area also expected to experience delays, however the intersections' LOS is expected to remain at current LOS or within acceptable range. Other side roads along N11 might experience delays as the ability to find gaps in the traffic to join or N11 would be reduced.

Operation phase (2020 onward)

During operation period, peak hour volumes along N11 past the site are expected to increase by less than 5% during both peak hours. These increases are lower compared to the previous phase and minimal impact is expected. The capacity results have indicated that overall LOS of all intersections is expected to remain the same with minimal increases in delays.

8.3 Impact on NMT delays

The ability of pedestrians, cyclist and animal drawn transportation to cross the road safely is dependent on traffic volumes and vehicle speed. Thus additional traffic would increase NMT delays as NMT users would have to wait longer to cross the road safely.

Construction and operation phase (2015-2020)

Due to the significant traffic volume increase along N11 in 2017, NMT delays are expected along the N11 especially in the vicinity of the site. Currently, there are zebra crossings at the N11 / Road A / Site Access road intersection which are meant to give priority right of way to NMT users. If the operation rules of zebra crossing are adhered to by vehicle drivers and NMT users, NMT delays could be minimised.

Operation phase (2020 onward)

Mine generated traffic volumes are expected to drop notably during the operational phase of the mine. Similarly Zebra crossing would minimise delays.

8.4 Impact on road safety conditions

It is important to note that the N11 functions as a mobility spine and as a result it does not present a safe environment for NMT to cross at grade as the vehicle speeds are relatively high. In addition, Heavy vehicles have been identified as one of the major causes of accidents and incidents on this road network.

Construction Phase

During construction, the mine is expected to generate about 100 additional heavy vehicles per day onto the road network per day. This would increase the heavy vehicle percentage by 18% which is a notable increase. Whilst the responsibility for road safety on public roads is not that of the private mining companies, the Ivanplats Mine project can implement measures to reduce the frustration experienced by the motoring public on these roads. It is therefore recommended that the drivers of all heavy vehicles be required to attend a specialised road safety and driving course that sensitises them to the impact that they have on driving conditions for other vehicles on these roads.

Operation Phase

The mine is expected to generate 35 heavy vehicles per day during the operation period contributing to a 5% increase of heavy vehicle in the vicinity of the site. Safety precautions as discussed in the section above are also recommended.

8.5 Impact on road condition

Numerous provincial roads in the district are not sealed, or not designed for heavy vehicles. Extensive mining operations in the Waterberg District have increased the volumes of heavy vehicles and thus deteriorating

road conditions. The increase in traffic generated by the proposed Ivanplats Mine project activities will increase the percentage of heavy vehicles using the N11 and as a result accelerate the deterioration of these roads.

With the exception of the Mine Access Road, all other roads to be used by the traffic generated by the mine are under the jurisdiction of the Limpopo Department of Transport. It is this department's responsibility to repair and rehabilitate these roads and not the mining houses. It is therefore recommended that a standard operating procedure be developed by the Ivanplats Mine management responsible for operations, for all mine drivers to identify and report potholes and edge breaks on these provincial roads to the operations manager who in turn will report it to the Limpopo Department of Transport. In this way the proposed Ivanplats Mine project will have completed its obligations in bringing to the attention the deterioration of the road to the relevant department.

8.6 Assessment of impacts before and after Mitigation

The impact of the development traffic on the condition of the surrounding public road network and traffic conditions is quantified in Table 18.

Table 14: Significance rating results:

Activity and Interaction (Additional traffic result in driver delays)			
Dimension	**Rating**	**Motivation[1]**	**Significance**
Impact Description: Increase in traffic volumes due to additional traffic generated by the mine			
Prior to mitigation/ management			
Duration	Project Life (>15 years): (5)	Traffic impact will cease after the operational life span of the project	Minor (negative) – 68
Extent	Local (2)	Notable impact is expected in the local road network	
Intensity x type of impact	Serious loss (-4)	Driver delays would increase to 7minutes at busiest intersection	
Probability	Definite (7)	It is definite that the mine will generate additional traffic.	
Mitigation/ Management actions[2]			
Road upgrades at the N11/ Road A/ site Access road intersection			
Post- mitigation			
Duration	Project Life (>15 years): (5)	Traffic impact will cease after the operational life span of the project	Minor (negative) – 52
Extent	Local (2)	Notable impact is expected in the local road network	
Intensity x type of impact	Moderate loss (-3)	Slight improvement is expected with proposed road upgrades	
Probability	Definite (7)	It is definite that the mine will generate additional traffic.	
Activity and Interaction (Additional vehicle traffic, pedestrians and cyclist increase pedestrian and cyclists delays)			
Impact Description: Increase in vehicle traffic, pedestrians and cyclist due to additional traffic generated by the mine.			
Prior to mitigation/ management			
Duration	Project Life (>15 years): (6)	Traffic impact will cease after the operational life span of the project	Negligible (negative) -24
Extent	Limited (2)	Notable impact is expected in the local road network	
Intensity x type of impact	Minor loss (-2)	The existing zebra crossing facilitates safe crossing and gives priority to NMT users.	
Probability	Definite (6)	It is most likely that the additional traffic will increase NMT delays.	
Mitigation/ Management actions[3]			
None			
Post management			
Duration	Project Life (>15 years): (5)	Traffic impact will cease after the operational life span of the project	Negligible (negative) -24
Extent	Very limited (2)	Notable impact is expected in the local road network	
Intensity x type of impact	Minimal loss (-2)	The existing zebra crossing facilitates safe crossing and gives priority to NMT users.	
Probability	Definite (6)	It is most likely that the additional traffic will increase NMT delays.	

Activity and Interaction (Additional traffic result to reduced road safety for road users)			
Impact Description: increase in traffic volumes (heavy vehicle in particular)increase accident risk			
Prior to mitigation/ management			
Duration	Project Life (>15 years): (5)	Traffic impact will cease after the operational life span of the project	Negligible (negative) -24
Extent	Local (3)	Notable impact is expected in the local road network	
Intensity x type of impact	Minimal to no loss (-2)	Road safety precautions can be adopted thus repairable	
Probability	Highly probable (6)	It is mostly likely that the safety of the road user would be somewhat compromised.	
Mitigation/ Management actions[4]			
Driver safety training Provide sidewalks in the vicinity of the site Provide public transport facilities on site			
Post management			
Duration	Project Life (>15 years): (5)	Traffic impact will cease after the operational life span of the project	-12
Extent	Very limited (1)	Pedestrian would have a safer environment in the vicinity of the site	
Intensity x type of impact	Minimal loss (-1)	Driver training would promote safer driving	
Probability	Definite (6)	It is definite that the mine will generate additional vehicle, pedestrian and cyclist trips.	
Activity and Interaction (Increase in heavy vehicle result in deterioration of road conditions)			
Impact Description: Additional heavy vehicle increase loading on road thus damaging the roads			
Prior to mitigation/ management			
Duration	Project Life (>15 years): (5)	Traffic impact will cease after the operational life span of the project	-36
Extent	Local (2)	Notable impact is expected in the local road network	
Intensity x type of impact	Moderate loss (-3)	Damaged roads increase risk of accidents	
Probability	Highly probable (6)	It is mostly likely that the safety of the road user would be somewhat compromise.	
Mitigation/ Management actions[5]			
Road rehabilitation			
Post management			
Duration	Project Life (>15 years): (5)	Traffic impact will cease after the operational life span of the project	-26
Extent	Locall (2)	Notable impact is expected in the local road network	
Intensity x type of impact	Minimal to no loss (-2)	Good road conditions after rehabilitation thus minimising accident risk.	
Probability	Highly probable (6)	It is mostly likely that the safety of the road user would be somewhat compromise.	

It can therefore be concluded that the additional development traffic is envisage to have negligible to minor impact on the traffic and road conditions as well as on non-motorised transport.

9 Conclusion and recommendation

Aurecon has been appointed by Digby Wells (Pty) Ltd to prepare a Traffic Impact Assessment (TIA) in support the implementation of the proposed Ivanplats Platinum Mine in Limpopo.

The following conclusions are drawn:

- The current land use of the site is agriculture and the proposal is to establish a platinum mine. The ore extracted from the mine will be hauled to a processing plant in Polokwane or Rustenburg.
- The study considered the construction and operation phases of the mine. Tables below show the workforce, working shifts and the number of delivery heavy vehicles for each phase.

Construction workforce, shift and vehicles

Trip Generators	2015	2016	2017	2018	2019	2020
Employees/day/year	100	1,620	3,000	2,500	1,000	100
Construction working shifts	08h00 to 17h00					
Construction vehicles - concentrate Trucks (30 Tonnes) / day	100	100	100	100	100	100

Operation workforce, shift and delivery vehicles

Trip Generators	2015	2016	2017	2018	2019	2020	2021 to 2049
Employees/day/year	350	450	2,934	2,789	1,099	1,191	1,071 to 588
Operation working shifts	Day shift 05h00 – 13h00, Afternoon shift 13h00 – 21h00, and Night shift 21h00 – 05h00.						
Delivery vehicles - concentrate Trucks (30 Tonnes) / day	0	0	0	0	0	35	35

- As illustrated above mining activity and construction are currently underway. Construction has been planned to end by 2020. The following scenarios were considered for trip generation and capacity analysis purposes:
  - Existing situation (construction and operation):
    - 2015 Background traffic AM and PM without development;
    - 2015 Background traffic AM and PM with development;
  - Worst case scenario (construction and operation):
    - 2017 Background traffic AM and PM without development;
    - 2017 Background traffic AM and PM with development;
  - Operation scenario(operation only):
    - 2021 Background traffic AM and PM without development; and
    - 2021 Background traffic AM and PM with development.
- The mine is expected to generate additional vehicular trips of about 37 trips in 2015, 541 trips in 2017 and 48 trips in 2021 during both the AM and PM peak.
- For 2015 and 2021 scenarios, the capacity analysis results indicate that the development trips are expected to have a negligible impact on the surrounding network. For the 2017 scenario, however, notable delays would be experienced especially at the N11/Road A/ Site Access Road intersection which is expected to deteriorate from an overall LOS A to LOS C during the AM peak and from LOS A to LOS F.
- To mitigate the development traffic impact and enhance the mobility along the N11, the following upgrades are recommend:

  - N11 northern approach to have one through lane, 60m left turning lane and 60m right turning lane.
  - N11 southern approach to have one through lane, a slip lane and a 60m right turning lane.
  - Road A eastern approach to have one through and right turning lane, and 15m left turning lane.
  - Site Access Road to have one through and left turning lane, and right turning lane.
- To provide a safe environment for pedestrians, it is recommended that sidewalks of 100m be provided on both sides of the N11 in the vicinity of the site and the existing zebra crossing should be clearly remarked.
- In addition to the existing bus and taxi lay-bys provided along N11 in the vicinity of the site, a bus and taxi drop off area has been proposed on site.
- It can therefore be concluded that the additional development traffic is envisage to have negligible to minor impact on the traffic and road conditions as well as on non-motorised transport.

Figures

Figure 4: 2013 Background traffic AM peak

Figure 5: 2013 Background traffic PM peak

Figure 6: 2015 Background traffic AM peak

Figure 7: 2015 Background traffic PM peak

Figure 8: 2017 Background traffic AM peak

Figure 9: 2017 Background traffic PM peak

Figure 10: 2021 Background traffic AM peak

Figure 11: 2021 Background traffic PM peak

Figure 12: 2015 Background traffic plus development traffic AM peak

Figure 13: 2015 Background traffic plus development traffic PM peak

Figure 14: 2017 Background traffic plus development traffic AM peak

Figure 15: 2017 Background traffic plus development traffic PM peak

Figure 16: 2021 Background traffic plus development traffic AM peak

Figure 17: 2021 Background traffic plus development traffic PM peak

Appendices



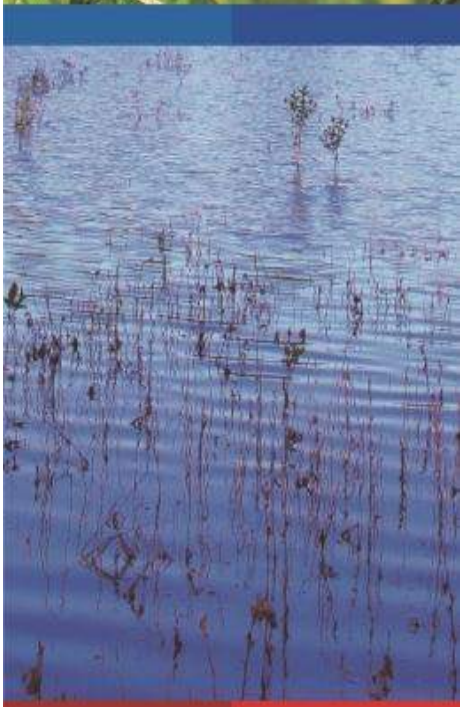
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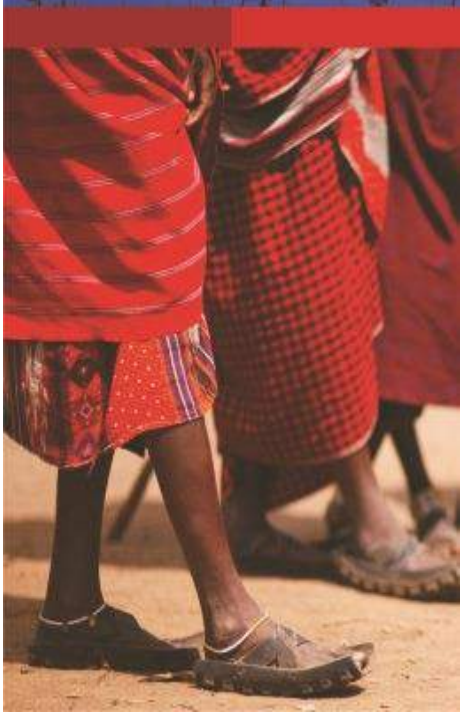
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Appendix H: Addendum Noise Impact Assessment Report







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Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province

Noise Impact Assessment Addendum Report

Project Number:

IVA3396

Prepared for:

Ivanplats (Pty) Ltd

January 2016

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Report Type:	**Noise Impact Assessment Addendum Report**
Project Name:	**Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province**
Project Code:	**IVA3396**

Name	Responsibility	Signature	Date
Lukas Sadler	Report Compiler		18 December 2015
Michael Hennessy	Reviewer		21 December 2015
Bradly Thornton	Final Review		11 January 2016

This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.

EXECUTIVE SUMMARY

Ivanplats is the holder of a Mining Right with reference LP30/5/1/2/2/10067MR for its Platreef Project (the Project), issued by the Department of Mineral Resources (DMR) on 04 November 2014. Since this time, Ivanplats has also been granted an Environmental Authorisation (EA) as amended and Waste Management Licence (WML). Since the granting of these licences, Ivanplats has commenced with the sinking of one of the planned mine production shafts (i.e. Shaft 1) as well as the development of certain project infrastructure such as the installation of a mine boundary fence.

Prior to the installation of the mine boundary fence and during site establishment, the planned mine infrastructure area which covered an approximate 345.3 hectares (ha) was encroached on by surrounding communities. As a result of the encroachment, Ivanplats was required to revise the mine layout plan by amending the footprint and/or location of certain activities/infrastructure.

Digby Wells Environmental has been appointed by Ivanplats to review these amendments and identify and assess any additional impacts that may result from these amendments. This noise impact assessment specialist report therefore serves as an addendum to the existing noise impact assessment specialist report compiled for the Platreef Project undertaken in 2013.

This report assesses the potential noise impacts of the Project's amendments on the surrounding communities. The approach used the National Noise Control Regulations, GN R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) as well as the South African National Standards for "The measurement and rating of environmental noise with respect to nuisance and speech communication" (SANS 10103:2008), to assess the baseline and potential impacts.

This environmental noise impact assessment report forms part of the larger Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) Report and entails:

- An update on the noise sources and potential noise sensitive receptors;
- Assess the anticipated noise impacts associated with the current project activities during the construction, operational, decommissioning and post-closure phases; and
- Provide relevant mitigation measures, a management plan and monitoring programme relevant to those project activities which have now been amended,

No baseline measurements were taken during the addendum project due to comprehensive baseline data being available from the initial Platreef noise impact assessment. In terms of the baseline conditions, it may be noted that the existing ambient noise levels in the immediate area are characteristic of suburban surroundings with noise levels ranging from 45 dBA to 52 dBA, which is in line with what is expected.

It is concluded that the proposed amendments and the associated activities are expected to cause a noise disturbance, as contemplated in the National Noise Control Regulations, at the surrounding communities of Ga-Kgobudi, Sekgoboko, Ga-Magongoa and Ga-Kgobudi 2 (Mzombane). The noise impact will mainly be on the encroached areas where the mining activities will measure 7dBA and more at certain distances into the encroached areas. According to the SANS 10103:2008 categories of community/group response guidelines (refer to Table 3-2), there is likely to be a medium to strong response towards the noise from the mine. The results of the modelling scenarios already include the noise barrier effectiveness of the waste rock berm at 10 m.

The overall calculated significance of the noise impact during the construction, operational and decommissioning phase is minor negative, moderate negative and minor negative respectively.

The significance of the impact from the initial noise assessment compared to the addendum assessment has increased due to the re-positioning of infrastructure as well as the result of encroachment by certain surrounding communities.

If the rising of the berm is impractical it is recommended that Ivanplats apply for exemption from provisions of the noise control regulations as per regulation 7, due to the encroachment of certain households that may be impacted on by the mining activities.

It is the professional opinion of the author that the project proceed for the reason that it is possible to apply for exemption from provisions of the noise control regulations.

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1 Introduction

1.1 Project Background

Ivanplats (Pty) Ltd (hereafter Ivanplats) wishes to develop and operate the Platreef underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (the Project).

The Project is located on the Northern Limb of the Bushveld Igneous Complex (BIC), approximately 280 km northeast of Johannesburg and 8 km northwest of the town of Mokopane in Limpopo Province of South Africa. The Project is located on the farms Macalacaskop 243 KR and Turfspruit 241 KR with the construction of a Tailings Storage Facility (TSF) on the farm Rietfontein 2 KS.

Ivanplats is the holder of a Mining Right with reference LP30/5/2/2/1/10067MR, issued by the Department of Mineral Resources (DMR) on 04 November 2014. Since this time, Ivanplats has also been granted an Environmental Authorisation (EA) and Waste Management Licence (WML). Since the granting of these licences, Ivanplats has commenced with the sinking of ventilation intake Shaft as well as the development of certain project infrastructure such as the installation of a mine boundary fence.

Prior to the installation of the mine boundary fence and during site establishment, the planned mine infrastructure area which covered an approximate 420 hectares (ha) was encroached on by surrounding communities. As a result of the encroachment, Ivanplats was required to revise the mine layout plan by amending the footprint and/or location of certain activities/infrastructure. The total area of the mine infrastructure area is now 345 ha, thus reducing the approved area by 74 ha.

Digby Wells Environmental has been appointed by Ivanplats to review these amendments and identify and assess any additional impacts that may result from these amendments. This noise impact assessment specialist report therefore serves as an addendum to the existing noise impact assessment specialist report compiled for the Project in 2013.

1.2 Terms of Reference

This report relates specifically to the noise impacts of the proposed footprint amendment and/or amendments of the location of certain activities/infrastructure. The immediate area surrounding the Project will be classed as mainly suburban because of the close proximity to the town of Mokopane. The approach used in investigating the noise impacts is based on the National Noise Control Regulations, R.154 of 10 January 1992 (the Noise Regulations) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989).

The following additional legislation and standards were also considered during the assessment:

- The National Environmental Management Act, 1998 (Act 107 of 1998), NEMA;
- The National Environmental Management Air Quality Act, 2004 (Act 39 of 2004), NEMAQA; and
- The South African National Standards SANS 10103:2008 “The measurement and rating of environmental noise with respect to annoyance and to speech communication” (SANS 10103:2008).

The Environmental Noise Impact Assessment Report includes a baseline assessment and predicted noise impacts on the identified noise sensitive receptors by use of noise dispersion modelling as well as recommendations and mitigation measures for potential impacts.

