

**DRAFT SCOPING REPORT FOR MATAI MINING (PTY) LTD MINING RIGHT APPLICATION FOR
VANADIUM, TITANIUM AND IRON ORE ON THE FARMS MAGAZYNSKRAAL 3 JQ, HAAKDOORN 6 LQ,
WILDEBEESTKUIL 7 JQ, SYFERKUIL 9 JQ, AND MIDDELKUIL 8 JQ WITHIN THE MAGISTERIAL DISTRICT
OF MANKWE, NORTH WEST PROVINCE**

SEPTEMBER 2018

DMR REFERENCE NUMBER: NW 30/5/1/2/2/10147 MR

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**DRAFT SCOPING REPORT FOR MATAI MINING (PTY) LTD MINING RIGHT APPLICATION
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HAAKDOORN 6 LQ, WILDEBEESTKUIL 7 JQ, SYFERKUIL 9 JQ, AND MIDDELKUIL 8 JQ
WITHIN THE MAGISTERIAL DISTRICT OF MANKWE**

NORTH WEST PROVINCE

Conducted on behalf of:

Matai Mining (Pty) Ltd

Compiled by:



Ayanda Mpofo (Cert. Sci. Nat)

Reviewed by:



C.G. Chigurah (Cert. Sci. Nat, IWMSA)

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ABBREVIATIONS AND ACRONYMS

%	Percent
°C	Degrees Celsius
<	Less than
>	Greater than
AMD	Acid Mine Drainage
BBKTA	Bakgatla-Ba-Kgafela Tribal Authority
BID	Background Information Document
BPDM	Bojanala Platinum District Municipality
CARA	Conservation of Agricultural Resources Act
cm	Centimetre
CR	Critically Rare
CSI	Corporate Social Investment
CSR	Corporate Social Responsibility
dB	Decibel
dBA	Decibels (Weighted)
DEA	Department of Environmental Affairs
DM	District Municipality
DMR	Department of Mineral Resources
DMS	Dense Medium Separation
DSO	Direct Shipping Ore
DWS	Department of Water and Sanitation

EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity analysis
EMP	Environmental Management Plan/Programme
EN	Endangered
ESR	Environmental Scoping Report
Fax	Facsimile
GDP	Gross Domestic Product
Ha	Hectare
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
IRR	Issues and Response Register
IWUL	Integrated Water Use License
IWULA	Integrated Water Use License Application
IWWMP	Integrated Water and Waste Management Plan
LED	Local Economic Development
LM	Local Municipality
LOM	Life of Mine
m	Metres

m ²	Square Meters
m ³	Cubic Metres
masl	Metres Above Sea Level
MKLM	Moses Kotane Local Municipality
MPRDA	Mineral and Petroleum Resources Development Act
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NEM: WA	National Environmental Management: Waste Act
NT	Near Threatened
NWA	National Water Act (Act No. 36 of 1998)
NWP	North West Province
PCD	Pollution Control Dam
PES	Present Ecological State
PPP	Public Participation Process
ROM	Run of Mine
S&EIR	Scoping and Environmental Impact Report
SAHRA	South African Heritage Resource Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency Limited
SANS 10103	South African National Standard 10103
SAWS	South African Weather Service

SDF	Strategic Development Framework
SLP	Social and Labour Plan
sms	Short Message Services
SWMP	Storm-water Management Plan
t	Tonne
WMA	Water Management Area
WULA	Water Use License Application

EXECUTIVE SUMMARY

Introduction

Matai Mining (Pty) Ltd is undertaking a mining right application process on the certain portion of farm Magazynskraal 3 JQ, certain portion of farm Haakdoorn 6 JQ, the farm Wildebeeskuil 7 JQ, certain portion of the remaining extent of portion 1, certain portion of the remaining extent of portion 2, certain portion of the remaining extent of portion 5, certain portion of 6, portions 11, 12 and 13 (portion of portion 2) and certain portion of the remaining extent of the farm Syferkuil 9 JQ, the remaining extent of portion 1, portion 2, portion 3 (a portion of portion 1), the remaining extent of the farm Middelkuil 8 JQ. The total mining right area is approximately 9 836.6652ha and the extent of the area required for infrastructure, roads and servitudes is approximately 70ha.

The mining right application is located within the Bakgatla Ba Kgafela Tribal Council and affects five (5) villages comprising of:

- a) Manamakgotheng
- b) Mononono
- c) Legogolwe
- d) Sefikile
- e) Lesobeng

Type of Minerals

Matai is applying for the following minerals:

- a) Iron Ore
- b) Vanadium
- c) Titanium

Proposed Mining Method

All mining blocks will be mined by means of conventional open pit mining method. Mining will be at an average stripping ratio of 3: 1. Topsoil and overburden from the initial mining block will be stockpiled at the positions indicated in the mine plan.

Opencast mining will take place through series of drill and blast, supported by conventional truck and shovel operation, assisted by roll-over dozing, to allow for continuous backfilling and rehabilitation of the mined-out area.

Legal Requirements

Matai mine will require various environmental approvals prior to commencement with construction or operational activities. Below is the list of applicable legislation and applications for the project.

1. Minerals and Petroleum Resources Development Act, (Act No 28 of 2008) (MPRDA)

An EIA process will be undertaken to determine the overall impact of mining to the environment. An Environmental Management Programme (EMPr) will be developed to manage the impacts. The EMPr, to be approved by the DMR, will be a legally binding document that cannot be amended without written consent from the Minister or his delegate.

2. National Environmental Management: Waste Act (Act No 59 of 2008) (NEM:WA)

In support of mining, waste management facilities will be required at the mine. A Waste management License application will be submitted to the Department of Mineral Resources with the following activities listed in GNR 718 included:

- a) Category B, Activity 10: Construction of facilities and associated structures and infrastructure (Processing Plant)
- b) Category B, Activity 11: Residue stockpiles or residue deposits (the establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)

3. National Water Act, No. 36 of 1998

In terms of the NWA, water uses must be authorized as per Section 21 of the Act. All applicable water uses will be applied through the DWS. The application will be consolidated as per NWA, Regulation 267.

4. National Environmental Management Act, (Act No 107 of 1998) (NEMA)

The EIA Regulations (GNR 983 to 985) published in terms of the NEMA, lists activities that

potentially could have a detrimental impact on the environment. Activities listed in the EIA

Regulations require environmental authorisation prior to commencement. The following listed activities will form part of the:

- a) “The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex” (GNR 984 Activity 9);
- b) The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres” (GNR 985 Activity 10(f));
- c) “The clearance of an area of 300 square metres or more indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan”. (GNR 985 Activity 12 (a))
- d) “The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014”. (GNR 983 Activity 13)
- e) “The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres”. (GNR 983 Activity 14)
- f) “The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- the undertaking of a linear activity; or maintenance purpose undertaken in accordance with a maintenance”. (GNR 984 Activity 15)
- g) “Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) including-Associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource; (GNR 984 Activity 17)
- h) “Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation,

refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.” (GNR 984 Activity 21)

- i) The development of- (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres (GNR 983 Activity 24ii)

Alternatives Considered

a) Activity Alternative

The proposed and preferred option to mine Vanadium, Titanium and Iron ore is thus far, the most preferred activity owing to the presence of these minerals within the proposed site. The mining opportunity will by far economically and socially empower and uplift the local communities. The land is presently utilised for agricultural purpose including grazing activities.

Furthermore, opencast mining method is the preferred option in comparison to underground mining. This is due to the shallow nature of Iron Ore, Vanadium and Titanium deposit that can easily be mined by means of opencast mining. Underground mining has a greater safety risk to the miners as compared to the open cast mining method. Underground mining method may be considered in future when the commodity priced get favourable and near surface resources are depleted.

b) Layout Alternative

The design or layout of the activity entails the consideration of the different options to place project mine. The site was selected based on the geographic location of the potentially underling required mineral reserves. The layout of the site was however selected based on considerations made for the surrounding environment where possible, ease of operations and mining activities on site as well as minimal disturbance to the community near the site. The site/land area for run of activity was selected based on the size (according to the geology of the area), and position and of the mineral reserves to be exploited. The preferred layout was more considered more importantly owing to the availability of the Vanadium, Titanium and Iron Ore minerals, the land ownership, the geo-hydrological impacts and the ease and available transport modes and routes therefore the proposed layout is therefore the most suitable and economically/environmental viable option for the open pit mining

c) Technology Alternative

The project will entail excavation of an open cast during mining of the identified minerals. Mining will be performed with the use of bulldozers, trucks, bowl scraper and shovel. Gyratory crushers are normally used in high capacity iron ore primary crushing applications as they are beneficial in cost and operation when the capacities are higher than what a single jaw crusher can handle, the civil and structural work becomes too expensive for lower capacities. The conveyor profiles were determined from the plant layout. Good engineering practice and industry accepted standards were used to calculate the conveyor widths and speeds for the various capacities. The conveyors include drives, idlers, pulleys, belting, take-ups, cleaners, steelwork, walkways, guards, and foundations. A tripper conveyor is proposed for the stacking method. In terms of the technologies proposed, these have been chosen based on their long-term success in terms of mining history, therefore no alternatives are indicated.

Public Participation Process

In meeting the minimum public participation guidelines, the following activities will be undertaken as part of stakeholder engagement:

- a) Identification of interested and affected parties
- b) Compilation of stakeholders' database
- c) Newspaper advertisements in the local and regional newspapers in both English and Setswana languages
- d) Putting up of site notices at strategic positions
- e) Written notification letters to state organs and neighbouring mining companies
- f) Distribution of BIDs
- g) Undertaking of consultation meetings with the affected villages and interested parties.
These meetings will be held to outline the details of the project to stakeholders and provide an opportunity for stakeholders to raise questions and indicate potential issues or risks associated with the project.
- h) Distribution of copies of the draft report.

Potential Impacts

The over-arching objective of the Scoping Phase is to identify record and describe the *potential* environmental impacts associated with the proposed project. This enables the specialist studies to clearly focus on aspects of significant concern. It also provides a framework for the assessment of the impacts that the proposed project will have on the environment, and of the impacts the environment will have on the proposed project. Based on inputs from the project team, stakeholders (I&APs) and specialists the environmental (biophysical and social) impacts the aspects in the list below have been identified as potentially relevant to the proposed development and will be investigated during the EIA phase of the process.

- a) Ecology
- b) Surface and groundwater
- c) Air Quality
- d) Traffic
- e) Visual
- f) Blasting and Vibration
- g) Noise
- h) Socio-Economic
- i) Heritage and Paleontology
- j) Soil and Land Use Capability

Conclusion

On conclusion of the public review of the draft Scoping Report, the report will be submitted to the DMR for acceptance, review and approval. The EIA Phase will then commence and will entail detailed investigations into the impacts identified and will serve also to guide the design processes for the project in-order to present the most environmentally feasible options for the proposed project.

Throughout the process stakeholders and I&APs will be engaged to ensure that their comments and concerns are taken into consideration and that they form an integral part of the environmental authorisation process

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1 INTRODUCTION

Matai Mining is the holder of the prospecting right NW 30/5/1/1/2/11277 PR granted and issued in terms of Section 11(1) of the Mineral and Petroleum Resources Development Act 28 of 2002 as amended by Act 49 of 2008 ("MPRDA"). The primary right NW 30/5/1/1/2/2679 PR was originally granted to Rise Africa Mining and Exploration (Pty) Ltd on the 06 December 2011 which remained in force up until 05 December 2013. Rise Africa Mining and Exploration (Pty) Ltd applied in terms of section 102 of the MPRDA to amend the granted right to include iron ore and titanium, the application was granted on the 8th of September 2013. Rise Africa Mining and Exploration (Pty) Ltd applied for renewal of the right on the 18th of October 2013 and was granted on the 26th of August 2015, with reference number: NW 30/5/1/1/2/11277 PR. Rise Africa Mining and Exploration (Pty) Ltd applied for ministerial consent in terms of section 11 of the MPRDA of 2002 to cede the same right in favour of Matai Mining the consent was approved on the 3rd of November 2014. Matai Mining at the time owned by Yanbing Zhang -74% and Jayamma Zhang 26%. Matai Mining applied for ministerial consent in terms of section 11 of the MPRDA to have change in the shareholding by disposing all shares owned by Yangbing Zhang and transfer them to Camp Brave Limited; and consent was approved on the 09th of November 2015. Matai Mining hereby apply for a Mining right in terms of the Section 23 (a), (b) and (c) read together with regulation 11(1) (g) of the MPRDA (ACT 28 of 2002).

The applicant must apply to the competent authority, Department of Mineral Resources for approval to proceed with the development. This document constitutes the Draft Scoping report, which forms part of the EIA process. After the scoping phase, specialist studies applicable to the project will be undertaken to investigate the potential impacts that may result from the proposed project and to formulate appropriate mitigation measures.

1.1 PROJECT LOCATION

The Matai Mining Project is located in the Moses Kotane Municipality, Bojanala Platinum District Municipality, North West Province, South Africa. It lies about 10km south from the closest town Northam, approximately, 80km north east of Rustenburg and 220km north west of Johannesburg, between the Pilanesberg Nature Reserve in the south (approx. 8km from the project), Pilanesberg Mines in the west (approx. 8km from the project) and Siyanda Resources Union Mine in the north (approx. 5km from the project). The project is approximately centred on Geographic coordinates Latitude 25° 00' 00" S, Longitude 27° 10' 00" E.

Matai Mining is applying for a mining right on the farms, certain portion of farm Magazynskraal 3 JQ, certain portion of farm Haakdoorn 6 JQ, the farm Wildebeeskul 7 JQ, certain portion of the remaining extent of portion 1, certain portion of the remaining extent of portion 2, certain portion of the remaining extent of portion 5, certain portion of 6, portions 11, 12 and 13 (portion of portion 2) and certain portion of the remaining extent of the farm Syferkuil 9 JQ, the remaining extent of portion 1, portion 2, portion 3 (a portion of portion 1), the remaining extent of the farm Middelkuil 8 JQ.

1.2 NEMA PUBLIC PARTICIPATION PROCESS

Public Participation Process (PPP) was undertaken with the intent of informing key local communities (directly affected people) about the proposed development and the scoping process underway. Public participation plays an important role in the compilation of environmental reports as well as the planning, design and ultimately the implementation of the project.

This scoping report sets out the proposed scope of the Environmental Impact assessment (EIA) that will be undertaken for the proposed mine. This includes the range of the alternatives that will be evaluated for various aspects of the project, the key environmental impacts and issues that need to be addressed, the specialist studies that will be undertaken, terms of reference of the specialist studies and the qualifications and experience of the study team. This scoping report will be updated after the public consultation, based on the comments received, finalized and submitted to the competent authority and other commenting authorities for comment and approval.

2 CONTACT PERSON AND CORRESPONDENCE ADDRESS

2.1 Details of The EAP who prepared the report

Name of the Practitioner:

Name And Surname	Charles Chigurah
Name Of Company	Kimopax Pty Ltd
Telephone Number	011 312 9765
Fax Number	011 312 9768
Email Address	charles@kimopax.com

2.2 Expertise of the EAP.

a) The qualifications of the EAP

(With evidence attached as APPENDIX B).