1.3 Aim and Objectives

The aim of the study was to assess the amended project activities against the existing baseline noise levels. To achieve, an assessment via predictive noise dispersion modelling, of the potential impact of the noise emissions from the proposed mining activities on the surrounding environment was undertaken. No baseline field work was undertaken for the addendum project due to comprehensive baseline data being available from the initial Platreef noise impact assessment undertaken in 2013.

2 Specialist Details

Lukas Sadler has a B.COM degree in Geography and Environmental Management, including short courses in Environmental Noise Assessments, Environmental Noise Control and Air Quality Management as well as local and international work experience in the environmental sciences field. This includes experience working with projects in accordance with the International Finance Corporation (IFC) and World Bank standards. Lukas has also gained experience working in Mali, Senegal, Ghana, Sierra Leone, DRC, Liberia, Mozambique and Namibia. At Digby Wells, Lukas’ core focus is working on environmental noise impact assessments, which includes baseline noise monitoring surveys, noise dispersion modelling and noise management programmes. A curriculum vitae (CV) and declaration of independence is attached in Appendix A.

3 Methodology

3.1 Desktop Assessment

The approach used in investigating noise impacts is based on the Noise Regulations as well as guidelines provided by SANS 10103:2008. According to the SANS 10103:2008 "The measurement and rating of environmental noise with respect to annoyance and to speech communication", the sound pressure level is used as the measurement unit for noise levels. The acceptable rating levels according to SANS 10103:2008 for ambient noise in different districts (residential and non-residential) are presented in Table 3-1.

Table 3-1: Acceptable rating levels for noise in districts (SANS 10103, 2008)

Type of District	Equivalent continuous rating level ($L_{Reg.T}$) for noise (dBA)					
	Outdoors			Indoors, with open windows		
	Day-night	Day-time	Night-time	Day-night	Day-time	Night-time
	$L_{R,dn}$ [a]	$L_{Req,d}$ [b]	$L_{Req,n}$ [b]	$L_{R,dn}$ [a]	$L_{Req,d}$ [b]	$L_{Req,n}$ [b]
RESIDENTIAL DISTRICTS						
a) Rural districts	45	45	35	35	35	25
b) Suburban districts with little road traffic	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
NON-RESIDENTIAL DISTRICTS						
d) Urban districts with some workshops, with business premises, and with main roads	60	60	50	50	50	40
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50
NOTE 1 If the measurement or calculation time interval is considerably shorter than the reference time intervals, significant deviations from the values given in the table might result.						
NOTE 2 If the spectrum of the sound contains significant low frequency components, or when an unbalanced spectrum towards the low frequencies is suspected, special precautions should be taken and specialist advice should be obtained. In this case the indoor sound levels might significantly differ from the values given in columns 5 to 7						
NOTE 3 In districts where outdoor LR,dn exceeds 55 dBA, residential buildings (e.g. dormitories, hotel accommodation and residences) should preferably be treated acoustically to obtain indoor LReq,T values in line with those given in table 1.						

Type of District	Equivalent continuous rating level ($L_{Reg.T}$) for noise (dBA)					
	Outdoors			Indoors, with open windows		
	Day-night	Day-time	Night-time	Day-night	Day-time	Night-time
	$L_{R,dn}$[a]	$L_{Req,d}$[b]	$L_{Req,n}$[b]	$L_{R,dn}$[a]	$L_{Req,d}$[b]	$L_{Req,n}$[b]
NOTE 4 For industrial districts, the LR,dn concept does not necessarily hold. For industries legitimately operating in an industrial district during the entire 24 h day/night cycle, LReq,d = LReq,n =70 dBA can be considered as typical and normal.						
NOTE 5 The values given in columns 2 and 5 in this table are equivalent continuous rating levels and include corrections for tonal character, impulsiveness of the noise and the time of day.						
NOTE 6 The noise from individual noise sources produced, or caused to be produced, by humans within natural quiet spaces such as national parks, wilderness areas and bird sanctuaries, should not exceed a maximum Weighted sound pressure level of 50 dBA at a distance of 15 m from each individual source.						
a The values given in columns 2 and 5 are equivalent continuous rating levels and include corrections for tonal character and impulsiveness of the noise and the time of day.						
b The values given in columns 3, 4, 6 and 7 are equivalent continuous rating levels and include corrections for tonal character and impulsiveness.						

The probable community/group response to levels in excess of the acceptable rating levels are presented in Table 3-2, where LReq,T is the equivalent continuous A-weighted sound pressure level, in decibels (dBA), determined over a specific time period. 'A-weighted' is a standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

Table 3-2: Categories of community/group response (SANS 10103, 2008)

Excess ($\Delta L_{Req,T}$)[a]dBA	Estimated community/group response	
	Category	Description
0 – 10	Little	Sporadic complaints
5 – 15	Medium	Widespread complaints
10 - 20	Strong	Threats of action
>15	Very strong	Vigorous action
NOTE Overlapping ranges for the excess values are given because a spread in the community reaction might be anticipated.		
a $\Delta L_{Req,T}$ should be calculated from the appropriate of the following:		
1) $\Delta L_{Req,T} = L_{Req,T}$ of ambient noise under investigation MINUS LReq,T of the residual noise (determined in the absence of the specific noise under investigation);		
2) $\Delta L_{Req,T} = L_{Req,T}$ of ambient noise under investigation MINUS the maximum rating level for the ambient noise given in table 1;		

Excess ($\Delta L_{Req,T}$)[a]dBA	Estimated community/group response	
	Category	Description
3) $\Delta L_{Req,T}$ = $L_{Req,T}$ of ambient noise under investigation MINUS the typical rating level for the applicable district as determined from table 2; or		
4) $\Delta L_{Req,T}$ = Expected increase in $L_{Req,T}$ of ambient noise in an area because of a proposed development under investigation.		

3.2 Fieldwork

No field work was undertaken due to comprehensive baseline data available from the initial Platreef noise impact assessment, undertaken in 2013 (refer to Section 5 for the baseline results).

3.3 Noise Propagation Modelling

Predictive modelling was performed for the proposed activities through the use of the modelling software SoundPlan. The software specialises in computer simulations of noise pollution dispersion. Estimates of the cumulative mining noise levels from the study were derived from the noise emissions from all the major noise-generating components and activities of the Project.

The following table indicates the noise power levels used in the model simulations. The sound power levels were derived from a number of previous studies in the industry.

Table 3-3: Sound power levels from main noise causing sources

Noise source	Sound power levels dB						
Octave band frequencies, Hz	63	125	250	500	1000	2000	4000
Construction phase							
Haul Truck	108	118	115	114	110	106	102
Excavators	113	117	107	108	106	101	95
Front end Loader	108	116	107	108	105	99	95
Drill	109	118	113	113	113	112	110
Dozer	110	122	113	114	110	108	104
Diesel Generator	105	120	116	108	107	108	108
Operational phase							
Processing plant (cumulative including milling operation)	108	106	107	103	99	94	86
Vent Raises	117	114	116	110	108	107	104

Noise source	Sound power levels dB						
Haul Truck	108	118	115	114	110	106	102
Dozer	110	122	113	114	110	108	104

The noise dispersion modelling software was used to assess whether the noise from the proposed project activities will impact on the relevant noise sensitive receivers, by comparing the predicted propagating noise levels with the current ambient baseline noise levels.

According to the National Noise Control Regulations "disturbing noise" means a noise level which exceeds the zone sound level or, if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more. The results of the noise dispersion modelling are presented on Plan 2 – Plan 4 in Appendix B. Assumptions and Limitations.

The following assumptions and limitations are included as part of this assessment:

- The construction phase is assumed to be carried out during daytime hours (06:00-22:00), therefore only daytime scenarios were modelled for the construction phase.
- The resulting noise contours represent worst case L_{Aeq} at any receiver located 360 degrees in the horizontal plane around the noise sources. The noise modelling software is limited to calculating the predominant wind direction (or downwind conditions of propagation) per single receptor only. Calm wind conditions have therefore been included in the model due to the number of surrounding receptors. Thus, the noise dispersion plots do not represent a typical seasonal scenario in the predominant wind direction but rather a yearly average of the area's meteorological conditions in all directions; and
- The noise barrier effectiveness of the waste rock berm at 10 m has been included into the modelling scenarios.

4 Baseline Environment

The initial baseline noise monitoring was undertaken in 2011 during the initial EIA. The data is deemed to be relevant for the addendum project as the land use type and main sound producing activities in the area have not changed. The results from the noise meter recordings for all the sampled points as well as the rating limits according to the SANS 10103:2008 guidelines are presented in Table 4-1. The locations of the monitoring points can be viewed in Plan 1.

Table 4-1: Results of baseline noise measurements

Sample ID	SANS rating limit			Measurement details		
	Type of district	Period	Acceptable rating level dBA	$L_{Areq,T}$ dBA	Maximum/Minimum dBA	Date
Plat 1	Suburban	Daytime	50	48	75 / 36	07/11/2011
		Night time	40	44	65 / 41	07/11/2011
Plat 2	Suburban	Daytime	50	47	75 / 33	08/11/2011
		Night time	40	43	66 / 27	08/11/2011
Plat 3	Suburban	Daytime	50	46	73 / 32	09/11/2011
		Night time	40	45	64 / 36	09/11/2011
Plat 4	Suburban	Daytime	50	51	79 / 33	10/11/2011
		Night time	40	52	70 / 30	10/11/2011
Plat 5	Suburban	Daytime	50	47	71 / 37	11/11/2011
		Night time	40	45	68 / 33	11/11/2011
Plat 6	Suburban	Daytime	50	28	80 / 20	22/08/2013
		Night time	40	27	65 / 20	22/08/2013
	Indicates $L_{Aeq,T}$ levels above either the daytime rating limit or the night time rating limit					

4.1 Plat 1

The measurement was taken in the Masodi community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

4.2 Plat 2

The measurement was taken in the Ga-Madiba community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

4.3 Plat 3

The measurement was taken in the Ga-Kgobudi community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

4.4 Plat 4

The measurement was taken in the Ga-Magongoa community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured above the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts. Ambient day time noise levels are characterised by the intermittent noise from the livestock (roosters crowing) at this location.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

4.5 Plat 5

The measurement was taken in the Boloi community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured above the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts. The ambient night time noise levels are characterised by the continuous noise from the *Gryllidae sp* (crickets) at this location.

4.6 Plat 6

The measurement was taken in the Molekana community. Based on the daytime results from the noise measurements it is noted that the Leq levels measured below the SANS guidelines for the maximum allowable outdoor daytime limit for ambient noise in suburban districts.

The night time ambient Leq levels measured below the SANS guidelines for the maximum allowable outdoor limit for night time ambient noise in suburban districts.

The noise sources that were influencing the baseline measurements at the time of the noise survey and that were responsible for the day/night time measurements are summarised in Table 4-2.

Table 4-2: Summary of noise sources influencing baseline measurements around the proposed site

Noise source description				
ID	**Day**	**Duration**	**Night**	**Duration**
Plat 1	Vehicular traffic (did not cause noise levels to measure above SANS guideline)	Continuous	*Gryllidae sp* (crickets)	Continuous
Plat 2	Vehicular traffic (did not cause noise levels to measure above SANS guideline)	Intermittent	*Gryllidae sp* (crickets)	Continuous
Plat 3	Vehicular traffic (did not cause noise levels to measure above SANS guideline)	Intermittent	*Gryllidae sp* (crickets)	Continuous
Plat 4	Livestock (roosters crowing)	Intermittent	*Gryllidae sp* (crickets)	Continuous
Plat 5	Vehicular traffic (did not cause noise levels to	Continuous	*Gryllidae sp* (crickets)	Continuous

Noise source description				
ID	**Day**	**Duration**	**Night**	**Duration**
	measure above SANS guideline)			
Plat 6	Vehicular traffic (did not cause noise levels to measure above SANS guideline)	Intermittent	*Gryllidae sp* (crickets)	Continuous

5 Sensitivity Analysis and No-Go Areas

In terms of the current project location and infrastructure layout it is not expected that there are any noise sensitive or 'No-Go' areas within the project's current fence line. The reason for this is that the development of the project is within the fenced off mine area and that the planned 10 m waste rock berm will aid in the attenuation of noise from the proposed mining activities.

6 Impact Assessment

6.1 Methodology

The impacts are assessed based on the impact's magnitude as well as the receiver's sensitivity, culminating in an impact significance which identifies the most important impacts that require management.

Based on international guidelines and South African legislation, the following criteria are taken into account when examining potentially significant impacts:

- Nature of impacts (direct/indirect, positive/ negative);
- Duration (short/medium/long-term, permanent(irreversible) / temporary (reversible), frequent/seldom);
- Extent (geographical area, size of affected population/habitat/species);
- Intensity (minimal, severe, replaceable/irreplaceable);
- Probability (high/medium/low probability); and
- Possibility to mitigate, avoid or offset significant adverse impacts.

Details of the impact assessment methodology used to determine the significance of physical, bio-physical and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

Significance = Consequence x Probability x Nature

Where

Consequence = Intensity + Extent + Duration

And

Probability = Likelihood of an impact occurring

And

Nature = Positive (+1) or negative (-1) impact

Note: In the formula for calculating consequence, the type of impact is multiplied by +1 for positive impacts and -1 for negative impacts

The matrix calculates the rating out of 147, whereby Intensity, Extent, Duration and Probability are each rated out of seven as indicated in Table 6-3. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation measure proposed in this EIA/EMP Report. The significance of an impact is then determined and categorised into one of eight categories, as indicated in Table 6-2, which is extracted from Table 6-1. The description of the significance ratings is discussed in Table 6-3.

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, i.e. there may already be certain types of mitigation measures included in the design (for example due to legal requirements). If the potential impact is still considered too high, additional mitigation measures are proposed.

Table 6-1: Impact Assessment Parameter Ratings

Rating	Intensity/Replacability		Extent	Duration/Reversibility	Probability
	Negative impacts	Positive impacts			
7	Irreplaceable damage to highly valued items of great natural or social significance or complete breakdown of natural and / or social order.	Noticeable, on-going natural and / or social benefits which have improved the overall conditions of the baseline.	International The effect will occur across international borders.	Permanent: The impact is irreversible, even with management, and will remain after the life of the project.	Definite: There are sound scientific reasons to expect that the impact will definitely occur. >80% probability.
6	Irreplaceable damage to highly valued items of natural or social significance or breakdown of natural and / or social order.	Great improvement to the overall conditions of a large percentage of the baseline.	National Will affect the entire country.	Beyond project life: The impact will remain for some time after the life of the project and is potentially irreversible even with management.	Almost certain / Highly probable: It is most likely that the impact will occur. <80% probability.
5	Very serious widespread natural and / or social baseline changes. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	Province/ Region Will affect the entire province or region.	Project Life (>15 years): The impact will cease after the operational life span of the project and can be reversed with sufficient management.	Likely: The impact may occur. <65% probability.

Rating	Intensity/Replacability		Extent	Duration/Reversibility	Probability
	Negative impacts	Positive impacts			
4	On-going serious natural and / or social issues. Significant changes to structures / items of natural or social significance.	Average to intense natural and / or social benefits to some elements of the baseline.	Municipal Area Will affect the whole municipal area.	Long term: 6-15 years and impact can be reversed with management.	Probable: Has occurred here or elsewhere and could therefore occur. <50% probability.
3	On-going natural and / or social issues. Discernible changes to natural or social baseline.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	Local Local extending only as far as the development site area.	Medium term: 1-5 years and impact can be reversed with minimal management.	Unlikely: Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur. <25% probability.
2	Minor natural and / or social impacts which are mostly replaceable. Very little change to the baseline.	Low positive impacts experience by a small percentage of the baseline.	Limited Limited to the site and its immediate surroundings.	Short term: Less than 1 year and is reversible.	Rare / improbable: Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures. <10% probability.
1	Minimal natural and / or social impacts, low-level replaceable damage with no change to the baseline.	Some low-level natural and / or social benefits felt by a very small percentage of the baseline.	Very limited Limited to specific isolated parts of the site.	Immediate: Less than 1 month and is completely reversible without management.	Highly unlikely / None: Expected never to happen. <1% probability.

Table 6-2: Probability/Consequence Matrix

		Significance																																						
Probability	7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
	6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
	5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
	4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
	3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
	2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
	1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		Consequence																																						

Table 6-3: Significance Rating Description

Score	Description	Rating
109 to 147	A very beneficial impact that may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the (natural and / or social) environment	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the natural and / or social environment	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the natural and / or social environment	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural and / or social environment	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the natural and / or social environment	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the (natural and / or social) environment and result in severe effects	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts are likely to be irreversible and/or irreplaceable.	Major (negative)

6.2 Impact Assessment

6.2.1 Construction Phase

6.2.1.1 Impact Description

The Construction Phase involves the following activities that may impact on the ambient noise levels:

- Mine development: Headgear, sinking shafts and vent raises;
- Construction of access/haul roads and storm water drains/berms; and
- Distribution of power using diesel generators (<10 MW).

The noise dispersion model run for the construction phase (refer to Plan 2 in Appendix B) indicates that the expected noise will measure above the pre-mining baseline at the surrounding communities by 7dBA or more but mainly impact on the encroached areas.

Table 6-4: Pre-Mitigation and Post-Mitigation Significance Ratings for Impacts on Noise during the Construction Phase

Dimension	Rating	Motivation	Significance
Activity and Interaction (Site clearance and vegetation removal as well as construction of headgear, shaft, haul roads, storm water drain, pipeline and booster pump station			
Impact Description: Noise will emanate from the machinery and vehicles operating during the construction activities such as development of headgear and shaft as well as power generation by the on-site generator.			
Prior to mitigation/ management			
Duration	Medium term (3)	Noise will be produced for the duration of the construction phase	Minor (negative) – 66
Extent	Beyond site (4)	It is expected that during construction noise will extend beyond the development site area	
Intensity x type of impact	Serious - negative (-4)	It is expected that during construction noise will have a serious impact	
Probability	Highly probable (6)	It is almost certain that noise will impact on the surrounding receptors	
Nature	Negative		
Mitigation/ Management action			
▪ Restricting construction activities (excluding blasting as part of operational activities) to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Mining related machines and vehicles to be serviced to the designed requirements of the machinery/vehicles to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers;			

Dimension	Rating	Motivation	Significance
▪ Switching off equipment when not in use; and ▪ Limit vehicles and machinery to a practical capacity at the perimeter fence			
Post- mitigation			
Duration	Medium term (3)	Noise will be produced for the duration of the construction phase	Minor (negative) – 36
Extent	Beyond site (4)	It is expected that during construction noise will extend beyond the development site area	
Intensity x type of impact	Minor - negative (-2)	It is expected that during construction noise will have a minor impact	
Probability	Unlikely (4)	Unlikely of noise causing disturbance with mitigation	
Nature	Negative		

6.2.2 Operational Phase

The Operational Phase involves the following activities that may impact on the ambient noise levels:

- Crushing waste rock;
- Hauling: Internal haul roads and access roads;
- Stockpiling: Waste rock berm, waste rock stockpile, high grade and low grade ore;
- Mining processes: Production shaft and vent raises;
- Operation of booster pump station; and
- Generation of power using diesel generators.

The noise dispersion model run for the operational phase day and night time periods (refer to Plan 3 and Plan 4 in Appendix B) indicates that the expected noise will measure above the SANS 10103:2008 day and night time rating levels (50 dBA and 40 dBA) as well as measure above the pre-mining baseline day and night time levels at the surrounding suburban receptors but mainly impact on the encroached areas. Based on the definition of disturbing noise in the Noise Regulations there will be disturbance where the levels reach 7dBA and more above the pre-mining baseline.

The noise levels from the proposed mining activities are expected to measure 7dBA and more above the baseline levels at Ga-Kgobudi, Sekgoboko, Mgongoa, and Ga-Kgobudi 2 (Mzombane), however the noise will not impact on the communities in their entirety. The encroached areas are mainly impacted due to their proximity to the Ivanplats boundary fence. The models indicate the noise levels will be between 55dbA and 60dBA which is between 7dBA and 12dBA higher than the existing baseline. According to the SANS 10103:2008 categories of community/group response guidelines (refer to Table 3-2), there is

likely to be a medium to strong response towards the noise from the mine. The table below presents the impact zones at each community during the day and night time periods pre-mitigation.

Table 6-5: Noise impact zones

Community	Impact zone – distance from boundary fence	
	Daytime	**Night time**
Ga-Kgobudi	500m from western boundary	700m from western boundary
Sekgoboko	140m from northern boundary	190m from northern boundary
Ga-Magongoa	50m from eastern boundary	100m from the eastern boundary
Ga-Kgobudi 2 (Mzombane)	170m from the southern boundary	270m from the southern boundary

Table 6-6: Pre-Mitigation and Post-Mitigation Significance Ratings for Impacts on Noise during the Operational Phase

Dimension	Rating	Motivation	Significance
Activity and Interaction (operational activities such as mining process, hauling, stockpiling and power generation)			
Impact Description: Noise will emanate from the machinery and vehicles operating during the operational phase such as the crushing circuit, hauling of ore on surface, continuous stockpiling and shaping of waste rock dump and over burden stockpiles as well the use of generators.			
Prior to mitigation/ management			
Duration	Project life (5)	Noise will be produced for the duration of the operational phase	Moderate (negative) – 78
Extent	Beyond site (4)	It is expected that during operation noise will extend as far as development site area	
Intensity x type of impact	Serious - negative (-4)	It is expected that during operation noise will have a serious impact	
Probability	Highly probable (6)	It is highly probable that noise will impact on the surrounding receptors	
Nature	Negative		
Mitigation/ Management action			
▪ Locating of diesel generator away from noise sensitive receptors, as well as placing generators on isolation mounts and installation secondary silencers; ▪ Mining related machines and vehicles to be serviced to the designed requirements of the machinery/vehicles to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and			

Dimension	Rating	Motivation	Significance
▪ Switching off equipment when not in use; and ▪ Limit vehicles and machinery to a practical capacity at the perimeter fence			
Post- mitigation			
Duration	Project life (5)	Noise will be produced for the duration of the operational phase	Minor (negative) – 44
Extent	Beyond site (4)	It is expected that during operation noise will extend beyond the development site area.	
Intensity x type of impact	Minor - negative (-2)	It is expected that during operation noise will have a minor impact	
Probability	Unlikely (4)	Unlikely of noise causing disturbance	
Nature	Negative		

6.2.3 Decommissioning Phase

The Decommissioning Phase involves the following activities that may impact on the ambient noise levels:

- Demolition and removal of all infrastructure; and
- Rehabilitation and sealing shafts.

The impact during the decommissioning phase is expected to be lower than both that of the construction and operational phases due to the limited activities, therefore it is probable that the noise from the decommissioning phase will not impact on the surrounding communities.

Table 6-7: Pre-Mitigation and Post-Mitigation Significance Ratings for Impacts on Noise during the Decommissioning Phase

Dimension	Rating	Motivation	Significance
Activity and Interaction (Site clearance and vegetation removal for the CPP, RTSF an pipeline)			
Impact Description: Noise will emanate from the machinery and vehicles operating during the decommissioning activities.			
Prior to mitigation/ management			
Duration	Medium term (3)	Noise will be produced for the duration of the decommissioning phase	Negligible (negative) – 21
Extent	Local (3)	It is expected that during decommissioning noise will extend as far as development site area	
Intensity x type of impact	Minimal - negative (-1)	It is expected that during decommissioning noise will have a minimal impact	

Dimension	Rating	Motivation	Significance
Probability	Unlikely (3)	It is unlikely that noise will impact on the surrounding receptors	
Nature	Negative		
Mitigation/ Management action			
▪ Restricting decommissioning activities to daylight hours (06:00 – 17:00) and not during weekends and public holidays; ▪ Mining related machines and vehicles to be serviced to the designed requirements of the machinery/vehicles to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and ▪ Switching off equipment when not in use; and ▪ Limit vehicles and machinery to a practical capacity at the perimeter fence			
Post- mitigation			
Duration	Medium term (3)	Noise will be produced for the duration of the decommissioning phase	Negligible (negative) – 14
Extent	Local (3)	It is expected that during decommissioning noise will be limited to site if mitigation measures are implemented	
Intensity x type of impact	Minimal - negative (-1)	It is expected that during decommissioning noise will have a minimal social impact	
Probability	Rare (2)	It is improbable that noise will impact on the surrounding receptors.	
Nature	Negative		

7 Unplanned Events and Low Risks

Table 7-1: Unplanned events, low risks and their management measures

Unplanned event	Potential impact	Mitigation/ Management/ Monitoring
Forced construction activities during night	Noise disturbance during night time	Night time monitoring at nearest receptor to establish whether the specific noise from the construction activities are measuring above the rating levels.
Slipping v-belts at booster pump stations	Noise disturbance from high pitched noise created by the slipping belts	Replacement of v-belts when incidence occurs

8 Environmental Management Programme

An Environmental Management Programme Report (EMPr) is a delivery mechanism for the mitigation measures identified and ensures a systematic approach to bringing environmental and social considerations into decision making and day-to-day operations. It establishes a framework for tracking, evaluating and communicating environmental and social performance and helps ensure that environmental risks and liabilities are identified, minimized and managed. The EMPr details the additional mitigation measures Ivanplats will implement throughout the project lifecycle.

The EMPr has been developed to meet national environmental requirements, in particular, the provisions of the NEMA. Ivanplats will, therefore, need to commit to preventing pollution and making resources available to ensure that all reasonable safeguards are in place to do so. In addition, Ivanplats will need to accept accountability and financial liability for any pollution that may occur as a result of project activities.

The EMPr will be a living document, and will continue to develop during the design and construction phase to enable continuous improvement of the Project's social and environmental performance. The EMPr will also be reviewed against changes in the regulatory regime and in the event of new policies or guidelines from the relevant Competent Authorities. Periodic reviews and updating will also be carried out throughout the project lifecycle, to incorporate changes in activities and any changes in the overarching management systems.

The EMPr is intended to cover those activities described in Section 6of this report. It covers project activities during construction, operation and decommissioning.

The ultimate goal of the EMPr is to:

- Incorporate environmental management into project design and operating procedures;
- Serve as an action plan for environmental management for the Project and provide a framework for implementing project environmental commitments (i.e. mitigation measures identified in the EIA);

- Ensure that all workers, subcontractors and others involved in the Project meet legal and other requirements with regard to environmental management;
- Address concerns and issues raised in the EIA's stakeholder consultation process and those that will likely continue to arise during the Project's lifetime; and
- Prepare and maintain records of project environmental performance (i.e. monitoring, audits and non-compliance tracking).

8.1 Project Activities with Potentially Significant Impacts

Table 8-1: Potentially Significant Impacts of the project activities

Aspects	Potential Significant Impacts	Comment
▪ Construction machinery; ▪ Diesel generators; ▪ Haul trucks; ▪ Crushing circuit; ▪ Stockpiling; and ▪ Booster pump station.	*Noise disturbance in the adjacent communities*	Implement specific mitigation measures to minimise impact on adjacent communities

8.2 Summary of Mitigation and Management

Table 8-2 to Table 8-4 provides a summary of the proposed project activities, environmental aspects and impacts on the receiving environment. Information on the frequency of mitigation, relevant legal requirements, recommended management plans, timing of implementation, and roles / responsibilities of persons implementing the EMPr.

Table 8-2: Project Activities Requiring Management

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
Mine development; Construction of haul roads; and Distribution of power	Construction	Noise disturbance will range from 100 m to 700 m from the project boundary	Restricting construction activities (excluding blasting as part of operational activities) to daylight hours (06:00 – 17:00) and not during weekends and public holidays; Switch of vehicles and machinery not in use; Machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and Locating diesel generator away from receptors, as well as placing generators on isolation mounts and installation secondary silencers. ; and; Limit vehicles and machinery to a practical capacity at the perimeter fence.	Mitigation measures will assist in keeping noise levels as low as possible to endeavour to comply with the National Noise Control Regulations	During construction phase
Crushing waste rock; Hauling; Stockpiling; Mining processes; and Power generation	Operational	Noise disturbance will range from 100 m to 700 m from the project boundary	Switch of vehicles and machinery not in use; Machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and Locating diesel generator away from receptors. and; Limit vehicles and machinery to a practical capacity at the perimeter fence.	Mitigation measures will assist in keeping noise levels as low as possible to comply with the National Noise Control Regulations	During operational phase

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
Backfilling; Demolition and Rehabilitation.	Decommissioning	Noise disturbance will range from 100 m to 700 m from the project boundary	Limit decommissioning activities to daylight hours(06:00 – 17:00) and not during weekends and public holidays; Switch of vehicles and machinery not in use; and machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and; Limit vehicles and machinery to a practical capacity at the perimeter fence.	Mitigation measures will assist in keeping noise levels as low as possible to comply with the National Noise Control Regulations	During decommissioning phase

Table 8-3: Potential Impacts and Outcomes of the EMPr

Activities	Potential Impacts	Phase	Mitigation	Standard to be Achieved/Objective
Mine development; Construction of haul roads; and Distribution of power	Noise disturbance	Construction	Restricting construction activities (excluding blasting as part of operational activities) to daylight hours (06:00 – 17:00) and not during weekends and public holidays; Switch off vehicles and machinery not in use; Machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; Locating diesel generator away from receptors, as well as placing generators on isolation mounts and installation secondary silencers; and Limit vehicles and machinery to a practical capacity at the perimeter fence.	To comply with the definition of 'noise disturbance' as described by the National Noise Control Regulations
Crushing waste rock; Hauling; Stockpiling; Mining processes; and Power generation	Noise disturbance	Operational	Switch of vehicles and machinery not in use; Machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; Locating diesel generator away from receptors; and Limit vehicles and machinery to a practical capacity at the perimeter fence.	To comply with the definition of 'noise disturbance' as described by the National Noise Control Regulations

Activities	Potential Impacts	Phase	Mitigation	Standard to be Achieved/Objective
Backfilling; Demolition and Rehabilitation.	Noise disturbance	Decommissioning	Limit decommissioning activities to daylight hours(06:00 – 17:00) and not during weekends and public holidays; Switch of vehicles and machinery not in use; and machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and Limit vehicles and machinery to a practical capacity at the perimeter fence.	To comply with the definition of ‘noise disturbance’ as described by the National Noise Control Regulations

Table 8-4: Proposed Mitigation and Management Measures

Activities	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
Mine development; Construction of haul roads; and Distribution of power	Noise	Noise disturbance in the adjacent communities	Restricting construction activities (excluding blasting as part of operational activities) to daylight hours (06:00 – 17:00) and not during weekends and public holidays; Switch of vehicles and machinery not in use; Machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; Locating diesel generator away from receptors, as well as placing generators on isolation mounts and installation secondary silencers; and Limit vehicles and machinery to a practical capacity at the perimeter fence.	Upon commencement of construction phase	To comply with the definition of ‘noise disturbance’ as described by the National Noise Control Regulations

Activities	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
Crushing waste rock; Hauling; Stockpiling; Mining processes; and Power generation	Noise	Noise disturbance in the adjacent communities	Switch of vehicles and machinery not in use; Machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; Locating diesel generator away from receptors; and Limit vehicles and machinery to a practical capacity at the perimeter fence.	Upon commencement of operational phase	To comply with the definition of 'noise disturbance' as described by the National Noise Control Regulations
Backfilling; Demolition and Rehabilitation.	Noise	Noise disturbance in the adjacent communities	Limit decommissioning activities to daylight hours(06:00 – 17:00) and not during weekends and public holidays; Switch of vehicles and machinery not in use; and machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers; and; Limit vehicles and machinery to a practical capacity at the perimeter fence.	Upon commencement of decommissioning phase	To comply with the definition of 'noise disturbance' as described by the National Noise Control Regulations

Table 8-5: Prescribed Environmental Management Standards, Practice, Guideline, Policy or Law

Applicable Standard, Practice, Guideline, Policy or Law		
Title	**Description of Requirements**	**Relevance to Project**
Legislation (National, Provincial, Local)		
National Noise Control Regulations, R.154 (10 January 1992) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989)	Applicable to national, provincial and local level	Regulating the projects compliance in terms of noise impact
Applicable Guideline/Standards		
SANS 10103:2008	Gives guidelines to the measurement and rating of environmental noise with respect to annoyance and to speech communication	Provides guidelines to noise monitoring and impact rating of the projects noise impact

9 Monitoring Programme

Ivanplats will be responsible for the implementation of all monitoring actions. The recommended monitoring actions for the identified impacts are detailed below. Ivanplats will also be responsible for keeping a record of all environmental monitoring undertaken for the Project.

Ivanplats is currently implementing a quarterly noise monitoring programme, which started March 2015. The current monitoring programme is already carried out in accordance with the table below.

Monitoring objectives	***Parameters to be monitored***	***Location/Sampling Point***	***Frequency***
Determine whether the noise produced by the mining activities are impacting on the surrounding communities	The L_{Aeq} levels of the monitoring should measure within +7dBA of the pre-mining baseline levels for each surrounding community	The current monitoring locations should be used for the remainder of the monitoring programme	Quarterly

10 Relevant Stakeholder Consultation

No consultation was undertaken due to the fact that no site visit was carried out for the amendment process as it was not necessary.

11 Relevant Comments and Responses

Relevant comments and responses will be included as soon as they are received.

12 Conclusion and Recommendation

It is concluded that the proposed amendments and its associated activities are expected to cause a noise disturbance as contemplated in the Noise Regulations at the surrounding communities of Ga-Kgobudi, Sekgoboko, Ga-Magongoa and Ga-Kgobudi 2 (Mzombane). The noise impact will mainly be on the encroached areas where the mining activities will measure 7dBA and more at certain distances into the encroached areas. According to the SANS 10103:2008 categories of community/group response guidelines (refer to Table 3-2), there is likely to be a medium to strong response towards the noise from the mine. The results of the modelling scenarios already include the noise barrier effectiveness of the 10 m waste rock berm.

The overall calculated severity of the noise impact during the construction, operational and decommissioning phase is minor negative, moderate negative and minor negative respectively.

The significance of the impact from the initial noise assessment compared to the addendum assessment has increased due to the location amendments of infrastructure as well as the result of encroachment by certain surrounding communities.

If the rising of the berm is impractical it is recommended that Ivanplats apply for exemption from provisions of the noise control regulations as per regulation 7, due to the encroachment of certain households that may be impacted by the mining activities. According to regulation 7 “Any person may by means of a written application, in which the reasons are given in full, apply to the local authority concerned for exemption from any provision of these Regulations”.

It is the professional opinion of the author that the project proceed for the reason that it is possible to apply for exemption from provisions of the noise control regulations.

13 Reference List

Environmental Conservation Act (Act 73 of 1989). *National Noise Control Regulations. RN 154/1992.*

South African National Standard - Code of practice, SANS 10103:2008, Edition Six, *The measurement and rating of environmental noise with respect to annoyance and to speech communication*. Available [online] http://www.sabs.co.za;

South African National Standard – Code of practice, SANS 101328:2008, *Methods for environmental noise impact assessments*. Available [online] http://www.sabs.co.za;

Appendix A: Declaration of Independence and Specialist CV

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I, Lukas Sadler as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Sibanye Gold Limited, other than fair remuneration for work performed, specifically in connection with the proposed West Rand Tailings Retreatment Project, Gauteng Province.



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Full Name	Lukas Sadler
Title / Position	Environmental Noise Consultant
Qualifications	B.COM Environmental Management
Experience (Years)	7
Registration	N/A

LUKAS SADLER

Mr. Lukas Sadler

Environmental Consultant

Noise Unit

Digby Wells Environmental (Pty) Ltd

1 EDUCATION

2014:	Noise and Vibration Fundamentals Assessment & Application Workshop
2013:	Course in Environmental Noise Control
2010:	Short course in Air Quality Management (University of Johannesburg)
2009:	Short course in Occupational and Environmental Noise
2002 – 2004:	BCom Environmental Management (North West University)

2 EMPLOYMENT

November 2007 - Present:	Digby Wells Environmental
May 2006 – July 2007:	West View Rail (Pty) Ltd (London)

3 EXPERIENCE

During my two year stay in London from September 2005 – September 2007, I worked for West View Rail (Pty) Ltd on the London Underground Railway doing reconstruction of the rail.

I am currently working at Digby Wells Environmental in the Environmental Noise Unit, where I am responsible for the Noise Impact Assessments relating to EIA/EMP's, as well as assisting with the compilation of reports such as environmental impact assessments. This includes experience working with projects in accordance with the International Finance Corporation (IFC) and World Bank standards, in countries such as Namibia, Mali, Senegal, Ghana, Mozambique Liberia, DRC, Sierra Leone and Cameroon.

My core focus is working on Environmental Noise Impact Assessments, which includes the assessment, remediation and management of impacts related to noise nuisance for the construction, mining and petrochemical industry.

Further responsibilities and experience gained at Digby Wells Environmental currently include, but are not limited to:

- Assisting with the compilation of EIA's and EMP's; and
- Noise monitoring (baseline as well as continuous compliance monitoring).