B.Sc. Hons. Geography and Environmental Studies
Post Graduate Diploma in Water Supply and Sanitation

b) Summary of the EAP's past experience.

(Attach the EAP's curriculum vitae as

APPENDIX C)

Charles Chigurah holds an honours degree in Environmental Management from the Midlands State University in Zimbabwe. Postgraduate Diploma in Water Supply and Sanitation from the Institute of Water Supply, Sanitation and Development in Zimbabwe. He holds SAMTRAC and he is currently finalizing his NEBOSH International Diploma in Occupational Safety and Health. He is a Senior SHE Consultant and a member of International Association of Impact Assessors (IAIA), South African Council for Natural Scientific Professions (SACNASP). Charles is a member of Institute of Waste Management in Southern Africa (IWMSA) and he is registered with the South African Council for Project and Construction Management Professions (SACPCMP) as a Construction Health and Safety Manager (CHSM). He has more than 9 years working experience in the field of Construction, Waste Management, Environmental Management and Environmental Management Systems (EMS) Implementation and Auditing and has published a paper in Geographical Information Systems (GIS) and Remote Sensing. He has worked on a number of municipality projects and herewith is selected few completed projects:

- a) Integrated Waste Management Plan for Nkonkobe Local Municipality
- b) Integrated Waste Management Plan for Tokologo Local Municipality
- c) Integrated Environmental Management Plan for Xhariep District Municipality
- d) Environmental Management Framework for Amajuba District Municipality

e) Integrated Waste Management Plan for Tubatse-Fetakgomo Local Municipality

Apart from doing municipality projects, Charles has also managed more than fifty (50) Environmental Impact Assessment Projects both in Zimbabwe and South Africa. He has also worked as a Construction SHE Advisor and Consultant on a number of major construction projects across South Africa, among them include the construction of multi-storey buildings in Mpumalanga and Limpopo Provinces; the construction of gas pipelines for Sasol in Gauteng, the construction and upgrades of road networks in Limpopo Province as well the construction and upgrades of Bulk Water and Sewer Systems for Ekurhuleni Metropolitan Municipality and was also a Safety Advisor for Eskom Hendrina Power Station responsible for managing sub-contractor's safety officers.

3 DESCRIPTION OF THE PROPERTY.

Table 1: Details of properties under the application

Farm Name:	<ul style="list-style-type: none"> a) Certain portion of Magazynskraal 3 JQ, b) Certain portion of Haakdoorn 6 JQ, c) Farm Wildebeestkuil 7 JQ d) Certain portions of remaining extents of portion 1, 2 and 5, certain portion of portion 6, portions 11, 12, and 13 (portions of portion 2), certain portion of the remaining extent of the farm Syferkuil 9 JQ, e) Remaining extent of portion 1, portion 2, portion 3 (a portion of portion 1) and the remaining extent of the farm Middelkuil 8 JQ.
Application area (Ha)	9836.6652 Ha
Magisterial district:	Mankwe Magisterial District
Distance and direction from nearest town	Approximately 80km North East of Rustenburg (North West Province) and 10 km South of Northam

21digit Surveyor General Code for each farm portion		
	Middelkuil 8JQ	
	Remaining Extent	T0JQ0000000000080000
	Portion 1	T0JQ0000000000080001
	Portion 2	T0JQ0000000000080002
	Portion 3	T0JQ0000000000080003
	Wildebeestkuil 7JQ	T0JQ0000000000070000
	Haakdoorn 6JQ	T0JQ0000000000060000
	Magazynskraal 3JQ	T0JQ0000000000030000
	Syferkuil 9JQ	
	Remaining Extent	T0JQ0000000000090000
	Portion 1 (RE)	T0JQ0000000000090001
	Portion 2 (RE)	T0JQ0000000000090002
	Portion 5 (RE)	T0JQ0000000000090005
	Portion 6	T0JQ0000000000090006
	Portion 11	T0JQ0000000000090011
	Portion 12	T0JQ0000000000090012
	Portion 13	T0JQ0000000000090013

Land tenure and use of immediately adjacent land

The owners of the farm portions immediately adjacent to the Matai Mining site are listed in the Table 2 below. The adjacent land is mostly used for agricultural activities.

Table 2: Adjacent land owners of the site

Farm name	Portion number	Full names of owner	Title Deed Number	Contact details and address
Haakdoorn 6 JQ	Portion 6	National Government Republic of South Africa	T5990/1937B P	N/A
Wildebeestkuil 7 JQ	Portion 7	No Information available	-	
Magazynskraal 3 JQ	Full Farm	National Government Republic of South Africa	T34032/1946 BP	N/A
Syferkuil 9 JQ	Portion 0	S A Native Trust	T5780/1937B P	N/A
	Portion 1	Republic of Bophuthatswana	T6932/1937B P	N/A
			T454/1979BP	
			T6933/1937B P	
			T455/1979BP	
	Portion 2	SA Native Trust	T5780/1937B P	N/A
		Evraz Highveld Steel & Vanadium Ltd	-	
Portion 12	No Information available	-		

Farm name	Portion number	Full names of owner	Title Deed Number	Contact details and address
Middelkuil 8 JQ	Portion 1	National Government of the Republic of South Africa	T27247/1954 BP	N/A
		Bakgatla-Ba-Kgafela Tribe	T28/1988BP	
		Republic of Bophuthatswana		
		Bakgatla-Ba-Ga Kgafela Stam		
	Portion 2	Nomaele Moses Ramphotho	T9287/1969B P	N/A
	Portion 0 (RE)	South African Native Trust	T18759/1937 BP	
		National Government of the Republic of South Africa	T3712/1972B P	
		National Government of the Republic of South Africa	T71853/2009	
	Portion 8	No Information available		

3.1 Locality Map

(Show nearest town, scale not smaller than 1:250000)

The locality of the proposed Matai Mining area is presented in Figure 1 below. The map shows the the farm portions on which the proposed activity will take place as well as the adjacent farm portions that may be affected by mining activities.