4 PROJECT EXPERIENCE

Noise Impact Assessments:

Boikarabelo Colliery – RSA

Putu Iron Ore Project – Liberia

New Liberty Gold Mine – Liberia

Thabametsi Colliery – RSA

Temo Coal Project – RSA

Cooke Uranium Project – RSA

Kibali Gold Project - DRC

Sadiola ESIA – Mali

Mmamabula Optimisation Project - Botswana

Koidu – Sierra Leone

Msobo, Harwar Project – South Africa

Msobo, Consbrey Project – South Africa

Dust Monitoring Experience:

Mashala Resources – South Africa

Anglo Gold Ashanti Iduapriem Mine – Ghana

Eastplats – South Africa

Universal Coal – South Africa

5 PROFESSIONAL AFFILIATIONS

The National Association for Clean Air (NACA)

Appendix B: Noise Modelling Plans

Plan 1: Noise Monitoring Locations

Plan 2: Construction Phase Noise Dispersion

Plan 3: Daytime Operational Phase Noise Dispersion

Plan 4: Night time Operational Phase Noise Dispersion

Plan 1

Ivanplats (Pty) Ltd

Noise Monitoring Locations

Legend

- Noise Monitoring Locations
- Mining Right Area
- Infrastructure Area
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland

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Central Meridian: 29°E	Date: 18/12/2015

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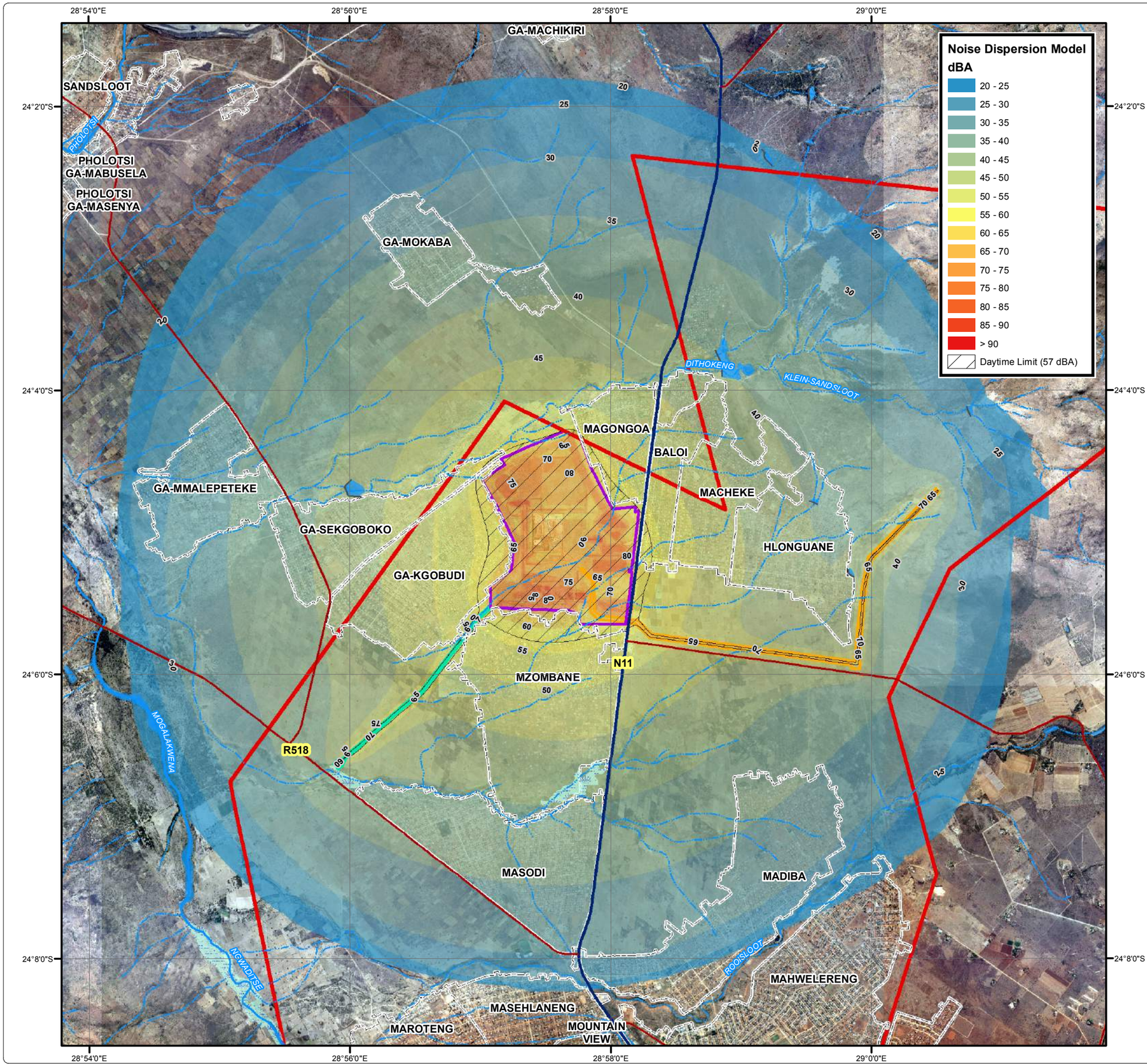
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Plan 2

Ivanplats (Pty) Ltd

Noise Dispersion Model Construction Phase (Daytime)



Legend

- Mining Right Area
- Infrastructure Area
- Stormwater Drain Servitude
- TSF Pipeline Servitude
- Arterial / National Route
- Main Road
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Residential Area

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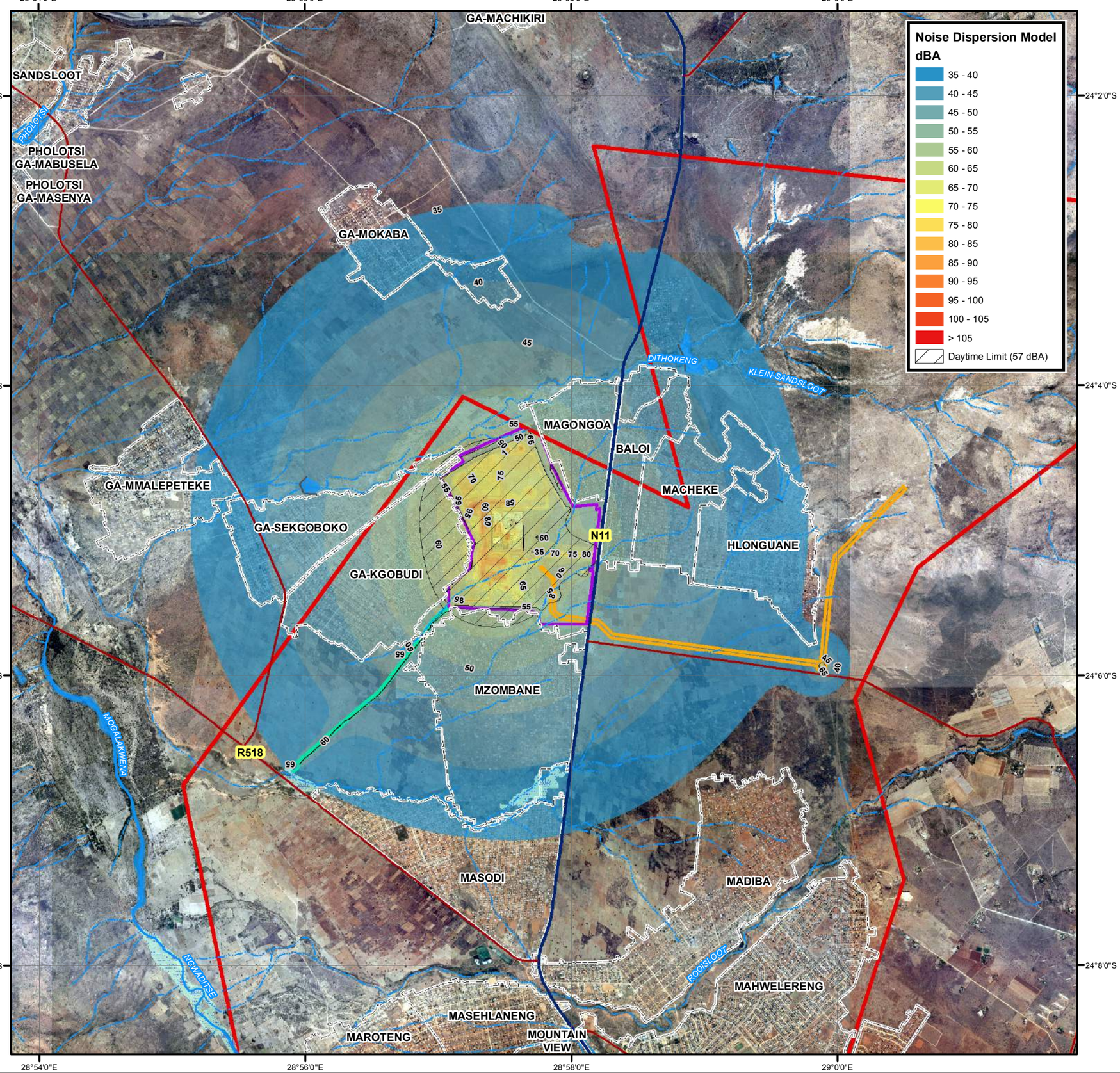
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Plan 3

Ivanplats (Pty) Ltd

Noise Dispersion Model Operational Phase (Daytime)



Legend

- Mining Right Area
- Infrastructure Area
- Stormwater Drain Servitude
- TSF Pipeline Servitude
- Arterial / National Route
- Main Road
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Residential Area

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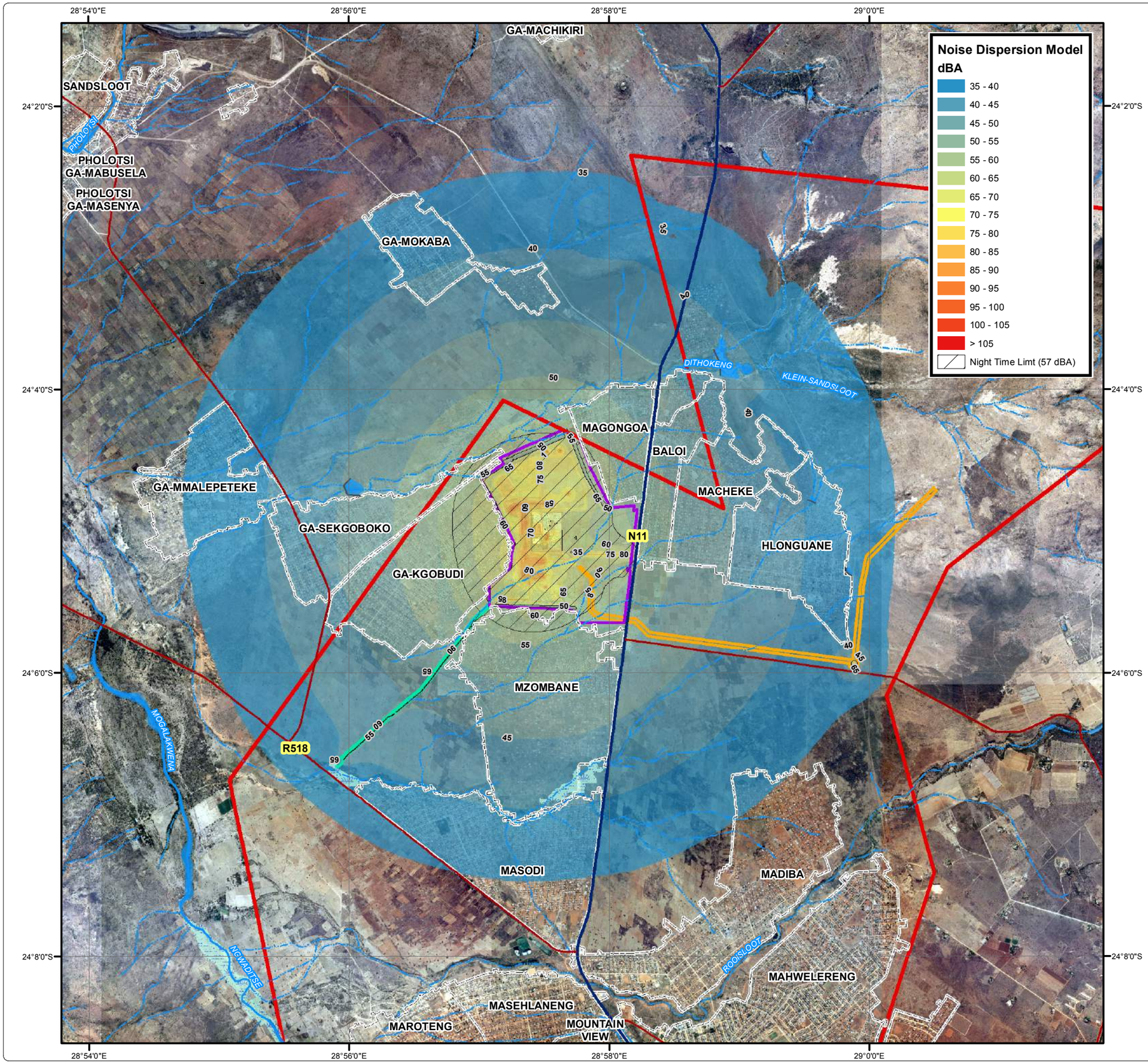
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Plan 4

Ivanplats (Pty) Ltd

Noise Dispersion Model Operational Phase (Night Time)



Legend

- Mining Right Area
- Infrastructure Area
- Stormwater Drain Servitude
- TSF Pipeline Servitude
- Arterial / National Route
- Main Road
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam / Lake
- Wetland
- Residential Area

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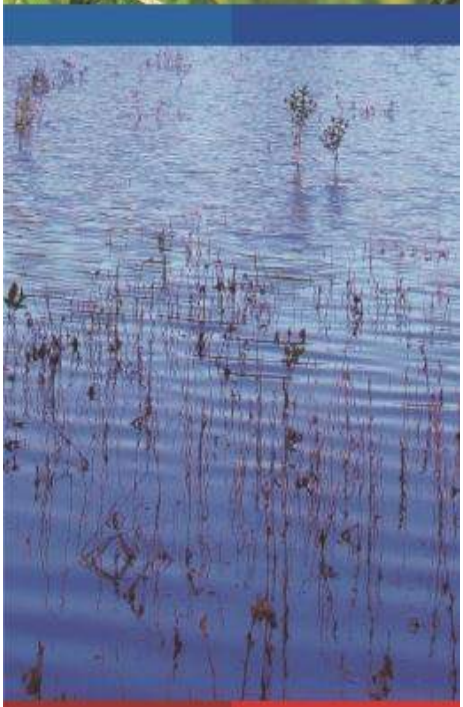
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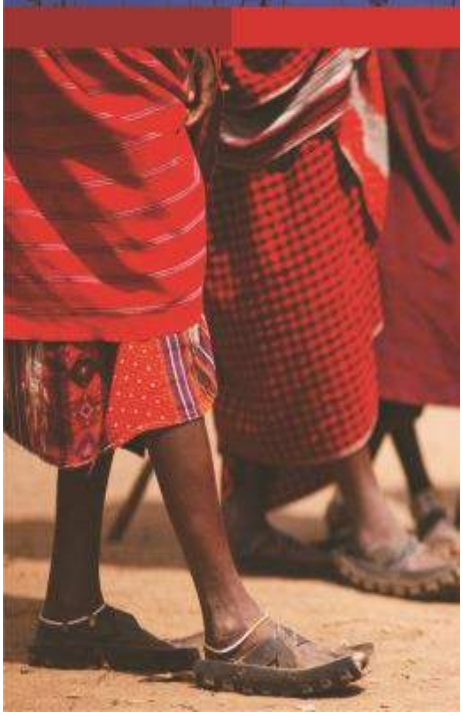
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Appendix I: Addendum Rehabilitation Impact Assessment Report







DIGBY WELLS
ENVIRONMENTAL

Addendum to the Environmental Impact Assessment Report for the Proposed Platreef) Underground Mine, near Mokopane, Limpopo Province

Rehabilitation Impact Assessment Addendum Report

Project Number:

IVA3396

Prepared for:

Ivanplats (Pty) Ltd

January 2016

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*Non-Executive

This document has been prepared by Digby Wells Environmental.

Report Type:	**Rehabilitation Impact Assessment Addendum Report**
Project Name:	**Addendum to the Environmental Impact Assessment Report for the Proposed Platreef) Underground Mine, near Mokopane, Limpopo Province**
Project Code:	**IVA3396**

Name	Responsibility	Signature	Date
Brett Coutts	Report Compiler		January 2016
Lucy Koeslag	Exco Reviewer		January 2016

This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.

EXECUTIVE SUMMARY

Introduction and Project Background

Ivanplats (Pty) Ltd (hereafter Ivanplats) (formenly Platreef Resources (Pty) Ltd) wishes to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (the Project).

The Project is located on the Northern Limb of the Bushveld Igneous Complex (BIC), approximately 280 km northeast of Johannesburg and 8 km northwest of the town of Mokopane (formerly known as Potgietersrus) in the Limpopo Province of South Africa. The Project is located on the farms Macalacaskop 243 KR and Turfspruit 241 KR with the construction of a Tailings Storage Facility (TSF) on the farm Rietfontein 2 KS.

As a result in changes to the original infrastructure layout, an amendment to the Environmental Authorisation that was granted to Ivanplats by the Limpopo Economic Development, Environment and Tourism (LEDET) on 27 June 2014 with Environmental Authorisation Number: 12/1/9/2-W32, is being sought. The competent authority for consideration of this amendment is the Department of Mineral Resources (DMR).

Digby Wells Environmental has been appointed by Ivanplats to review these changes to the infrastructure layout and identify and assess any additional impacts that may result from these changes. This rehabilitation specialist report therefore serves as an addendum to the existing specialist report compiled for the Platreef Project (Conceptual Rehabilitation Plan for the Proposed Platreef Underground Mine, October 2013).

Terms of Reference

It is widely recognised that landscape rehabilitation, post mining is essential to reinstate a functional end land use which positively contributes towards the future biophysical and societal demands of the people and fauna living in proximity to a disturbed environment. Mining activity in South Africa has a legacy of poor rehabilitation post extraction although this has changed substantially in recent years due to legislation, enforcement and environmentally responsible practices being implemented by the mining industry.

Aims and Objectives

The objective of the rehabilitation plan is to ensure activities associated with the infrastructure located within the mining footprint area will be designed to prevent, minimise or mitigate adverse long-term environmental and social impacts and create a self-sustaining ecosystem. The original rehabilitation plan identified the following objectives:

- Re-establishment of the pre-mining land capability to allow for a suitable post mining land use;
- Maintain and minimise impacts to the functioning wetlands and waterbodies within the area;

- Implement progressive rehabilitation measures where possible (i.e. contractors camps and areas used during the construction phase)
- Prevent soil, surface water and groundwater contamination;
- Comply with the relevant local and national regulatory requirements; and
- Maintain and monitor the rehabilitated areas.

The above mentioned rehabilitation and closure objectives set out in the original rehabilitation plan are still applicable notwithstanding the changes proposed to the mine infrastructure and layout.

Rehabilitation and Closure Planning

It is important that a post closure vision is defined from the outset. Workshops and Toolbox Talks are methodologies in which this vision is discussed and defined:

"Rehabilitation of the site must be geared towards leaving an environment that is stable and acceptable to the regulators and to ensure that the land can be utilised post closure"

According to the Chamber of Mines Guidelines for the rehabilitation of mined land 'effective rehabilitation', is defined as *"rehabilitation that will be sustainable, in the long term, under normal land management practices*" (Chamber of Mines, 2007; Department of Minerals and Energy, 2008). Mine rehabilitation therefore must be considered as an on-going process aimed at restoring the physical, chemical and biological quality or potential of air, land and water regimes disturbed by mining to a state acceptable to the regulators and to post mining land users (Whitehorse Mining Initiative, 1994).

Annual rehabilitation planning and monitoring is now a legal requirement and the holder of a mining right will be required to:

- Review concurrent rehabilitation and remediation activities already implemented;
- Establish rehabilitation and remediation goals and outcomes for the forthcoming 12 months in line with the outcomes of the final mine closure plan;
- Establish a plan, schedule and budget for rehabilitation for the forthcoming 12 months;
- Identify and address shortcomings experienced in the preceding 12 months of rehabilitation; and
- Evaluate and update the closure costs.

It is recommended that rehabilitated land should be reconstructed to pre-mining grazing within the areas where surface infrastructure will be. This addendum excludes the Tailings Storage Facility (TSF). For further detail regarding the TSF refer to the Conceptual Rehabilitation Plan for the Proposed Platreef Underground Mine (Digby Wells, October 2013).

With the evolution of the closure and rehabilitation plan, the post-mining use of the mining infrastructure needs to be evaluated and determined whether or not it will support the mine's vision and to ensure that if infrastructure remains that it can be utilised post closure (excluding the TSF).

In instances where surface infrastructure remains post closure, the mine must ensure that it could be used sustainably by local communities. If there is no sustainable use for mine infrastructure it is recommended that such infrastructure rather be demolished to avoid it being vandalized (excluding the TSF).

When utilising soil for rehabilitation purposes the following should be avoided if possible:

- Contamination impacts on soil quality;
- Erosion impacts on soil volume;
- Incorrect storage and handling of soil, leading to a deterioration in soils quality
- Indiscriminate storage impacts on soil quality; and
- Utilising soil for other purposes, other than rehabilitation, leading to impacts on soil volume (loss of soil as a resource).

The following steps should be followed during infrastructure removal:

- Identify infrastructure items that may be of use to the future land users;
- In association with those users and the authorities, define what could be left, how it would be used and how sustainable that use would be;
- The remaining infrastructure should be assessed for its suitability for re-use/recycling;
- The re-usable items should be removed from the site;
- Hazardous material locations and deposits require specialised assessment and analysis to determine how these materials should be decontaminated and to ensure that all residual hazardous materials are disposed of at licensed hazardous waste disposal facilities;
- Mining infrastructure that will be left on site must be rendered safe;
- Remaining structures should be demolished and the demolition rubble removed;
- The final landform agreed for the infrastructure areas should be created; and
- Soil should be replaced on the disturbed area and re-vegetated.

The report provides specific measures associated with the rehabilitation of the following infrastructure (Refer to Appendix B for the infrastructure plan):

- Mine development: Headgear, Sinking of Shafts and Vent Raises;
- Access and haul roads and stormwater drains/berms;

- Powerlines and substations (< 33kV) and generation of power using diesel generators (10MW);
- Crushing and Screening Operations;
- Stockpiling: waste rock berm, waste rock stockpiles, high and low grade ore;
- Water management infrastructure; and
- Demolition and removal of all infrastructure.