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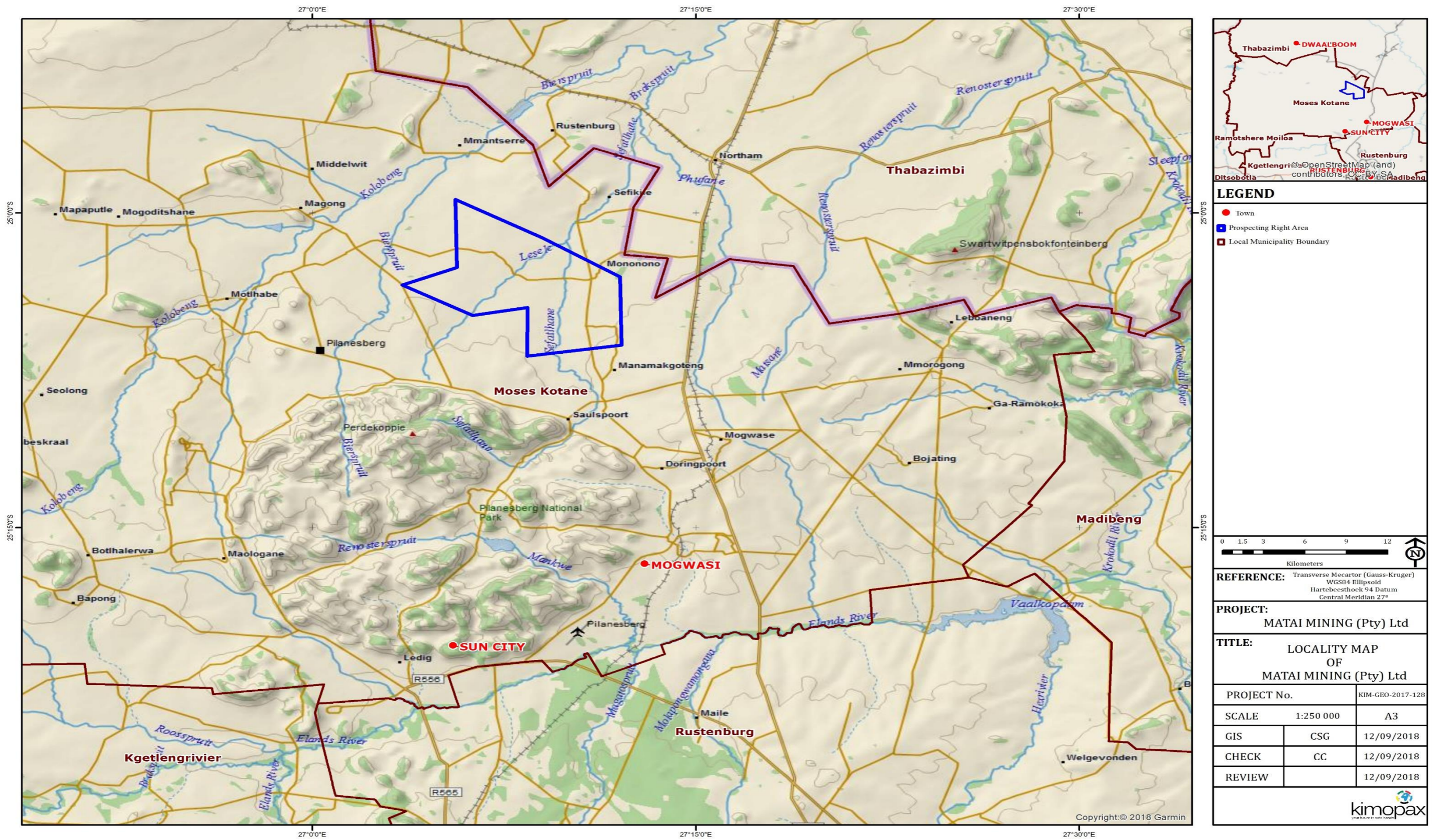


Figure 1: Locality Map

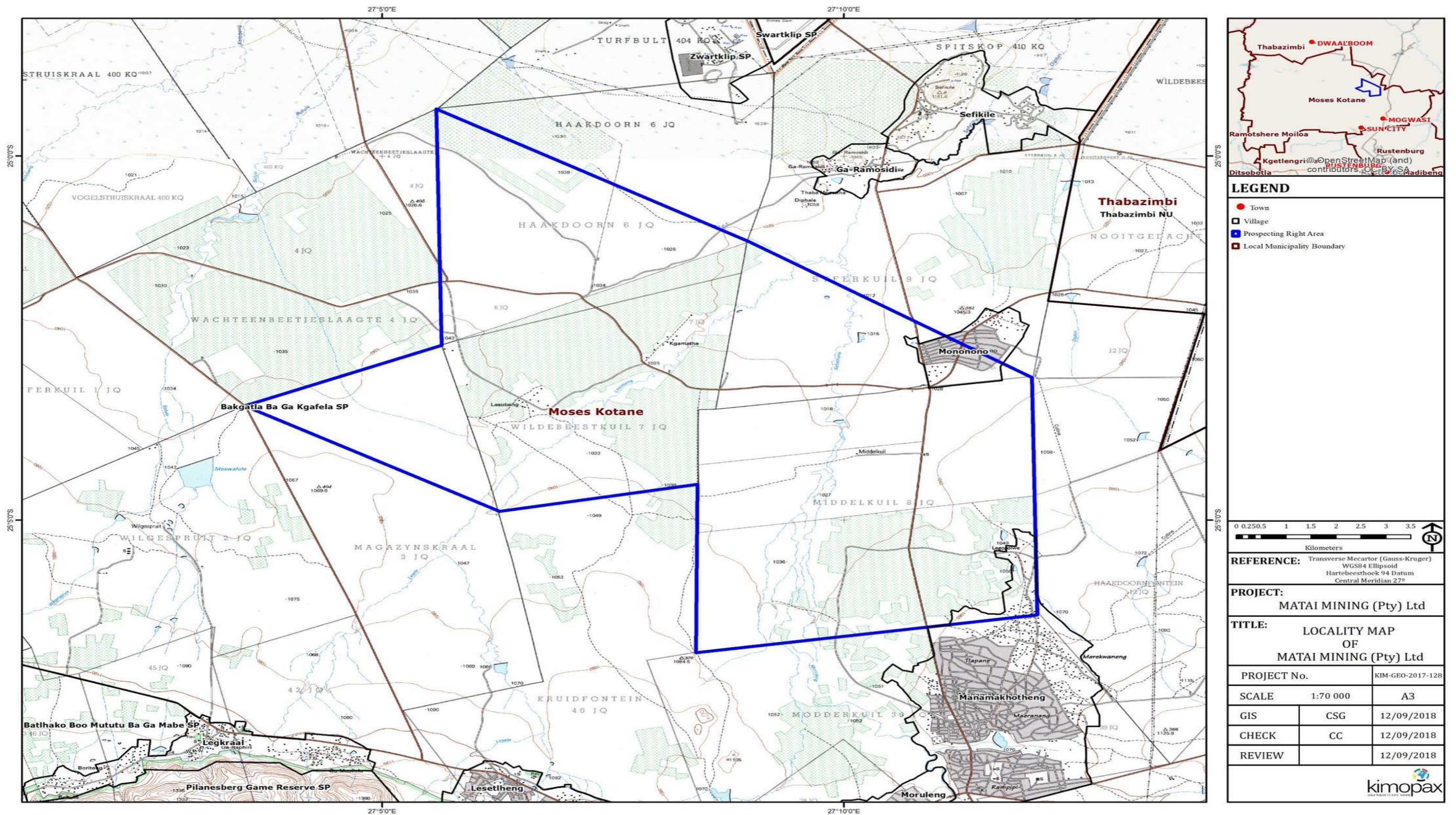


Figure 2: Locality of property and surrounding areas

4 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.

4.1 Listed and specified activities

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

Table 3: Listed and Specified Activities

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
Powerline “The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex”.	0.5 Ha	X	GNR 984 Activity 9
Processing plant “Construction of facilities and associated structures and infrastructure (the construction of a facility for a waste	0.5 Ha	X	GNR 178 Category B Activity 10

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
management activity listed in Category B of this Schedule not in isolation waste management)".			
Storage "The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres".	0.5Ha	X	GNR 985 Activity 10 (f)
Stockpiles "Residue stockpiles or residue deposits (the establishment or reclamation of a residue stockpile or residue deposit resulting from activity which require a mining right, exploration right or production right in terms of the Mineral	5 Ha	X	GNR 178 Category B Activity 11

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)".			
Excavations "The clearance of an area of 300 square metres or more indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan".	70 Ha	X	GNR 985 Activity 12 (a)
Storage "The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014".	0.2ha	X	GNR 983 Activity 13

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
Hazardous Storage “The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres”.	0.2ha		GNR 983 Activity 14
Excavations “The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- The undertaking of a linear activity; or Maintenance purpose undertaken in accordance with a maintenance”.	70 Ha	X	GNR 984 Activity 15
Processing plant	0.5Ha		GNR 984

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
“Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) including- Associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource; or...”		X	Activity 17
Processing plant “Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral	0.5 Ha	X	GNR 984 Activity 21

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
resource in which case activity 6 in this Notice applies.”			
<p>Planned road</p> <p>“The development of- (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</p>	1.5 Ha	X	<p>GNR 983</p> <p>Activity 24 (ii)</p>

4.2 Description of the Activities to be Undertaken

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

4.3 Activities to be undertaken by Matai Mining (Pty) Ltd

Matai Mining is applying for a mining right on the farms, certain portion of farm Magazynskraal 3 JQ, certain portion of farm Haakdoorn 6 JQ, the farm Wildebeeskuil 7 JQ, certain portion of the remaining extent of portion 1, certain portion of the remaining extent of portion 2, certain portion of the remaining extent of portion 5, certain portion of 6, portions 11, 12 and 13 (portion of portion 2) and certain portion of the remaining extent of the farm Syferkuil 9 JQ, the remaining extent of portion 1, portion 2, portion 3 (a portion of portion 1), the remaining extent of the farm Middelkuil 8 JQ.

4.3.1 Mining Method

The project will entail excavation of an open cast during mining of the identified minerals. The proposed mining method commences with a box cut. Opencast mining is also known as an open-pit mining, open-cut mining, and strip mining, which basically refers to a method of extracting rock or minerals from the earth by removing the material from an open-pit. This activity will result in the transformation of the proposed site to mining use. The proposed site will be cleared off vegetation, followed by the removal of topsoil and the blasted overburden material. Mining will be performed with the use of bulldozers, trucks, bowl scraper and shovel. The stockpile will be stockpiled for later transportation to the rehabilitation area so that it can be used promptly to avoid prolonged stockpiling of the soil and due to minimal availability of topsoil. The topsoil and overburden will be stockpiled separately. A rollover mining technique will be practised, in such a case the topsoil and overburden from the initial cut of the opencast mine are stockpiled at the position of the final cut. As the opencast mine progresses, the overburden and topsoil from each successive cut will be backfilled into the void from the previous cut, the surface will then have shaped to be free from draining, topsoil will be analysed and treated appropriately, and the surface will be fertilised and revegetated with locally indigenous species of grass, shrubs and trees. Figure 3 shows an illustration of a cross section of an open cast mining site.

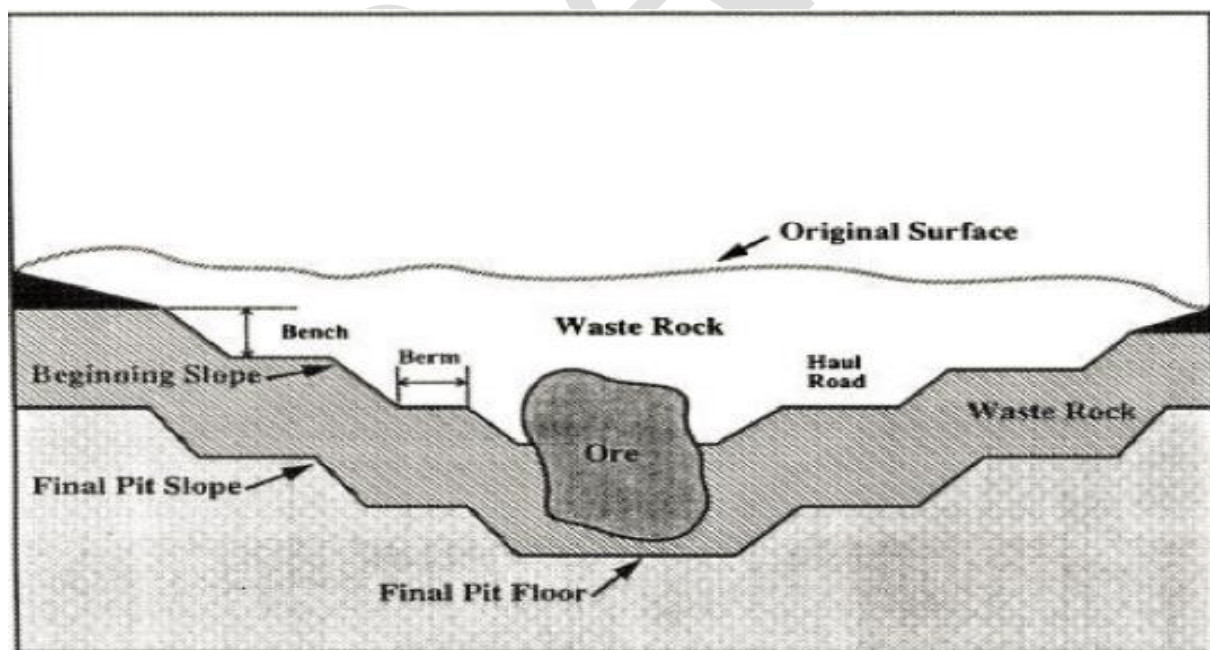


Figure 3: Schematic illustration of an open cast mining

Based on the requirement for a 2mtpa ROM feed and a simple lumpy DSO product without beneficiation, it is assumed that a typical iron ore ROM feed size distribution and a simulated a three-stage crushing, and screening circuit is viable as defined in the attached block flow.

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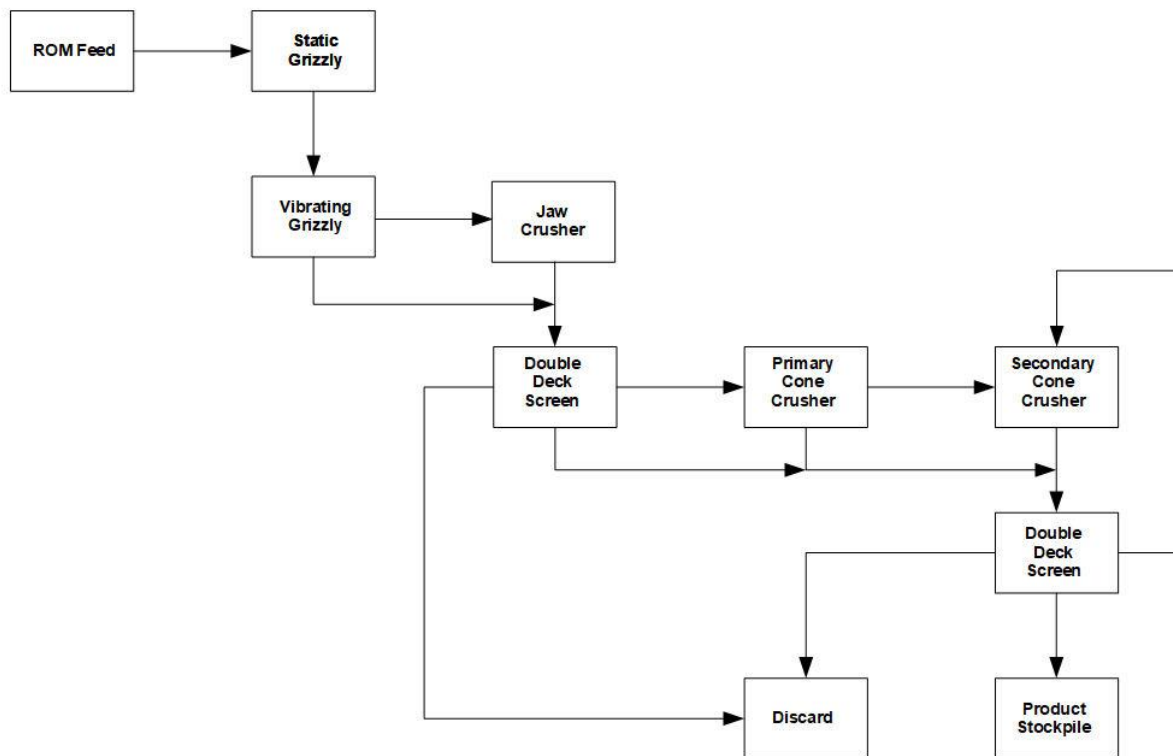


Figure 4: Ore processing flowchart

The ROM feed of 517tph includes about 40.6tph of -6 mm material and after three stages of crushing a further 59.6tph of -6 mm material is generated. The lumpy product of -32mm and +6mm amounts to an estimated 416.8 tph or 80.6% of ROM feed. This figure will be confirmed through additional crushing test work.