Once the site has been cleared of all removable infrastructure (excluding infrastructure identified for future use) and rubble the exposed underlying materials should be reshaped to create a gently sloping, free-draining topography. The topsoil and sub soil that was removed during the construction phase should be replaced (as the final top layer), fertilised and ripped. In cases where the foundations of the structures are impractical to remove, the foundations should be covered with a combination of soft overburden or B horizon material topped with a layer of topsoil, which should be at least 1 m thick (700 mm of B horizon and 300 mm of topsoil). After these tasks have been completed the infrastructure sites can be included in the rehabilitation process for re-vegetation, monitoring and maintenance.

It is recommended that rehabilitated land should be reconstructed to pre-mining grazing capabilities within the areas where surface infrastructure will be. This addendum excludes the Tailings Storage Facility (TSF). For further detail regarding the TSF refer to the Conceptual Rehabilitation Plan for the Proposed Platreef Underground Mine (Digby Wells, October 2013).

The rehabilitation “seed cocktails” generally consist of grasses as they rapidly establish and provide excellent protection against surface erosion. The area has a relatively low rainfall with evaporation often 4 times higher than rainfall on an annual basis. Soils are mostly sandy and do not retain water well. Given the extreme conditions, self-seeding and **stoloniferous** grasses have been suggested.

Monitoring and Maintenance

The purpose of monitoring is to ensure that the rehabilitation objectives are met and that the rehabilitation process is followed. The physical aspects of rehabilitation should be carefully monitored as well as during the progress of establishment of desired final ecosystems.

The following items should be monitored whilst rehabilitation activities are being performed:

- Alignment of actual final topography to agreed planned landform (surveyor's records);
- Depth of topsoil stripped and placed (surveyor's records);
- Chemical, physical and biological status of replaced soil (soil analyses);
- Erosion status (visual observations and records);
- Surface drainage systems and surface water quality at agreed locations (surface water assessments);
- Groundwater quality at agreed locations (groundwater assessments);
- Vegetation basal cover (fauna and flora monitoring);
- Vegetation species diversity (fauna and flora monitoring);
- Faunal re-colonisation (Sherman and pitfall trapping) (fauna and flora monitoring); and
- Proportion of mined land that has been fully rehabilitated (rehabilitation monitoring).

Monitoring of surface and groundwater resources as well as air quality (dust sampling) should take place on a monthly basis for the first 12 months after rehabilitation has been completed. Aquatic ecosystems should be monitored bi-annually i.e. once during the wet season and once during the dry season. After the first 12 months of monitoring the frequency of sampling should be adjusted to quarterly monitoring for the surface and groundwater resources. Aquatic ecosystems should still be monitored on a bi-annual basis and dust sampling should be undertaken on a monthly basis. This monitoring should continue for an additional 36-48 months.

Conclusion

The overall objective of the rehabilitation plan and addendum is to ensure activities associated with the infrastructure within the mining footprint area will be designed to prevent, minimise or mitigate adverse long-term environmental and social impacts and create a self-sustaining ecosystem.

This report must be considered as a living document and is required to be updated on an annual basis with respect to the legislative requirements which have come into effect.

In terms of recommendations the following was made in the original report compiled and remain unchanged:

- It is recommended that the financial provision for closure and rehabilitation be annually updated as per legislative requirements outlined in GN R 1147 (GG 39425 of 20 November 2015);
- Site infrastructure:

- Long term management of the rehabilitated areas will be required via contractual agreements with land owners in the area;
- Rehabilitation should also be undertaken to best practise and taking into account legal requirements.

- Regular audits should be undertaken to monitor the progress of areas that have been rehabilitated for a period of 3-4 years at a minimum;
- Regular audits should be undertaken by a soil scientist during the soil stripping process. This will guarantee that soils are stripped and stockpiled correctly; and
- Surface water and groundwater monitoring should be undertaken to determine the impacts associated with operations of the proposed mine.

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Appendix B: Infrastructure Plan

1 Introduction

1.1 Project Background

Ivanplats (Pty) Ltd (hereafter Ivanplats) (formerly Platreef Resources (Pty) Ltd) plan to develop and operate an underground platinum mine and associated infrastructure, near Mokopane, Limpopo Province (the Project).

The Project is located on the Northern Limb of the Bushveld Igneous Complex (BIC), approximately 280 km northeast of Johannesburg and 8 km northwest of the town of Mokopane (formerly known as Potgietersrus) in Limpopo Province of South Africa. The Project is located on the farms Macalacaskop 243 KR and Turfspruit 241 KR with the construction of a Tailings Storage Facility (TSF) on the farm Rietfontein 2 KS.

Ivanplats is the holder of a Mining Right with reference LP30/5/2/2//1/10067MR, issued by the Department of Mineral Resources (DMR) on 04 November 2014. Since the granting of this right, Ivanplats has commenced with the sinking of one of the planned mine production shafts (i.e. Shaft 1) as well as the development of certain project infrastructure such as the installation of a mine boundary fence.

Prior to the installation of the mine boundary fence and during site establishment, the planned mine infrastructure area which covered an approximate 420 hectares (ha) was encroached on by surrounding communities. As a result of the encroachment, Ivanplats was required to revise the mine layout plan by amending the footprint and/or location of certain activities/infrastructure, which has now been reduced to 346 ha. It is a 74 ha reduction.

Digby Wells Environmental has been appointed by Ivanplats to review these amendments and identify and assess any additional impacts that may results from these amendments. This rehabilitation specialist report therefore serves as an addendum to the existing specialist report compiled for the Platreef Project (Conceptual Rehabilitation Plan for the Proposed Platreef Underground Mine, Digby Wells, October 2013).

1.2 Terms of Reference

It is widely recognised that landscape rehabilitation, post mining is essential to reinstate a functional end land use which positively contributes towards the future biophysical and societal demands of the people and fauna living in proximity to a disturbed environment. Mining activity in South Africa has a legacy of poor rehabilitation post extraction although this has changed substantially in recent years due to legislation, enforcement and environmentally responsible practices being implemented by the mining industry.

Mine rehabilitation must be considered as an on-going process aimed at restoring the physical, chemical and biological quality or potential of air, land and water regimes disturbed by mining to a state acceptable to the regulators and to post mining land users (Whitehorse Mining Initiative, 1994).

It must be noted that this addendum does not cover all the mining activities and is only applicable to the infrastructure located within the 346 ha mining footprint area that has been altered from the original 420 ha area.

1.3 Aims and Objectives

The objective of the rehabilitation plan is to ensure activities associated with the infrastructure located within the mining footprint area will be designed to prevent, minimise or mitigate adverse long-term environmental and social impacts and create a self-sustaining ecosystem. The original rehabilitation plan identified the following objectives:

- Re-establishment of the pre-mining land capability to allow for a suitable post mining land use;
- Maintain and minimise impacts to the functioning wetlands and waterbodies within the area;
- Implement progressive rehabilitation measures where possible (i.e. contractors camps and areas used during the construction phase)
- Prevent soil, surface water and groundwater contamination;
- Comply with the relevant local and national regulatory requirements; and
- Maintain and monitor the rehabilitated areas.

The above mentioned rehabilitation and closure objectives set out in the original rehabilitation plan are still applicable notwithstanding the changes proposed to the mine infrastructure and layout.

2 Specialist Details

The Rehabilitation Team at Digby Wells is made up of a several well educated professionals in the natural sciences with significant experience on similar mining projects in the Waterberg Coalfield. Relevant details of the specialists involved in this study are described below:

Brett Coutts is an Ecologist with a BSc Honours in Ecology, Environment and Conservation. Brett gained practical hands on experience as a project manager on environmental rehabilitation projects at Hydromulch and his roles and responsibilities include the compilation of Basic Assessment (BA) reports, Scoping & Environmental Impact Reports, compilation of Environmental Management Plans (EMP), GIS mapping and Biodiversity Action Plans linking to rehabilitation. Brett is currently the Unit Manager for the Rehabilitation Department and his roles involve the compilation of rehabilitation plans, undertaking audits and implementation of rehabilitation projects.

Danie Otto is a Botanist with an M.Sc in Environmental Management relating to phytoremediation rehabilitation of tailings facilities. He has written rehabilitation plans for coal, gold, uranium, asbestos operations as well as for smelter slag and waste operations. Danie has implemented, monitored and overseen rehabilitation of wetlands, gold tailings (sloping down, capping and vegetating), asbestos dumps as well as smelter slag dump rehabilitation plans.

3 Methodology

3.1 Rehabilitation and Closure Planning

3.1.1 Legal Requirements

Relevant legislation governing mine rehabilitation, closure cost assessment (closure provision), and closure planning is described in National Environmental Management Act, as Amended (NEMA). Section S24(R)(3) of the NEMA now deals with Mine Closure. This Section states that every holder, holder of an old order right or owner of works must plan, manage and implement such procedures and requirements in respect of the closure of a mine as may be prescribed. In support of this is Regulation GN R 982, which provides the substantive content requirements for closure and rehabilitation plans. In addition, the Financial Provisioning Regulations, 2015 were published under GN R 1147 (GG 39425 of 20 November 2015) and are now in operation. The Financial Provisioning Regulations are applicable to rehabilitation and closure plans as they prescribe the minimum content of an “annual rehabilitation plan” and the minimum content of a “final rehabilitation, decommissioning and mine closure plan”.

The rehabilitation plan will be relevant for a period of 1 year, after which the plan will be updated by the holder of a right or permit to reflect progress relating to rehabilitation and remediation activities in the preceding 12 months and to establish a plan, schedule and budget for the forthcoming 12 months. The annual rehabilitation plan must contain information that defines concurrent rehabilitation and remediation activities for the forthcoming 12 months and how these relate to the operations' closure vision, as detailed in the final rehabilitation, decommissioning and mine closure plan. It must also indicate what closure objectives and criteria are being achieved through the implementation of the plan.

The final rehabilitation, decommissioning and mine closure plan must be measurable and auditable, must take into consideration the proposed post-mining end use of the affected area and must contain information that is necessary for the definition of the closure vision, objectives and design and relinquishment criteria, indicating what infrastructure and activities will ultimately be decommissioned, closed, removed and remediated and the risk drivers determining actions, indicating how the closure actions will be implemented to achieve closure relinquishment criteria and indicating monitoring, auditing and reporting requirements.

There are several guideline documents which provide recommendations on how rehabilitation and closure should be undertaken. For the purpose of the plan the following guideline documents were considered:

- Guidelines for the Rehabilitation of Mined Land. Chamber of Mine of South Africa/ Coaltech. November 2007;
- Surface Strip Coal Mining Handbook. South African Colliery Managers Association, Project SACMA 01/03. Compiled by R J Thompson, 2005; and
- Best Practice Guidelines (BPGs) series developed by the Department of Water Affairs (DWA).

In addition to the abovementioned guideline documents, further regulations must be considered pertaining to closure and rehabilitation. These are as follows:

- Mineral and Petroleum Resources Development Act 28 of 2002: Mineral and Petroleum Resources Development Regulations (2004);
- International Finance Corporation (IFC) Environmental, Health and Safety (EHS) guidelines;
- Constitution of the Republic of South Africa Act 108 of 1996;
- National Environmental Management Act 107 of 1998, as amended;
- National Water Act 36 of 1998;
- National Environmental Management: Waste Act 59 of 2008, as amended;
- Mine Health and Safety Act 29 of 1996;
- National Environmental Management: Air Quality Act 39 of 2004;
- National Heritage Resources Act 25 of 1999; and
- Conservation of Agricultural Resources Act 43 of 1983.

3.1.2 Approach

There were a number of tasks that were involved in the compilation of this addendum to the rehabilitation plan for the proposed project operation; namely:

- Review of all existing information (specifically the contents of the previous rehabilitation plan);
- Setting objectives;
- GIS mapping; and
- Report compilation.

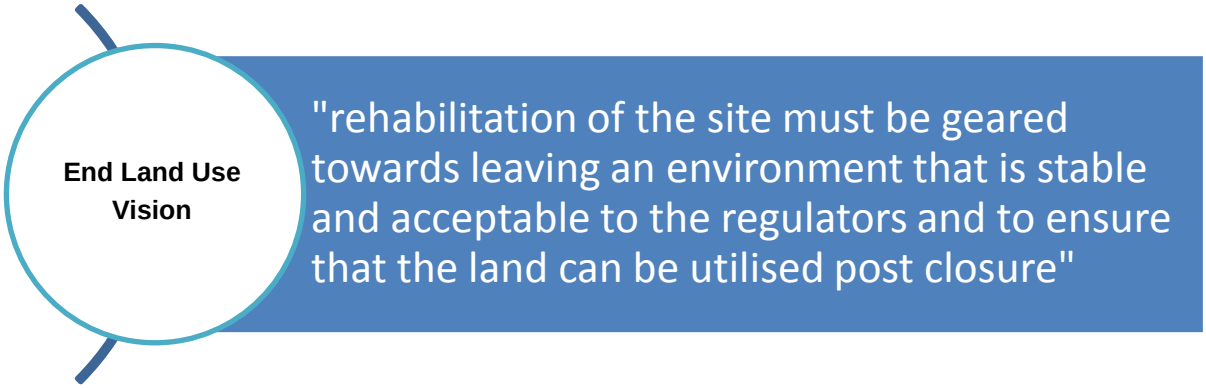
4 Assumptions and Limitations

- It is assumed that the rehabilitation plan will be based on the final end land use, as prescribed in the existing rehabilitation plan compiled by Digby Wells (2013);
- The rehabilitation plan should be revised and updated annually to take into account further developments, which is now a legal requirement in terms of the Financial Provisioning Regulations (GN R 1147 of 20 November 2015).

5 Strategic Planning and Sustainable Development for Closure

5.1 Closure Vision/Land Use Vision

It is important that a post closure vision is defined from the outset. Workshops and Toolbox Talks are methodologies in which this vision is discussed and defined:



5.2 Post-Mining Land Use

According to the Chamber of Mines Guidelines for the rehabilitation of mined land 'effective rehabilitation', is defined as *"rehabilitation that will be sustainable, in the long term, under normal land management practices*" (Chamber of Mines, 2007; Department of Minerals and Energy, 2008).

Annual rehabilitation planning and monitoring is now a legal requirement and the holder of a mining right will be required to

- Review concurrent rehabilitation and remediation activities already implemented;
- Establish rehabilitation and remediation goals and outcomes for the forthcoming 12 months in line with the outcomes of the final mine closure plan;
- Establish a plan, schedule and budget for rehabilitation for the forthcoming 12 months;
- Identify and address shortcomings experienced in the preceding 12 months of rehabilitation; and
- Evaluate and update the closure costs.

It is recommended that rehabilitated land should be reconstructed to pre-mining grazing within the areas where surface infrastructure will be. This addendum excludes the Tailings Storage Facility (TSF). For further detail regarding the TSF refer to the Conceptual Rehabilitation Plan for the Proposed Platreef Underground Mine (Digby Wells, October 2013).

5.3 Post-Mining Infrastructure Use

With the evolution of the closure and rehabilitation plan, the post-mining use of the mining infrastructure needs to be evaluated and determined whether or not it will support the mine's vision and to ensure that if infrastructure remains that it can be utilised post closure (excluding the TSF).

In instances where surface suitable infrastructure remains post closure, the mine must ensure that it could be used sustainably by local communities. If there is no sustainable use for mine infrastructure it is recommended that such infrastructure rather be demolished to avoid it being vandalized (excluding the TSF).

5.4 Key Stakeholders and Closure Needs

The aim of this step is to identify in the local community the individuals, organisations and/ or businesses that are interested in participating in the realisation of the closure and assessments of infrastructure for post closure use. Stakeholder engagement regarding the project is and will be an ongoing process. With specific reference to stakeholder engagement associated with closure and rehabilitation, the Interested and Affected Parties (I&APs) will need to be involved in the closure planning process from the beginning, through the life of mine and should be part of the mine closure solution. The affected stakeholders are incorporated into the agreed draft closure vision that has been defined in Closure Vision.

The public participation process (PPP) should be viewed as an on-going process during the EIA Amendment Process and should present stakeholders with relevant and accessible project information as it becomes available. The setting up of the Communication Strategy will encourage open and transparent communication for the development of trust between all stakeholders and will contribute to the facilitation of a project whose design and implementation, if approved, will be acceptable, and ideally beneficial, to all stakeholders involved.

Any changes that occur with respect to the closure vision or particular aspects associated with closure and rehabilitation will require input from the project stakeholders.

6 Land Preparation

The aim of land preparation is to ensure that the area impacted is kept to an absolute minimum. All infrastructure and mining activities need to be designed with closure in mind. Sensitive areas should be demarcated as no-go areas and managed appropriately. Top soil stockpile areas are also to be demarcated as no-go areas.

6.1 Vegetation conservation

The vegetation is mostly to be mulched across the areas of disturbance prior to soil stripping. The mulched vegetation must be removed together with the topsoil so as to preserve the organic content in the soil as well as the seed bank for the replacement of soil and re-vegetation. Protected trees which require permits for their relocation are either provincially protected and listed under Schedule 12 of Limpopo Environmental Management Act (LEMA; 2003) or nationally protected and listed under the Protected Trees List as part of the National Forests Act, 1998 (Act No. 84 of 1998). These trees may therefore not be mulched at all.

6.2 Soil

It is expected that soil will be stripped during the construction phase of the project. This material will be utilised as a cover material over the waste rock berm that will be constructed around the proposed operations. This material will act as the growth medium for the establishment of vegetation and assist with visually screening of the operation from the surrounding community. Once the soils has been utilised on the waste rock berm it is suggested that the berm be vegetated to prevent loss of this soil resource.

When utilising soil for rehabilitation purposes the following should be avoided if possible:

- Contamination impacts on soil quality;
- Erosion impacts on soil volume;
- Incorrect storage and handling of soil, leading to a deterioration in soils quality
- Indiscriminate storage impacts on soil quality; and
- Utilising soil for other purposes, other than rehabilitation, leading to impacts on soil volume (loss of soil as a resource).

6.2.1 Soil Types for Stripping and Stockpiling

The soil survey that was conducted for the proposed project must be utilised to generate the soil stripping guideline. The boundaries of the different soil types should be demarcated and each soil horizon (within each soil type's suitability for rehabilitation) should be defined. If possible, the stripped soils should be replaced immediately in a similar location in the topographical slope to their natural location (for the proposed project soil will be stripped and used to construct a berm and the unused balance stockpiled. After vegetation has been stripped, soil types need to be pegged out accurately (pegging out soil types ahead of stripping). The topsoil and subsoil should also be removed from the areas associated with the proposed mine infrastructure and stockpiles. Table 6-1 provides measures that should be considered during the stripping of soil during the construction phase of the project.

Table 6-1: Soil stripping measures during construction and operation

Construction (including site preparation)

Plan site clearance and alteration activities for the dry season (May to October).
Restrict extent of disturbance within the Platreef project site and minimise activity within designated areas of disturbance.
Minimise the period of exposure of soil surfaces through dedicated planning;
Stripping operations should only be executed when soil moisture content will minimise the risk of compaction (during dry season).
It is proposed that there will not be a dedicated soil stockpile and soil will be placed on the waste rock berm as rehabilitation growth medium for establishment of vegetation.
Operation
Monitoring of the condition of all unpaved roads is necessary due to the high rainfall and potential water runoff and erosion of the soils present in the Ivanplats project site. Water runoff from compacted road surfaces may cause erosion of road shoulders degrading the road surface. Weekly inspections need to be carried out of all unpaved roads especially during the rainy season.

Stockpiling should be minimised as far as possible as it increases compaction and decreases the viability of the seed bank. The soils should be stockpiled on the parent soils and as close to the originally stripped and final rehabilitation areas as possible. The top and sub soils are to be stockpiled in a berm like manner within the project area.

6.2.2 Stockpile Management

Established stockpiles should be managed to ensure that soil losses are minimised and that additional damage to the physical, chemical or biotic content is minimised. Stockpile soil health, volume and biotic integrity can potentially be harmed by factors including erosion, 'borrowing' for other purposes, contamination and water logging.