4.3.2 Pit Design

Datamine was used for the pit design using the optimum pit shell from Whittle as a guide. This was based on viewing the shell in horizontal planes at increments common with mining benches spaced at intervals that were determined by a bench height of 10m. The LOM permanent pit ramps were iteratively positioned to find the optimum starting point. Benches and associated ramps were designed progressively from the bottom up.

The base of the pit was designed to accommodate a minimum mining width of 20m was used to ensure efficient manoeuvrability of the loading equipment in conjunction with the trucks. The average pit width and length will be approximately 400m and 250m respectively with a depth of 110m.

4.3.3 Dump Design

The objective of waste dump designs is to ensure that all the waste within the ultimate pit limit can be accommodated throughout the life of the operation. The dumps were designed with a lift height of 10m, a 35° face angle and a step-back of 10m between benches.

4.3.4 Apron Feeder

Apron feeders are very rugged in design and are commonly used in iron ore applications. They are used to extract ore from bins at a predetermined rate and can handle impact loadings as is prevalent from intermittent truckloads being deposited into the receiving bin at the primary tip. The length of the apron feeder will be determined from the layout while the width and power factors will be calculated from the required capacity and speed.

4.3.5 Crushers

Gyratory crushers are very commonly used in high capacity iron ore primary crushing applications as they are beneficial in cost and operation when the capacities are higher than what a single jaw crusher can handle, the civil and structural work becomes too expensive for lower capacities. A single jaw crusher is the preferred option in a lower production requirement.

A single jaw crusher (Metso C140) with a capacity of 750mm, top size, was selected as the primary crusher. A static grizzly is placed at the primary tip to remove oversize material, with a vibrating grizzly placed before the crusher to screen off the fines before it enters the crusher. Secondary and tertiary crushing is required to reduce the size of the material to less than 32mm. Cone crushers are commonly used for this application, but it will have to be confirmed whether the technology is suitable for this ore through further test work. Toothed roll crushers and mineral sizers are ideal to minimise fines but can only handle soft to medium hard type ores. Cone crushers were selected for the secondary open circuit and closed-circuit tertiary crushing applications. The tertiary crusher has a high capacity requirement due to the re-circulating load.

4.3.6 Conveyors

The conveyor profiles were determined from the plant layout. Good engineering practice and industry accepted standards were used to calculate the conveyor widths and speeds for the various capacities. The conveyors include drives, idlers, pulleys, belting, take-ups, cleaners, steelwork, walkways, guards, and foundations

4.3.7 Stockpile stacking and reclaiming

Various methods exist for stacking and extracting material from the stockpile, each with its' own advantages and disadvantages. In the effort to reduce the capital, a tripper conveyor is proposed for the stacking method. The mechanical components cost is essentially equivalent as for a conventional conveyor. Additional steel and civil work are required to extend the conveyor over the stockpile.

Bottom extraction was selected as the reclaim method of the stockpile. A tunnel underneath the stockpile houses a travelling rotary plough feeder and a conveyor. The capital required for this method is less than a conventional bucket or drum re-claimer, but more civil work is required due the construction of the tunnel. Due to the size of the operation, a small stacker/ re-claimer might be a viable alternative solution and should be investigated further.

4.3.8 Water supply

It is assumed that sufficient make-up water will be supplied to the perimeter of the plant area, either from municipal supply or other nearby water sources. Holding and settling dams are required to contain the water for water distribution.

4.3.9 Power Supply

It is assumed that sufficient power will be supplied at the perimeter of the plant area. The onsite power distribution will be done from the incoming substation through step-down transformers and via electrical reticulation to the various plant MCC's. Provision is included for a backup generator.

4.3.10 Access and Plant Roads

Secure access and fencing were included for the plant area, with access control via a single gate with guard houses and booms. 8m wide with 4m wide lanes were provided dual purpose roads and working areas within the main plant area. These will be as gravel surfaced roads. The final layer (wearing course) will comprise a suitable gravel material for plant type roads.

4.3.11 General Buildings

General buildings will be built for the plant and general administration sections. All visitors and employees of the mine will need to report to the security clearance area in the administration complex on arrival at the mine. Public buses and cars have access to the bus terminus and visitor parking areas respectively. All other access will be controlled by the security guard station with access control booms.

There will be a training section and clinic adjacent to the security offices for induction and training purposes, including emergency medical response. Once personnel or visitors have passed through security, they have immediate access to the plant change house facility or canteen. Personnel on lunch break or returning from their shift again have access to the canteen or change house facility before passing back through the security gates and returning home.

The plant and administrative offices are located across the road from the change house and canteen, with the possibility of direct road access via one of the gate-controlled access points with authorised plant vehicles. The road passes in front of the plant offices (with dedicated parking adjacent to the office building), continues first to the plant services area, and then to the various plant operational areas.

The plant services area contains the plant stores, capital spares yard/ laydown area and plant workshop (mechanical and electrical). All brick buildings are single-storey semi face brick buildings, with inverted box rib ("IBR") galvanized roof sheeting. Internal walls are plastered and painted. All floors are tiled or covered with raised computer flooring.