Stockpiles should be re-vegetated to avoid soil loss due to erosion and weed colonisation if stockpiles remain in the same location for more than one growing season and have not re-vegetated naturally. A similar seed mixture to the final mixture recommended for rehabilitation should be used. The looseness of the soil in stockpiles should be preserved (assuming stripping and construction of the stockpiles are done correctly) by fertilising and seeding by hand, hydroseeding (as is the norm in the industry) or seeding aerially to minimise the introduction of compaction. If stockpiles are already compacted, standard agricultural equipment can be used to establish grass cover. Weed infestation should also be controlled on the stockpiles by approved methods and herbicides (e.g. Roundup).

It is very important that soils are only used for the intended purposes. The dumping of waste materials next to or on stockpiles and the pumping out of contaminated water from infrastructure areas are hazards to stockpiles. Employees must be made aware of these hazards and a detailed management and monitoring programme should be put in place.

It is proposed that the berm that surrounds the proposed project site is vegetated.

6.2.2.1 Compaction Avoidance

Soils should be stockpiled loosely. Achieving this will depend on the equipment being used during the stripping and stockpiling process.

Soils should be dumped in a single lift if truck and shovel methods are used. If the dumps are too low, then the height could be increased by using a dozer blade or back actor bucket to raise the materials.

The use of heavy machinery should be avoided as it results in the compaction of soils and destruction of the soil structure. It is not recommended that a bowl scraper or grader be used to level and shape the stockpiles. If heavy machinery must be used, then compaction can be reduced by stripping and dumping as thick a cut as possible. Deposition of soils in a single track line may also reduce the compaction of the dumped or replaced soil.

7 Rehabilitation Actions

The actions contained within this section are to be implemented in conjunction with those contained within the existing Rehabilitation Plan (Digby Wells, 2013).

The criteria which are described herein are mostly conceptual actions and the table below gives the definitions of the various aspects involved in the compilation of the plan and the level of detail required at this time of the project. Some areas may at a further stage than anticipated, and this is described in the summary table below.

Table 7-1: Definitions of the main closure criteria of a preliminary closure plan

Main criteria	Definition of preliminary closure plan requirements
Closure criteria - Preliminary Rehabilitation Plan	The criteria used in the closure cost estimate are based on experience and available information.
Impacts / Mitigation - Preliminary Rehabilitation Plan	The potential closure and post closure impacts are based on general experience and technical investigations or significance rating.
Rehabilitation – Preliminary Rehabilitation Plan	The suggested rehabilitation methods are based on experience and known methods from other sites. No trails have been undertaken.

7.1 Physical Closure

This section refers to the recommended actions to be taken when the physical surface structures associated with the recently ceased mining needs to be decommissioned, demolished, closed and ensured to be safe. This only includes infrastructure within the 345 ha mining footprint area.

7.2 Surface Closure

7.2.1 Infrastructure Removal

The following steps should be followed during infrastructure removal:

- Identify infrastructure items that may be of use to the future land users;
- In association with those users and the authorities, define what could be left, how it would be used and how sustainable that use would be;
- The remaining infrastructure should be assessed for its suitability for re-use/recycling;
- The re-usable items should be removed from the site;
- Hazardous material locations and deposits require specialised assessment and analysis to determine how these materials should be decontaminated and to ensure that all residual hazardous materials are disposed of at licensed hazardous waste disposal facilities;
- Mining infrastructure that will be left on site must be rendered safe;
- Remaining structures should be demolished and the demolition rubble removed;
- The final landform agreed for the infrastructure areas should be created; and
- Soil should be replaced on the disturbed area and re-vegetated.

7.2.2 Rehabilitation of Infrastructure

The following section gives a brief description regarding rehabilitation and closure of the infrastructure associated with surface infrastructures.

7.2.2.1 *Mine Infrastructure: Headgear, Ventilation Equipment, Powerlines, Substations and Ancillary Infrastructure (offices etc)*

The closure costing assessment undertaken by Digby Wells provided a financial quantum for the demolition of mine infrastructure. Infrastructure such as power lines etc., could be utilised post closure to assist with the development of the area once closure of the site occurs. In the event that such infrastructure remains the associated long term liabilities need to be assessed and determine. In the instance that such infrastructure is decommissioned the following should be implemented:

- All infrastructure, including buildings and selected access roads are removed and appropriate rehabilitation measures implemented to achieve the desired final land use;
- Any hazardous material found within the areas is removed and disposed of at the appropriate facility; this includes hydrocarbon spillages that may have occurred to soil. These areas need to remediated using the appropriate measures and either the soil needs to be bio remediated or disposed of at a licensed hazardous waste disposal site;
- Concrete that is not contaminated with hazardous waste could be used as backfill in the shafts, but if contaminated, it must be disposed of at an appropriate facility;
- Concrete facilities, such as supporting foundations, should be demolished to 1 m below ground level;
- The mine areas must be cleared of all demolition waste and rubble;
- When shaping of the site is undertaken, reshaping must be free draining and should resemble the surrounding topography; shaping should be signed off by the chief land surveyor;
- Appropriate topsoil must be placed back on disturbed areas, the thickness of topsoil deposited should be aligned to the final land use;
- An appropriate seed mixture of species that are drought tolerant should be utilised for rehabilitation purposes.

7.2.2.2 *Run of Mine and Ore Stockpiles*

These stockpiles that will be designed and constructed will be temporary for the life of mine, when the mine is decommissioned, these facilities should also be decommissioned and rehabilitated. Areas where stockpiles are located need to be cleaned up of any contamination and disposed of in the appropriate manner.

The area needs to be shaped and ripped to an appropriate depth (normally 1m) and should be free draining. An appropriate seed mixture should be utilised and monitoring of alien invasive needs to be undertaken.

7.2.2.3 Areas where hydrocarbons and hazardous materials are stored (Fuel Infrastructure)

Facilities such as the fuel facility will need to be decommissioned and made safe. All infrastructure such as tanks that potentially could be utilised for future use should be removed. Concrete lined bunded areas need to be broken down and this material disposed of at an appropriate facility. Shaping, topsoil replacement and vegetation establishment can commence once this has been undertaken.

7.2.2.4 Sealing of the Shaft

Where underground mining has been done, the key issue is the sealing and making safe of mine shafts, adits, ventilation raises and any other routes to the underground workings. In all cases, all the access routes must be sealed.

It is recommended that for the access or vertical shafts, the procedure involves the filling of the shaft, as far as practically possible with inert rubble from demolition, or waste materials. The shaft must be sealed with concrete seals, designed by a professional engineer and approved by the DMR and should be positioned in unweathered rock to ensure that they are permanent.

In addition it will be a requirement to install “breather” pipes for gas release, or for water release systems where the ultimate re-establishment of the water table will result in water decant from the shaft position. Finally, the seals should be covered with inert material and topsoil and then re-vegetated.

7.2.2.5 Waste Rock Berms/Stockpiles

Topsoil and subsoil from the proposed waste rock stockpile footprint should be stripped and stockpiled with the initial purpose of delimiting the perimeter of the stockpile prior to placing the waste rock on site. It has been assumed that a proportion of the waste rock will be utilised (assumed to be inert) during the construction phase as a berm and the remainder of the waste rock will be stockpiled..

It is proposed that some of the waste rock be used for backfilling of the underground sections of the mine. Taking this into account the rehabilitation of the final waste rock stockpile will occur during the closure phase.

A berm will be constructed around the proposed project site and will consist of rock material extracted during mining operations and establishment of the shaft. The soil that is also stripped during the construction phase should be placed on this berm and shaped. The soil will act as a growth medium for the establishment of vegetation and aid in screening the operations. it is proposed that the berm will remain post closure, this it is crucial that it is constructed appropriately and made safe (i.e. don’t have steep side slopes). The vegetation of the berm will minimise the potential for erosion on the side slopes. To further limit the erosion potential, indigenous vegetation should be seeded prior to the onset of the wet season.

Maintenance of the vegetation and topsoil on the berm must take place after closure with the areas of erosion being rehabilitated and re-vegetated. This should take place for a minimum of three-four years or until appropriate vegetation has established on the berm.

7.3 Subsidence

Massive mining methods will be utilised. As this mining method will be utilised there is a risk for subsidence to occur and this needs to be taken into consideration and how this will impact on the environment, with particular emphasis on surface collapse in the event that it does occur.

To mitigate against the possibility of subsidence occurring a Rock Engineer should be consulted during the process to minimise the risk of subsidence occurring and how this risk will be mitigated or limited as far as practically possible. There is a possibility that waste rock

will be utilised as backfill and places into the mined stopes, thus minimising the risk of subsidence.

7.4 Biophysical Closure and Rehabilitation

7.4.1 Final Landform and Ecological Functionality

In terms of the remaining infrastructure, once the site has been cleared of all removable infrastructure and rubble the exposed underlying materials should be reshaped to create a gently sloping, free-draining topography. The topsoil and sub soil that was removed during the construction phase should be replaced (as the final top layer), fertilised and ripped. In cases where the foundations of the structures are impractical to remove, the foundations should be covered with a combination of soft overburden or B horizon material topped with a layer of topsoil, which should be at least 1 m thick (700 mm of B horizon and 300 mm of topsoil). After these tasks have been completed the infrastructure sites can be included in the rehabilitation process for re-vegetation, monitoring and maintenance.

7.4.1.1 Final Land Use and Capability

It is recommended that rehabilitated land should as far as possible, be reconstructed to pre-mining grazing capabilities within the areas where surface infrastructure will be. This addendum excludes the Tailings Storage Facility (TSF). For further detail regarding the TSF refer to the Conceptual Rehabilitation Plan for the Proposed Platreef Underground Mine (Digby Wells, October 2013).

7.4.1.2 Soil Replacement

7.4.1.2.1 Location

Once the final land-form has been created, soil replacement can begin. The soils are to be replaced, if possible, into the original locations of these soils.

7.4.1.2.2 Compaction Avoidance

Compaction limits the effectiveness of replaced soils. The equipment used during the replacement of the soils has a major impact on the compaction levels. Ideally heavy machinery should not be used to spread and level soils during replacement. The truck and shovel method should be used since it causes less compaction than, for example, a bowl scraper.

When using trucks to deposit soils, the full thickness of the soil required can be placed in one lift. This does, however, require careful management to ensure that the correct volumes of soil are replaced. The soil piles deposited by the trucks will have to be smoothed before re-vegetating the area.

The soils that are deposited with trucks need to be smoothed before re-vegetation can take place. A dozer (rather than a grader) should preferably be used to smooth the soils since it exerts a lower bearing pressure and thus compacts less than wheeled systems.

7.4.1.2.3 Soil Amelioration

Replaced soils require both physical and chemical amelioration as the actions of soil removal, stockpiling and replacement result in high levels of soil compaction and a dilution of the fertility of the soil originally present and concentrated in the surface layers. The actions that should be taken during the amelioration of soils are as follows:

- The deposited soils must be ripped to ensure reduced compaction;
- An acceptable seed bed should be produced by surface tillage;
- Restore soil fertility;
- Incorporate the immobile fertilisers in to the plant rooting zone before ripping; and
- Apply maintenance dressing of fertilisers on an annual basis until the soil fertility cycle has been restored.

7.4.1.3 Re-Vegetation and Biodiversity Establishment

7.4.1.3.1 Aims and Objectives

The main aim of re-vegetation for the project area is to restore the area to the indigenous Bushveld. It is advised to restore the project area as far as possible to wild game grazing potential or higher. The overall objectives for the re-vegetation of reshaped and top-soiled land are to:

- Prevent erosion;
- Restore the land to the agreed land capability;
- Re-establish eco-system processes to ensure that a sustainable land use can be established without requiring fertilizer additions; and
- Restore the biodiversity of the area as far as possible.

7.4.1.3.2 Rehabilitation Species

The rehabilitation “seed cocktails” generally consist of grasses as they rapidly establish and provide excellent protection against surface erosion. The area has a relatively low rainfall with evaporation often 4 times higher than rainfall on an annual basis. Soils are mostly sandy and do not retain water well. Given the extreme conditions, self-seeding and **stoloniferous** grasses have been suggested. Table 7-2 is a grass seed mix advised for the rehabilitation areas of the project areas.

Table 7-2: Grass seed mix and tree species recommended for rehabilitation re-vegetation

Grass Species	Kg/ha
Chloris gayana (Rhodes grass)	4
Cenchrus ciliaris (Blue Buffalo Grass)	1
Digitaria eriantha (Fingergrass)	4
Cynodon dactylon (Kweek)	3
Eragrostis teff (Teff)	1

7.4.1.3.3 Re-Vegetation

The stockpiles and topsoil storage areas need to be stabilised with vegetation, mainly grasses. Long-term post-closure rehabilitation will allow the re-vegetation of the grasses, bushes and trees.

Given that the area is highly water stressed, hydroseeding is most likely not a viable option. The methodology of a Pitting Machine is recommended for this area and climate.

The project area is a summer rainfall region and the first significant rains generally occur around October.

- It is advised to seed the grass seed mixture soon after the first rains of the wet summer season. These areas are to remain as “No Go” areas and all grazing animals must be kept out.
- Fertilising of 250kg/ha 2:3:2 (22) is proposed at seeding time and a follow up dose during the first season following good rain.
- Maintenance applications of 100kg/ha LAN can be applied after good rain in the follow up season.

7.4.1.4 Surface and Groundwater

The final profile achieved should be acceptable in terms of the surface water drainage requirements and the end land use objectives.

7.4.2 Air Quality

Revegetation is critical for acceptable closure of the area to achieve sustainable and good air quality. It is recommended to minimise the erosion to reduce the potential for fugitive dust generation.

8 Monitoring and Maintenance

The purpose of monitoring is to ensure that the rehabilitation objectives are met and that the rehabilitation process is followed. The physical aspects of rehabilitation should be carefully monitored as well as during the progress of establishment of desired final ecosystems.

The following items should be monitored whilst rehabilitation activities are being performed:

- Alignment of actual final topography to agreed planned landform (surveyor's records);
- Depth of topsoil stripped and placed (surveyor's records);
- Chemical, physical and biological status of replaced soil (soil analyses);
- Erosion status (visual observations and records);
- Surface drainage systems and surface water quality at agreed locations (surface water assessments);
- Groundwater quality at agreed locations (groundwater assessments);
- Vegetation basal cover (fauna and flora monitoring);
- Vegetation species diversity (fauna and flora monitoring);
- Faunal re-colonisation (Sherman and pitfall trapping) (fauna and flora monitoring); and
- Proportion of mined land that has been fully rehabilitated (rehabilitation monitoring).

Monitoring of surface and groundwater resources as well as air quality (dust sampling) should take place on a monthly basis for the first 12 months after rehabilitation has been completed. Aquatic ecosystems should be monitored bi-annually i.e. once during the wet season and once during the dry season. After the first 12 months of monitoring the frequency of sampling should be adjusted to quarterly monitoring for the surface and groundwater resources. Aquatic ecosystems should still be monitored on a bi-annual basis and dust sampling should be undertaken on a monthly basis. This monitoring should continue for an additional 36-48 months.

The overall objective of the rehabilitation plan and this subsequent addendum is to ensure activities associated with the infrastructure within the mining footprint area will be designed to prevent, minimise or mitigate adverse long-term environmental and social impacts and create a self-sustaining ecosystem.

8.1 Final Topography

The topography that is achieved during rehabilitation should be monitored and compared to the planned topography. The final profile achieved should be acceptable in terms of the surface water drainage requirements and the end land use objectives. The survey department should do an assessment of the reshaping carried out on the site and signoff should be obtained from the rehabilitation specialist before the topsoil is replaced.

8.2 Depth of Topsoil Stripped and Replaced

The recovery and effective use of the usable topsoil available is very important. It is also important to undertake regular reconciliation of the volumes stripped, stockpiled and returned to the rehabilitated areas. A topsoil balance can be used to keep track of soil resources on the mine.

A final post-mining rehabilitation performance assessment should be done and information should be adequate for closure applications that involve:

- Assessment of rehabilitated soil thickness and soil characteristics by means of auger observations using a detailed grid;
- A post-mining land capability map based on soil thickness and characteristics;
- A proposed post-mining land use map;
- Erosion occurrences;
- Fertility analysis and soil analysis; and
- Representative bulk density analysis.

8.3 Chemical, Physical and Biological Status of Replaced Soils

It is advised that after rehabilitation the depth of the replaced soils should be assessed using a soil auger in a regular grid pattern. The standard spacing of auger holes is 100 m by 100 m which results in one hole per hectare.

It is suggested that each auger hole is georeferenced and that the results are plotted. The auger points can be used to identify compact soil layers, the degree of disturbance of the soil and the plant rooting pattern.

It is recommended that soil fertility sampling is undertaken independently of the auger survey. The land should be split into logical land use units and should not be bigger than 100 ha.

These assessments should be conducted pre-establishment to ensure that immobile nutrients can be applied and incorporated deep into the plant rooting zone during the initial tillage process.

8.4 Erosion

Erosion monitoring of rehabilitated areas should be undertaken for a minimum of 3-4years and zones with excessive erosion should be identified. Erosion can either be quantified or the occurrence there-of simply recorded for the particular location.

8.5 Surface Water

8.5.1 Drainage systems

The functionality of the surface water drainage systems should be assessed on an annual basis. This should preferably be done after the first major rains of the season and then after any major storm. An assessment of these structures will ensure that the drainage on the recreated profile matches the rehabilitation plan as well as to detect early on when any drainage structures are not functioning efficiently. These can then be repaired or replaced before it causes significant erosion damage.

8.5.2 Water quality

The quality of all water leaving the property should be monitored on a regular basis (as per the EMP) to ensure compliance of the various constituents with the standards approved by the DWA. Samples should be analysed for particulate and soluble contaminants as well as biological.

Additional monitoring should include aquatic biomonitoring (invertebrates, habitat, water quality and fish) on a bi-annual basis (high and low flow) to determine the ecological functioning and health of the rivers and streams, in and around the rehabilitated areas. The ecological functioning of the wetlands should similarly be assessed on an annual basis.

8.6 Groundwater

The groundwater levels and quality should be measured and monitored in a similar way to the surface water to determine the impact of the mining activities on the groundwater resources. A hydrogeologist, together with the relevant authorities, should determine the locations of the monitoring boreholes. The monitoring frequency will be determined by the regulator.

8.7 Vegetation Basal Cover

Basal cover refers to the proportion of ground at root level which is covered by vegetation and by the rooting portion of the cover plants. The line-transect (or the quadrat bridge) method can be used to establish sampling positions. A target of 15% basal cover should be set for fully established vegetation

8.7.1 Vegetation Species

Post rehabilitation biodiversity assessments and surveys should be undertaken by external experts to establish the full range of plants that have become established. Summer and winter samplings should be done during these assessments. These type of assessments should continue for a minimum of 3-4 years or until an appropriate vegetation cover and species composition has established.

9 Conclusion

The overall objective of the rehabilitation plan and addendum is to ensure activities associated with the infrastructure within the mining footprint area will be designed to prevent, minimise or mitigate adverse long-term environmental and social impacts and create a self-sustaining ecosystem.

This report must be considered as a living document and is required to be updated on an annual basis with respect to the legislative requirements which have come into effect.

- In terms of recommendations the following was made in the original report compiled and remain unchanged:
- It is recommended that the financial provision for closure and rehabilitation be annually updated as per legislative requirements outlined in the Financial Provisioning Regulations, GN R 1147 (GG 39425 of 20 November 2015);
- Site infrastructure:
  - Long term management of the rehabilitated areas will be required via contractual agreements with land owners in the area;
  - Rehabilitation should also be undertaken to best practise and taking into account legal requirements;
- Regular audits should be undertaken to monitor the progress of areas that have been rehabilitated for a period of 3-4 years at a minimum;
- Regular audits should be undertaken by a soil scientist during the soil stripping process. This will guarantee that soil are stripped and stockpiled correctly; and
- Surface water and groundwater monitoring to be undertaken to determine the impacts associated with operations of the proposed mine.

10 References

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Digby Wells Environmental 2013.Rehabiltation Plan for the Platreef Project, Randburg.

Appendix A: Declaration of Independence and Specialist CV

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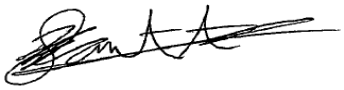
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I, Brett Coutts as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of the Proposed Platreef Underground Mine, near Mopopane, Limpopo Province.