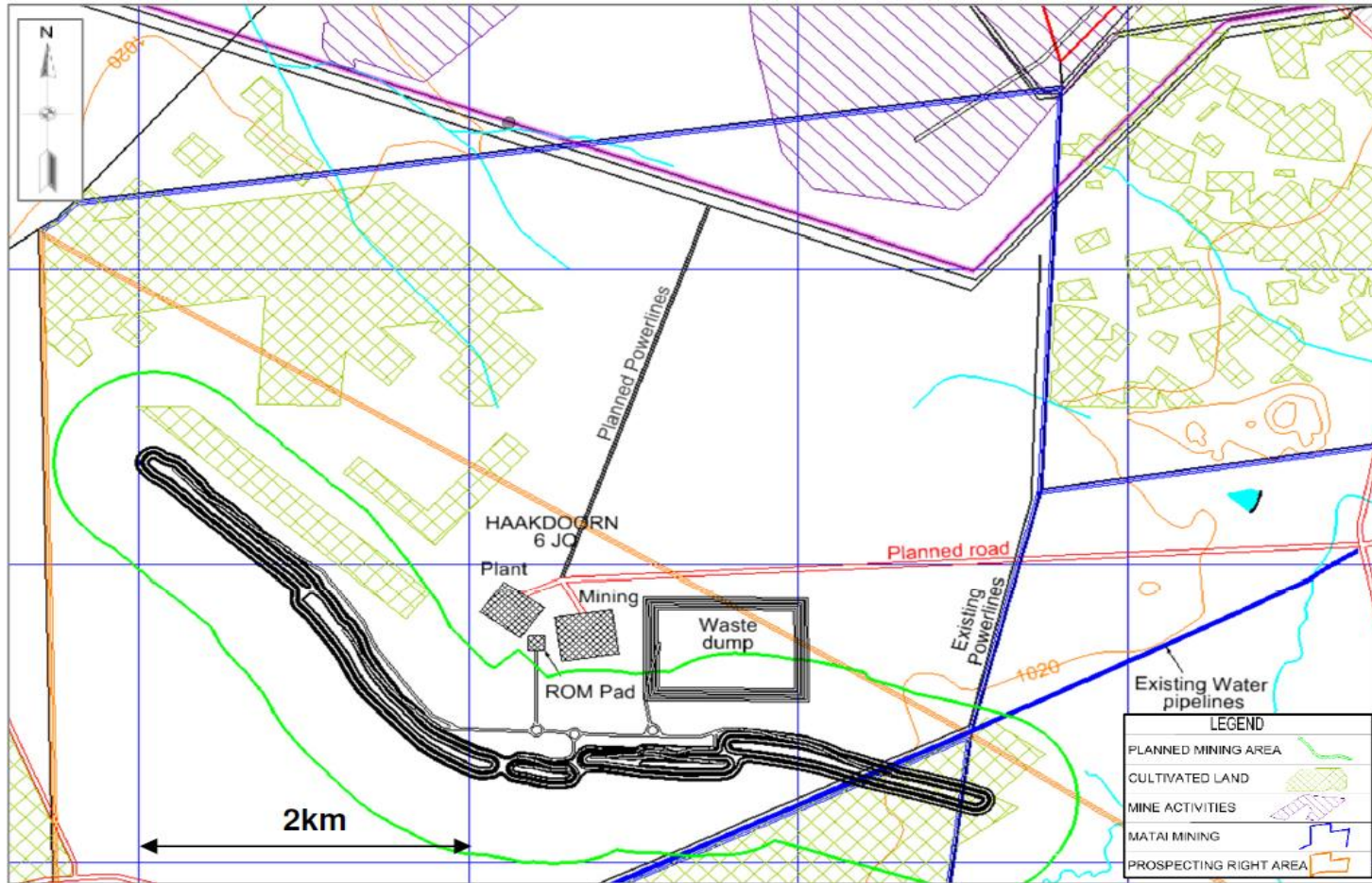


Figure 5: Surface mine layout

5 POLICY AND LEGISLATIVE CONTEXT

Table 4: Policy and Legislative context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED
<p>The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996).</p>	<p>The Bill of Rights, in the Constitution of South Africa (No. 108 of 1996), Section 24 states that everyone has a right to an environment that is not harmful to health and wellbeing and requires that reasonable measures are applied to protect the environment. This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development. These principles are embraced in NEMA and given further expression. The development will ensure that as little damage as possible will be left on the surrounding environment and local community. This report is drafted to ensure compliance to this piece of legislation.</p>

<p>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)</p>	<p>REFERENCE WHERE APPLIED</p>
<p>National Environmental Management Act (Act 107 of 1998) (NEMA). The Environmental Impact Assessment Regulation GNR. 982 dated 04 December 2014 as amended in April 2017.</p>	<p>The National Environmental Management Act (Act 107 of 1998 as amended on the 8th of December 2014) (NEMA) and the Regulations and associated listed activities identified under Regulations 982, 983, 984 and 985, is the key national legislation underpinning environmental Authorisations in South Africa.</p> <p>NEMA requires that environmental authorisation is obtained for any development activity prior to its commencement. The Act requires that all environmental impacts (including social impacts) due because of the development are assessed and where possible, minimised or mitigated.</p> <p>NEMA and associated regulations are directly relevant to this authorisation Application</p>
<p>Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)</p>	<p>Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) including-</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED
	Associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
Occupational Health and Safety Act (No. 85 of 1993)	The employer needs to manage his/her staff and crew in strict accordance with the Occupational Health and Safety Act in order to prevent injuries to the staff.
National Water Act (Act 36 of 1998) (NWA).	<p>In terms of Chapter 4 of the NWA, activities and processes associated with the proposed mine and associated infrastructure, are required to be licensed by the Department of Water and Sanitation (DWS). The National Water Act, 1998 (Act No. 36 of 1998) (NWA) is primary legislation regulating both the use of water and the pollution of water resources.</p> <p>An Integrated Water Use Licence Application (IWULA) will be lodged with the DWS in terms of</p>

<p>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)</p>	<p>REFERENCE WHERE APPLIED</p>
	<p>Section 21 of the NWA, which lists several water uses requiring authorisation.</p> <p>Matai Mining’s proposed mining operations involves the following water uses: under section 21: a) taking water from a water resource; c) impeding or diverting the flow of water in a watercourse; disposing of waste in a manner which may detrimentally impact on a water resource; f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; g) disposing of waste in a manner which may detrimentally impact on a water resource i) altering the bed, banks, course or characteristics of a watercourse; and j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.</p>
<p>National Environmental Management Waste (No 59 of 2008) (NEM: WA).</p>	<p>In terms of section 18, Schedule 3 of the National Environmental Management: Waste Amendment Act, 2014 (Act No. 26 of 2014) (NEMWAA), by default the mining residues are classified as</p>

<p>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)</p>	<p>REFERENCE WHERE APPLIED</p>
	<p>hazardous wastes. According to the Regulations GN R.632 and R.633, that was inaugurated on the 24 of July 2015, the mining residues must be characterised and classified, and the design and management of residue stockpiles and deposits must be based on an assessment of the potential impacts and risks.</p>
<p>National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004).</p>	<p>The objectives of the Act are to reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.</p>
<p>National Environmental Management: Biodiversity Act (No. 10 of 2004).</p>	<p>The Act identifies that all people and organizations should act with due care to conserve and avoid negative impacts on</p>

<p>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)</p>	<p>REFERENCE WHERE APPLIED</p>
	<p>biodiversity, and to use biological resources sustainably, equitably and efficiently. Biodiversity is defined to include “the number and variety of living organisms on earth, the millions of plants, animals, and microorganisms, the genes they contain, the evolutionary history and potential they encompass, and the ecosystems, ecological processes and landscapes of which they are integral parts. Biodiversity thus refers to the life-support systems and natural resources upon which we depend”.</p> <p>The National Environmental Management: Biodiversity Act provides for: The sustainable usage of resources, the fair and equitable sharing benefits arising from the use and application of genetic resources and material and the management and conservation of the biological diversity of South Africa.</p>
<p>National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003 as amended)</p>	<p>To provide for the protection and conservation of ecologically viable areas representative of South</p>

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED
	Africa's biological diversity and its natural landscapes.
Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983) (CARA)	CARA provides for control over the utilization of the natural agricultural resources of the Republic of South Africa to promote the conservation of soil, water sources and vegetation and the combating of weeds and invader plants.
Restitution of Land Rights Act, 1994, Land Reform (Labour Tenants) Act, 1996 and the Extension of Security of Tenure Act, 1997	Department of land affairs confirmed that there are no existing claims on the affected properties.
National Heritage Resources Act (Act 25 of 1999).	The National Heritage Resources Act requires all developers (including mines) to undertake cultural heritage studies for any development exceeding 0.5 ha. It also provides guidelines for impact assessment studies to be undertaken where cultural resources may be disturbed by development activities.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED
	The document will be approved by The South African Heritage Resources Agency (SAHRA) as part of the impact assessment process.
Promotion of Access to Information Act, 2000 (Act 2 of 2000 as amended)	To give effect to the constitutional right of access to any information held by the State and an information that is held by another person and that is required for the exercise or protection of any rights.
National Development Plan (NDP)	The Province of North-West published its latest Provincial Development Plan (PDP) in 2016. This document is aimed at interventions to eliminate poverty and social inequality by 2030.
Bojanala Platinum District Municipality (BPDM) Integrated Development Plan (IDP) (2012/2017)	To ensure a better life for all communities through local economic development and job creation.
Moses Kotane Local Municipality (MKLM) Integrated Development Plan (IDP) (2016/17)	Its strategy to address the main causes of unemployment and poor economic development must focus on a number of sectors, amongst the few mentioned is the mining sector.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED
Environmental Management Frameworks (BPDM) and Environmental Management Frameworks (MKLM)	The MKLM and BPDK EMF share the common goal of balancing economic development, social development and environmental resource management.
Spatial Development Framework (MKLM)	To ensure sustainable Spatial Development with integrated human settlement.