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Full Name	Brett Gregory Coutts
Title / Position	Unit Manager: Rehabilitation
Qualifications	B.Sc in Ecology and Environmental Science
Experience (Years)	Nine (9)
Registration	SACNASP and IAIA

BRETT COUTTS

Mr. Brett Coutts

GIS Specialist/Senior Rehabilitation Consultant

Biophysical Department - Rehabilitation

Digby Wells Environmental

1 EDUCATION

- 2006 – 2007: BSc Honours in Ecology, Environment and Conservation - University of the Witwatersrand
- 2003 – 2006: Undergraduate BSc - University of the Witwatersrand

2 EMPLOYMENT

- September 2012 – Present: Digby Wells Environmental – Unit Manager: Rehabilitation
- October 2008 – August 2012: Terra Pacis Environmental (Pty) Ltd – Environmental Consultant
- November 2007 – September 2008: Hydromulch (Pty) Ltd – Junior Project Manager

3 EXPERIENCE

3.1 Current Work at Digby Wells

Brett is the Rehabilitation Unit manager and has been appointed to assist with the management and co-ordination of all relevant studies related to rehabilitation. This includes the management of rehabilitation projects, compilation of rehabilitation plans and undertaking of rehabilitation assessments. In addition to this Brett assists within the Biophysical Department with the management of specialist studies that are undertaken by the department and is also responsible for the compilation of the Geographic Information System (GIS) component of Biodiversity Land Management Plans (BLMP) ad undertaking ecological assessments.

3.2 Prior to joining Digby Wells Environmental (November 2007 – August 2012)

Prior to his appointment, he gained experience as a junior project manager on environmental rehabilitation projects at Hydromulch and then was appointed by Terra Pacis as an Environmental Consultant where his roles and responsibilities included the compilation of Basic Assessment (BA) reports, Scoping &Environmental Impact Reports, compilation of Environmental Management Plans (EMP), GIS mapping and Biophysical Studies.

4 PROJECT EXPERIENCE

The following project list is indicative of Brett's experience, providing insight into the various projects, roles and locations he has worked in.

Project	Role	Activities	Resource	Client	Location
Exxaro (portfolio)	Project Manager	Rehabilitation specialist	Coal	Exxaro	South Africa Limpopo and Mpumalanga
Bokoni Platinum Mine	Key Accounts Manager	Overall management and coordination of projects	Platinum	Bokoni Platinum Mine	South Africa
Anker Coal	Project Manager	Rehabilitation specialist	Coal	Namane Resources	South Africa Mpumalanga
Anglo Operations	Key Accounts Manager	Overall management and coordination of projects	Platinum	Anglo American	South Africa
Anglo Operations	Technical specialist	Compilation of rehabilitation and closure plan	Coal	Anglo	South Africa
Balama Graphite Mine	Technical specialist	Compilation of rehabilitation and closure plan	Graphite	Syrah Resources	Mozambique
Putu Iron Ore Mine	Technical specialist	Compilation of rehabilitation and closure plan	Iron ore	Putu Iron Ore Mine	Liberia
Anglo Operations	Technical specialist	Update of Closure Plan for Greenside Colliery	Coal	Anglo	South Africa
Sekoko Rehabilitation	Technical	Compilation of	Coal	Savannah	South Africa

Project	Role	Activities	Resource	Client	Location
Plan	specialist	rehabilitation and closure plan		Environmental	
Rehabilitation Plan for Consbrey and Hawar Projects	Technical specialist	Compilation of rehabilitation and closure plan	Coal	Msobo Coal	South Africa
Rehabilitation Plan for IPP Station	Technical specialist	Compilation of rehabilitation and closure plan	Power Station	Vedanta Resources	South Africa
Rehabilitation Plan	Technical specialist	Compilation of rehabilitation and closure plan	Platinum	Platreef	South Africa
Preliminary Closure Plan for New Liberty	Technical specialist	Compilation of rehabilitation and closure plan	Gold	Aureus mining	Liberia
Environmental and Social Impact Assessment	Project Manager	Project Manager	Gold	Aureus mining	Liberia
Thabametsi Coal Mine	Project Manager	Project Manager	Coal	Exxaro	South Africa
Wetland Offset Strategy	Project Manager	Project Manager	Coal	Exxaro	South Africa
Compilation of GIS Training Manual	Project Manager	Project Manager	GIS	In house	South Africa
Invasive Alien Plant control Procedure	Technical specialist	Compilation of management plan	Smelter Operations	BHP Billiton	South Africa
Vegetation, Invertebrate and Wetland Assessments and GIS Mapping	Technical Specialist	Compilation of report	Residential Development	Business Venture Investments	South Africa
GIS mapping for a range of Scoping and Environmental Impact Reporting	Technical Specialist	Public Participation and Report Writing	Smelter Operations	BHP Billiton	South Africa
Rehabilitation of a new road constructed in Mozambique	Contractor	Undertaking physical rehabilitation of road slopes and impacted footprint.	Construction Industry	Hydromulch	Mozambique

Project	Role	Activities	Resource	Client	Location
Biodiversity Management Plans (for two operations)	GIS Specialist	Technical input & project management	Gold	Randgold Resources	Mali and Ivory Coast
Biodiversity Management Plans (for six operations)	GIS specialist	Technical input & project management	Coal	Anglo American	South Africa

5 SHORT COURSES

2009: IEMA Approved Carbon Footprint Management Course: An Introductory Programme

2010: Exclusive Panel Discussion on: The Copenhagen Climate Change Conference

2011: International Association for Impact Assessments conference at the Wild Coast

2012: Centre for Environmental Management, North-West University: Environmental Law for Environmental Managers

6 PROFESSIONAL REGISTRATION

2009: IAIAsa - International Association for Impact Assessment (South Africa)

2012: Registered as a Candidate Natural Scientist with the South African Council for Natural Scientific Professions

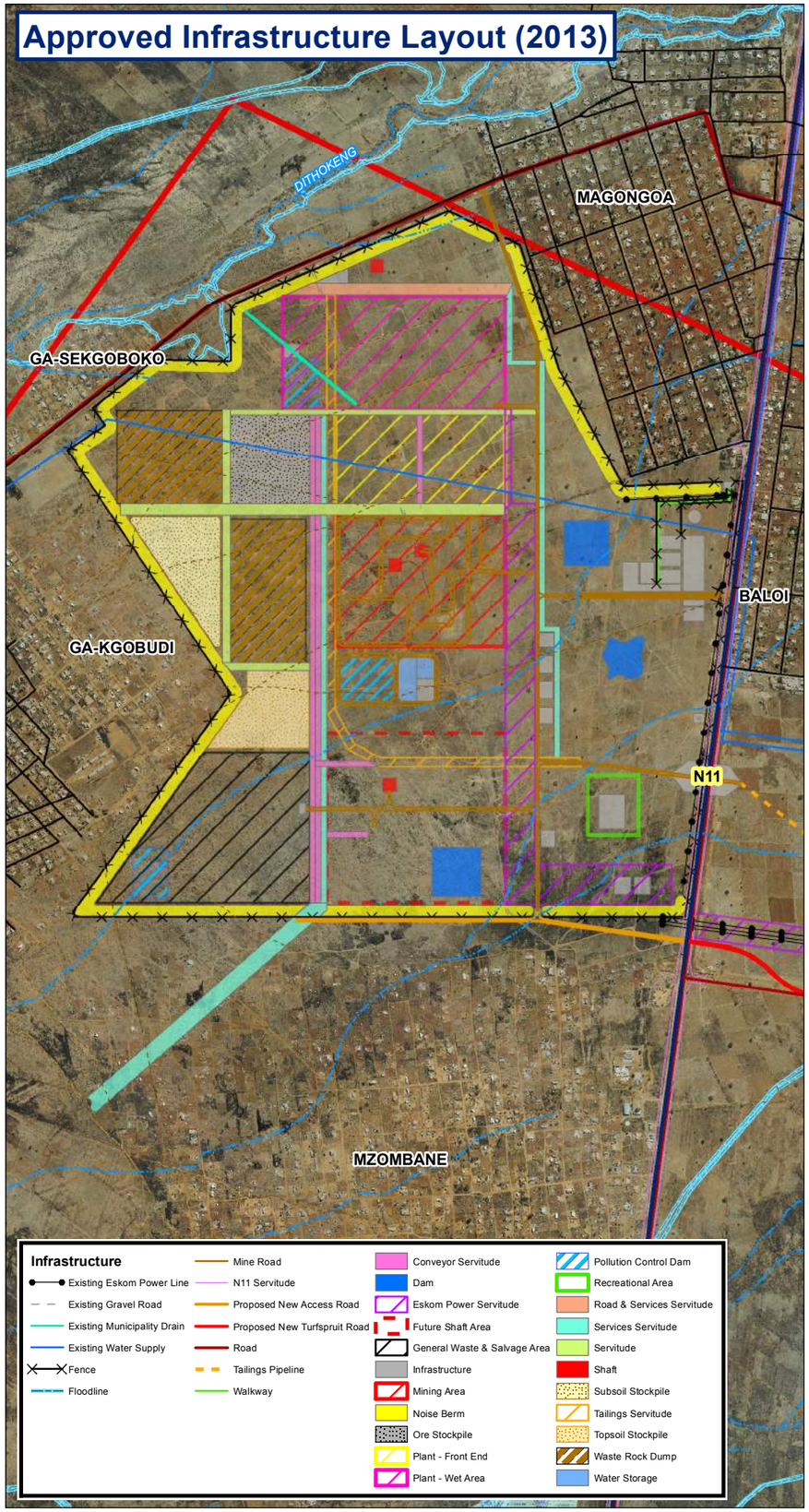
Appendix B: Infrastructure Plan

Plan 4

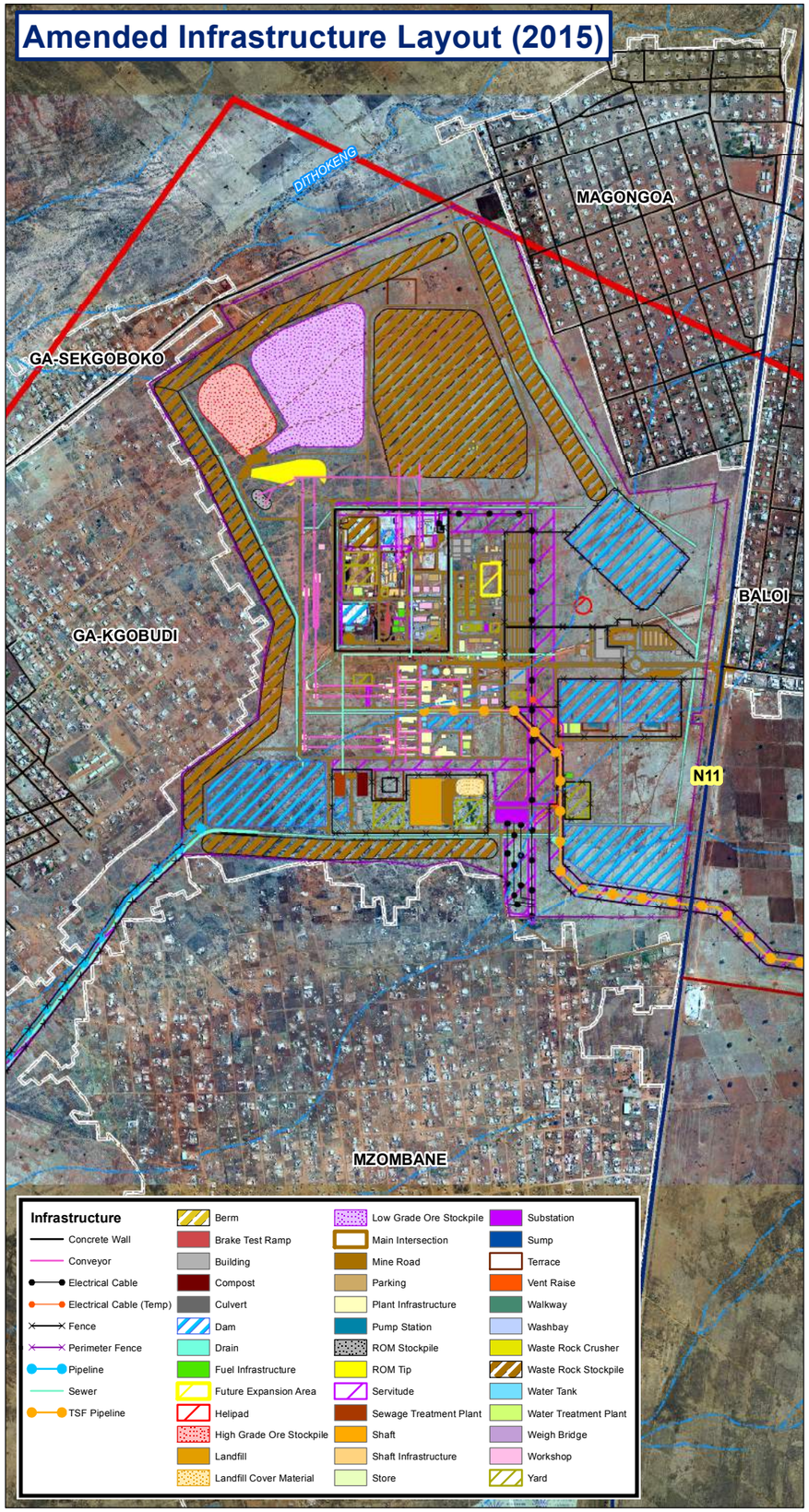
Ivanplats (Pty) Ltd

Comparative Layout

Approved Infrastructure Layout (2013)



Amended Infrastructure Layout (2015)



Legend

- Mining Right Area
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Wetland
- Residential Area

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Appendix J: Addendum Closure Cost Assessment

To:	Ivanplats (Pty) Ltd	**Date:**	18 February 2016
From:	Digby Wells Environmental	**Proj #:**	IVA3396
RE:	**Revised Financial Provision Estimate for the Platreef Underground Platinum Mine, Limpopo**		

1 Introduction

Ivanplats (Pty) Ltd (hereafter Ivanplats) has commissioned Digby Wells Environmental (Digby Wells) to update the financial provision assessment as part of the Environmental Management Programme (EMPr) amendment for the Platreef Underground Platinum Mine located near Mokopane in the Limpopo Province.

The DMR issued Ivanplats with a Mining Right for this operation on 04 December 2014. Since the granting of the licence, Ivanplats has commenced with the sinking of Shaft 1, as well as the development of certain project infrastructure such as the installation of a mine boundary fence, workshops and mine offices. The financial provision included in the initial Mining Right Application was estimated at R39,298,028. Platreef Mine have made provision for the full amount.

However, prior to the establishment of the mine boundary fence, the approved planned mining area was encroached upon by surrounding communities. This encroachment has resulted in the need to reduce the planned infrastructure footprint from 420 ha to 346 ha to exclude the surrounding communities. This reduction in the footprint area has resulted in the need for Ivanplats to amend the approved mine layout plan through changes to the footprint area and location of certain activities or infrastructure. Please refer to Appendix A for changes in the project layout. The change in the mine layout plan resulted in the subsequent amendment of the financial provision.

This financial provision assessment focused on the existing and proposed mining activities and was calculated by means of the Department of Mineral Resources' (DMR) standard method for assessment of mine closure. Activities incorporated into the calculation included the demolition and management of physical infrastructure and the rehabilitation of the areas affected by mining activities.

The areas for the mine which needed to be included in the current assessment were provided to Digby Wells by the Applicant.

2 Legislative Requirements

The closure cost assessment is done in accordance with the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended[1] and associated regulations.[2] These Regulations provide that the holder of a mining right must make full financial provision for rehabilitation of negative environmental impacts. The methodology used was based on the Department of Mineral Resources (DMR) *"Guideline Document for the Evaluation of the Quantum of Closure- related Financial Provision provided by a Mine"* (DME, 2005), as per the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

The financial provision must guarantee the availability of sufficient funds to undertake the following:

- Rehabilitation of the adverse environmental impacts of the listed or specified activities;
- Rehabilitation of the impacts of the prospecting or mining activities, including the pumping and treatment of polluted or extraneous water;
- Decommissioning and closure of the operations;
- Remediation of latent or residual environmental impacts which become known in the future;
- Removal of building structures and other objects; and
- Remediation of any other negative environmental impacts.

The closure cost assessment has been developed in line with these requirements.

The regulations for the determination of financial provision for mine rehabilitation and closure were promulgated on 20 November 2015 (GN R1147) under the NEMA, as amended. This report and associated review of the financial provision did not, however, address any of the requirements of these regulations. This report is based on the Regulations applicable as at 1 December 2014[3].

However, in accordance with the Financial Provisioning Regulations, 2015, the holder within 15 months after the coming into effect of the Regulations and annually thereafter, must ensure a review, assessment and adjustment of the approved financial provision in

[1] Previously, closure methodology was prescribed in Section 41 (1) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and its Regulations, but these provisions have been repealed. Section 24P in NEMA as amended provides that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts arising from mining activities.

[2] Environmental Impact Assessment Regulations, 2014, GN R982 in Government Gazette 38282 of 4 December 2014.

[3] Although none of the requirements of the new Regulations were applied in this Report, they will need to be addressed in all subsequent reports.

accordance with the Financial Provisioning Regulations, 2015. An audit of the Environmental Authorisation and update of the approved Environmental Management Programme Report (EMPr) may also be required.

3 Methodology

The "*Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine*" was used to assess the applicant's environmental liability at the pre-feasibility stage. The DMR Guideline format makes use of a set template for which defined rates and multiplication factors are used. The multiplication and weighting factors which ultimately define the rate to be used are determined by amongst others the topography, the classification of the mine according to mineral mined, the risk class of the mine and its proximity to build up or urban areas.

The methodology described below details how the environmental liability was estimated for the proposed mine.

3.1 Infrastructure Measurements

The infrastructure and mining areas were measured from the latest plan provided by the Applicant in November 2015. The updated measurements were included in the financial provision assessment for the FY2015. Measurements that were taken have been standardised to ensure that the costs calculated are easily updatable.

3.2 Rates

The DMR rates were published in 2005 and, due to inflation, are thus no longer accurate. The 2013 Master Rates used to calculate the previous liability as submitted with the initial EMPr dated November 2013 (LP30/5/2/2/1/10067MR) have been updated using an inflationary figure of 6.1% (Average CPI for 2014) and 4.5% (Average CPI for January to November 2015) was then added to the 2014 rates to reflect the current 2015 rates.

3.3 DMR Classification

The DMR Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine (DME, 2005), classifies a mine according to a number of factors which allows one to determine the appropriate weighting factors to be used during the quantum calculation. The following factors are considered:

- The mineral mined;
- The risk class of the mine;
- Environmental sensitivity of the mining area;
- Type of mining operation; and
- Geographic location.

Once the risk class (Class A, B or C) and the sensitivity of the area where the mine is located (Low, Medium or High) had been determined using the appropriate tables (Table 3-1, Table 3-2, Table 3-3, Table 3-4 and Table 3-5) the unit rates for the applicable closure components were identified.

Table 3-1: Primary Risk Class for Type of Mineral Mined (Applicant's Risk Class Highlighed in Red) [4]

Mineral	Ore	Size: large if > than (tpm)	Primary Risk Class			
			Large Mine		Small Mine	
			Mine and Mine Waste	Mine, Mine Waste, Plant and Plant Waste	Mine and Mine Waste	Mine, Mine Waste, Plant and Plant Waste
Antimony		1000	A	A	C	C
Asbestos		0	A	A	A	A
Base Metals (Copper, Cadmium, Cobalt, Iron ore, Molybdenum, Nickel, Tin, Vanadium)	Sulphide	10 000	A	A	C	A
	Oxide	10 000	C	A	C	A
Coal		0	A	A	A	A
Chrome		10 000	C	A	C	C
Diamonds and precious stones		10 000	C	B	C	C
Gold, silver, uranium		10 000	B	A	B	A
Phosphate		10 000	C	B	C	C

[4] Underground mines have a minimum risk ranking of B (Medium Risk)

Mineral	Ore	Size: large if > than (tpm)	Primary Risk Class			
			Large Mine		Small Mine	
			Mine and Mine Waste	Mine, Mine Waste, Plant and Plant Waste	Mine and Mine Waste	Mine, Mine Waste, Plant and Plant Waste
Platinum		10 000	C	B	C	B
Mineral sands (Ilmenite, Titanium, Rutile, Zircon)		10 000	C	B	C	C
Zinc and Lead		10 000	C	A	C	A
Industrial Minerals (Andalusite, Barite, Bauxite, Cryolite, Fluorspar)		10 000	C	C	C	C

Table 3-2: Criteria used to Determine the Area Sensitivity

Sensitivity	Sensitivity Criteria		
	Biophysical	Social	Economic
Low	■ Largely disturbed from natural state, ■ Limited natural fauna and flora remains, ■ Exotic plant species evident, ■ Unplanned development, ■ Water resources disturbed and	■ The local communities are not within sighting distance of the mining operation, ■ Lightly inhabited area (rural).	■ The area is insensitive to development, ■ The area is not a major source of income to the local communities.

Sensitivity	Sensitivity Criteria		
	Biophysical	**Social**	**Economic**
	impaired.		
Medium	■ Mix of natural and exotic fauna and flora, ■ Development is a mix of disturbed and undisturbed areas, within an overall planned framework, ■ Water resources are well controlled.	■ The local communities are in the proximity of the mining operation (within sighting distance), ■ Peri-urban area with density aligned with a development framework, ■ Area developed with an established infrastructure.	■ The area has a balanced economic development where a degree of income for the local communities is derived from the area, ■ The economic activity could be influenced by indiscriminate development.
High	■ Largely in natural state, ■ Vibrant fauna and flora, with species diversity and abundance matching the nature of the area, ■ Well planned development, ■ Area forms part of an overall ecological regime of conservation value, ■ Water resources emulate their original state.	■ The local communities are in close proximity of the mining operation (on the boundary of the mine), ■ Densely inhabited area (urban/dense settlements), ■ Developed and well-established communities.	■ The local communities derive the bulk of their income directly from the area, ■ The area is sensitive to development that could compromise the existing economic activity

Table 3-3: Weighting Factor 1 – Nature of Terrain

	Flat	**Undulating**	**Rugged**
Weighting factor 1: Nature of the terrain / accessibility	1.00	1.10	1.20

Note:

- Flat - Generally flat over the mine area;
- Undulating - A mix of sloped and undulating areas within the mine area; and
- Rugged - Steep natural ground slopes (greater than 1:6) over the majority of the mine area.

Table 3-4: Weighting Factor 2 – Proximity to Urban Area

	Flat	Undulating	Rugged
Weighting factor 2: Proximity to Urban Area where goods and services are to be suplied	1.00	1.05	1.10

Note:

- Urban - Within a developed urban area;
- Peri-urban - Less than 150 km from a developed urban area; and
- Remote - Greater than 150 km from a developed urban area.

The classification of the project site has been summarised in Table 3 5. It must be noted, however, that of the 18 closure components that exist only 3 are influenced by the risk class and sensitivity, the remaining 15 have a standard multiplication factor, irrespective of the class or sensitivity.

Table 3-5: Mine Classification

Mine	Risk Class	Sensitivity	Terrain	Proximity to Urban Area
Platreef Platinum Mine	B[5]	High	Undulating	Urban

3.4 Management Costs

As per the DMR requirements, a contingency of 10% on all infrastructure costs has been allowed for. A 6% Project Management fee as per the DMR guideline has also been

[5] Underground mines have a minimum risk ranking of B (Medium risk)

included. The total environmental liability calculated is inclusive of Value Added Tax (VAT) at 14%.

4 Assumptions

The following assumptions have been made in the determination of the financial provision:

- The surface layout plan with reference no. PRP-6190-G01-0002-01 MINE AREA - PLOT PLAN-Layout1 was used for the purpose of this liability calculation;
- The assessment was a desktop study which included calculating closure liabilities for Platreef based on areas and volumes provided by DRA Mining (Pty) Ltd. It is assumed that the information provided is accurate and reliable;
- The 2013 Master Rates used to calculate the previous liability as submitted with the initial EMPr dated November 2013 (LP30/5/1/2/2/10067MR) have been updated using an inflationary figure of 6.1% (Average CPI for 2014) and 4.5% (Average CPI for January to November 2015) was then added to the 2014 rates to reflect the current 2015 rates;
- The water management cost as per the DMR guidelines has been calculated for the area disturbed on surface[6];
- The sealing of shafts has been calculated using the shaft diameter multiplied by a 1 m thick concrete capping. and
- The environmental liability also includes areas of the mine which is earmarked for future expansion as indicated on the surface layout plan.

5 Summary of Liabilities

The financial provision for the Life of Mine of Platreef Mine is calculated to be R 121,291,493 based on the DMR method of calculation. The total cost includes contingencies of 10%, Preliminary and General (P&Gs) of 6% and is inclusive of VAT at 14%.

Table 5-1 presents the detailed forecast of the expected increase in financial provision as Platreef continues to progress through the construction phase into the operational phase in Year 2021. Platreef annually conducts a reassessment of their financial provision based on actual disturbances and it is recommended that this forecast be updated as the progress against the planned construction schedule can be verified. A detailed breakdown has been provided in Appendix B.

[6] The DMR Master Rate is based on a mine with both opencast and underground mine workings. Only underground workings exist at Platreef Mine.

Table 5-1: Financial Provision Forecast for Platreef

CALCULATION OF THE QUANTUM							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Mine:	Platreef	**Location:**	Mokopane, Limpopo Province														
Evaluators:	Digby Wells Environmental	**Date:**	12-Jan-16														
No.:	**Description: Class C (Low Risk)**	**Unit:**	**B**	**C**	**D**	**LoM**											
			Master rate	**Multiplication factor**	**Weighting factor 1**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**
			Step 4.3	**Step 4.3**	**Step 4.4**												
1	Dismantling of processing plant & related structures (incl. overland conveyors & Power lines)	m^3	R 12.88	1.00	1.10	R8,547,585	R61,962	R61,962	R61,962	R6,676,799	R6,774,147	R6,774,147	R6,774,147	R6,774,147	R6,774,147	R6,774,147	R6,774,147
2 (A)	Demolition of steel buildings & Structures	m^2	R 179.47	1.00	1.10	R14,613,426	R872,573	R3,021,663	R3,817,450	R4,709,380	R13,873,668	R25,073,918	R25,073,918	R25,073,918	R25,073,918	R25,073,918	R25,073,918
2 (B)	Demolition of reinforced concrete buildings & structures	m^2	R 264.48	1.00	1.10	R11,045,684	R56,440	R99,207	R99,207	R216,161	R4,291,801	R5,147,718	R5,147,718	R5,147,718	R5,147,718	R5,147,718	R5,147,718
3	Rehabilitation of access roads	m^2	R 32.12	1.00	1.10	R8,165,031	R269,355	R269,355	R269,355	R7,523,181	R7,523,181	R8,165,006	R8,165,006	R8,165,006	R8,165,006	R8,165,006	R8,165,006
4 (A)	Demolition & rehabilitation of electrified railway lines	m	R 311.71	1.00	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
4 (B)	Demolition & rehabilitation of non-electrified railway lines	m	R 170.02	1.00	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
5	Demolition of housing &/or administration facilities	m^2	R 358.94	1.00	1.10	R6,808,908	R513,284	R513,284	R513,284	R3,222,633	R6,419,602	R6,808,513	R6,808,513	R6,808,513	R6,808,513	R6,808,513	R6,808,513
6	Opencast rehabilitation including final voids & ramps	ha	R 188,160.01	**1.00**	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
7	Sealing of shafts, adits & inclines*	m^3	R 96.35	1.00	1.10	R64,693	R32,324	R32,324	R64,649	R64,649	R64,649	R64,649	R64,649	R64,649	R64,649	R64,649	R64,649
8 (A)	Rehabilitation of overburden & spoils	ha	R 125,440.01	1.00	1.10	R284,247	R304,297	R454,203	R453,967	R8,215,568	R10,403,994	R10,579,234	R10,579,234	R10,579,234	R10,579,234	R10,579,234	R10,579,234
8 (B)	Rehabilitation of processing waste deposits & evaporation ponds (basic, salt producing waste)	ha	R 156,233.26	1.00	1.10	R22,686,788	R135,334	R647,465	R680,552	R2,571,421	R6,071,693	R9,697,867	R9,697,867	R9,697,867	R9,697,867	R9,697,867	R9,697,867
8 (C)	Rehabilitation of processing waste deposits & evaporation ponds (acidic, metal-rich waste)	ha	R 453,775.44	**0.90**	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
9	Rehabilitation of subsidised areas	ha	R 105,037.11	1.00	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
10	General surface rehabilitation	ha	R 99,369.64	1.00	1.10	R10,668,325	R200,282	R337,561	R418,797	R1,319,167	R8,666,768	R10,774,188	R10,774,188	R10,774,188	R10,774,188	R10,774,188	R10,774,188
11	River diversions	ha	R 99,369.64	1.00	1.10	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0	R0
12	Fencing	m	R 113.35	1.00	1.10	R4,456,908	R1,046,016	R1,046,016	R1,046,016	R4,456,908	R4,456,908	R4,456,908	R4,456,908	R4,456,908	R4,456,908	R4,456,908	R4,456,908
13	Water management**	ha	R 37,783.13	**0.67**	1.10	R1,336,616	R51,023	R85,995	R106,690	R336,062	R2,207,884	R2,744,755	R2,744,755	R2,744,755	R2,744,755	R2,744,755	R2,744,755
14	2 to 3 years of maintenance & aftercare	ha	R 13,224.10	1.00	1.10	R1,419,739		R44,923	R55,733	R175,555	R1,153,372	R1,433,827	R1,433,827	R1,433,827	R1,433,827	R1,433,827	R1,433,827
						R90,097,949	**R3,542,890**	**R6,613,957**	**R7,587,663**	**R39,487,482**	**R71,907,667**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**
					(Sum of items 1 to 15 Above)												

CALCULATION OF THE QUANTUM							2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Mine:	Platreef	**Location:**	Mokopane, Limpopo Province														
Evaluators:	Digby Wells Environmental	**Date:**	12-Jan-16														
No.:	**Description: Class C (Low Risk)**	**Unit:**	**B**	**C**	**D**	**LoM**											
			Master rate	**Multiplication factor**	**Weighting factor 1**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**	**Amount (Rands)**
Weighting Factor 2 (step 4.4)			1		**Sub Total 1**	**R90,097,949**	**R3,542,890**	**R6,613,957**	**R7,587,663**	**R39,487,482**	**R71,907,667**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**	**R91,720,730**
Preliminary and General					6% of Subtotal 1	R5,405,877	R212,573	R396,837	R455,260	R2,369,249	R4,314,460	R5,503,244	R5,503,244	R5,503,244	R5,503,244	R5,503,244	R5,503,244
Contingency					10% of Subtotal 1	R9,009,795	R354,289	R661,396	R758,766	R3,948,748	R7,190,767	R9,172,073	R9,172,073	R9,172,073	R9,172,073	R9,172,073	R9,172,073
					Sub Total 2	**R104,513,621**	**R4,109,753**	**R7,672,191**	**R8,801,689**	**R45,805,479**	**R83,412,894**	**R106,396,047**	**R106,396,047**	**R106,396,047**	**R106,396,047**	**R106,396,047**	**R106,396,047**
(Subtotal 1 plus sum of management & administrative items, 1 to 6 above)																	
VAT (14%)						R14,631,907	R575,365	R1,074,107	R1,232,236	R6,412,767	R11,677,805	R14,895,447	R14,895,447	R14,895,447	R14,895,447	R14,895,447	R14,895,447
Grand Total (Subtotal 2 plus VAT)						**R119,145,528**	**R4,685,118**	**R8,746,297**	**R10,033,926**	**R52,218,247**	**R95,090,699**	**R121,291,493**	**R121,291,493**	**R121,291,493**	**R121,291,493**	**R121,291,493**	**R121,291,493**

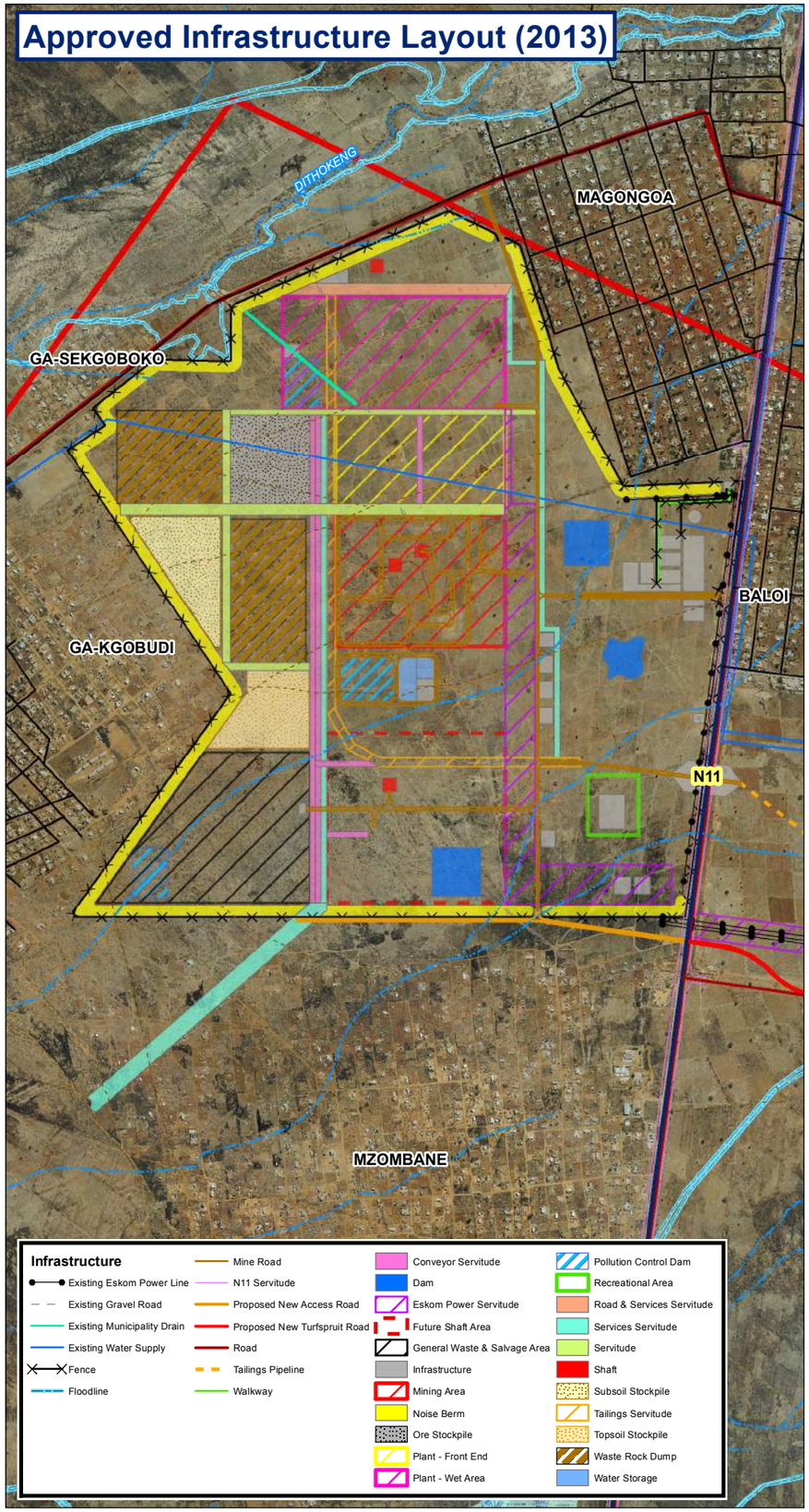
Appendix A: Layout Comparison

Plan 4

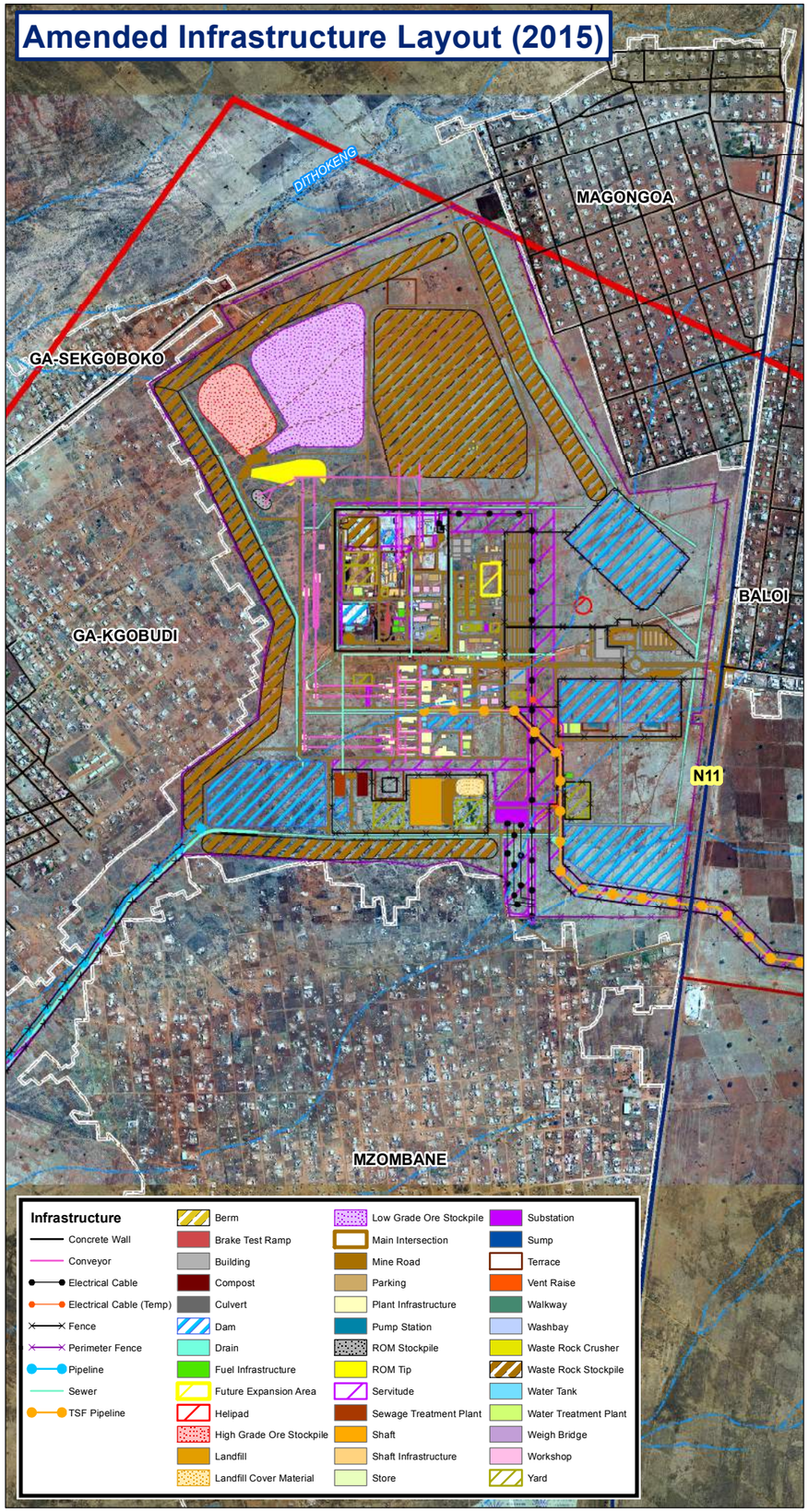
Ivanplats (Pty) Ltd

Comparative Layout

Approved Infrastructure Layout (2013)



Amended Infrastructure Layout (2015)



Legend

- Mining Right Area
- Arterial / National Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
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