Please note, the applicable legislation and guidelines are not only limited to the above mentioned.

6 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

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

The mining project forms part of a larger scheme for the alleviation of poverty within the local municipality, which will not only improve the living standards for several previously disadvantaged communities, but also potentially allow for the future development of this area.

The project will provide positive impacts in the form of employment opportunities and skills development, skills transfer and ultimately resulting to Gross Domestic Product (GDP) growth, therefore eradicating poverty in such a case stimulating Local Economic Development. Not only that, the business opportunities will be encouraged through infrastructural development such as roads will be constructed, this will assist in increasing the demand for goods and services in the affected area/s in a long term. According to the outcomes of the IDP Moses Kotane (2016 -2021), community consultation meetings

conducted, the main issue that was raised was the need for Local Economic Development, with unemployment as the main concern highlighted in all the different wards within the local Municipality. In the strive to poverty alleviation, the municipality greatly consider employment generation as a required tool and might be achieved through developments similar to the proposed mining project.

Since the local labour from adjacent farm communities such as Manamakgotheng, Legogolwe, Lesobeng, Mononono and Sefikile will be employed by the mine. This will have a positive impact on the wellbeing of employees with a multiplier effect on households of the employed. Moreover, the business opportunities will be encouraged through infrastructural development such as roads will be constructed, this will assist in increasing the demand for goods and services in the affected area/s in a long term. All these factors will be enhanced throughout this process.

The economic use of the products that will be mined are discussed below:

Vanadium

Titanium alloys, it is a catalyst notably in the manufacturing of sulphuric acid. Moreover, in combination with niobium, these elements are added to steel to increase tensile strength through precipitation hardening.

Iron Ore

Iron is primarily used to make steel which is used in the manufacturing of automobiles, locomotives, ships, beams used in buildings, furniture, paper clips, tools, reinforcing rods for concrete, bicycles etc, therefore the need of Iron mining remains high and can only be fulfilled through mining of ore.

Titanium

Moreover, due to titanium's low density and ability to withstand extreme temperatures it is used as an alloying agent with many metals including aluminium, molybdenum and iron. It is mainly used in aircraft, spacecraft, missiles, watches and laptop computers.

6.1 Period for which the environmental authorisation is required

It is anticipated that the Life of Mine (LoM) will be at least 30 years. Further decommissioning will also be required after this date.

- a) 1st year-Construction phase
- b) 2-28 years-operational phase
- c) 1-2 years-Decommissioning and closure

7 DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE.

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

Mining on its own is resource base and therefore constrained on the mineralized site, therefore can take place only within the area for which a mining right is obtained and no alternative site for mining is possible. Several alternative sites and layouts for the supporting infrastructure are possible and may be explored, taking into consideration economic viability, practicality and environmental characteristics.

7.1 Details of all alternatives considered.

With reference to the site plan provided as APPENDIX E and the location of the individual activities on site, provide details of the alternatives considered with respect to:

The property on which or location where it is proposed to undertake the activities:

- a) The type of activity to be undertaken;***
- b) The design or layout of the activity;***
- c) The technology to be used in the activity;***
- d) The operational aspects of the activity; and***
- e) The option of not implementing the activity.***

The intension of identifying alternatives in the Matai proposed project is to provide a basis for choice among other options available. It should be noted that the examination of these alternatives will allow for the incorporation of more practical, feasible, relevant, reasonable, technologically and the least

environmentally impacting options available, and reducing or avoiding potentially significant negative impacts at the same time meeting the need and purpose of the proposed projects.

As per the Department of Environmental Affairs (DEA) Criteria for Determining Alternatives in EIA Guideline (2004), the types or categories of alternatives, including:

7.2 Activity Alternative

The proposed and preferred option to mine Vanadium, Titanium and Iron ore is thus far, the most preferred activity owing to the presence of these minerals within the proposed site. The mining opportunity will by far economically and socially empower and uplift the local communities. The land is presently utilised for agricultural purpose including grazing activities.

Furthermore, opencast mining method is the preferred option in comparison to underground mining. This is due to the shallow nature of Iron Ore, Vanadium and Titanium deposit that can easily be mined by means of opencast mining. Underground mining has a greater safety risk to the miners as compared to the open cast mining method. Underground mining method may be considered in future when the commodity priced get favourable and near surface resources are depleted.

7.3 Layout Alternative

The design or layout of the activity entails the consideration of the different options to place project mine. The site was selected based on the geographic location of the potentially underling required mineral reserves. The layout of the site was however selected based on considerations made for the surrounding environment where possible, ease of operations and mining activities on site as well as minimal disturbance to the community near the site. The site/land area for run of activity was selected based on the size (according to the geology of the area), and position and of the mineral reserves to be exploited. The preferred layout was more considered more importantly owing to the availability of the Vanadium, Titanium and Iron Ore minerals, the land ownership, the geo-hydrological impacts and the ease and available transport modes and routes therefore the proposed layout is therefore the most suitable and economically/environmental viable option for the open pit mining.

7.4 The technology alternative;

The project will entail excavation of an open cast during mining of the identified minerals. Mining will be performed with the use of bulldozers, trucks, bowl scraper and shovel. Gyratory crushers are normally used in high capacity iron ore primary crushing applications as they are beneficial in cost and operation

when the capacities are higher than what a single jaw crusher can handle, the civil and structural work becomes too expensive for lower capacities. The conveyor profiles were determined from the plant layout. Good engineering practice and industry accepted standards were used to calculate the conveyor widths and speeds for the various capacities. The conveyors include drives, idlers, pulleys, belting, take-ups, cleaners, steelwork, walkways, guards, and foundations. A tripper conveyor is proposed for the stacking method.

In terms of the technologies proposed, these have been chosen based on their long-term success in terms of mining history, therefore no alternatives are indicated.

7.5 Operation aspects of the activity

The operations of the proposed mining involve the open cast mining, the processing plant, pollution control dams, workshops, material stockpiles, storage, excavations, access roads diesel and wash bays. No feasible alternative operational aspect methods currently exist.

7.6 The option of not implementing the activity.

Should the mining right application be rejected, there will be a significant loss to valuable information regarding the mineral status present on these properties. In addition to this, should economical reserves be present, and the applicant does not have the opportunity to mine, the opportunity to utilize these reserves for future phases will be lost and the limited agricultural activities currently undertaken will continue.

8 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The Public Participation Process (PPP) is a vital component of EIA, it is a regulatory requirement for an environmental authorisation process. It is conducted in terms of Regulations 39 to 44 of the Environmental Impact Assessment (EIA) Regulations GN R.982 (December 2014). PPP is intended to ensure a joint effort of the Interested and affected parties, the stakeholders, technical specialists, the authorities and the proponent/developer who work together to produce better decisions than if they had

acted independently. The Scoping Phase enables the I&AP to raise issues of concern and suggestions for enhanced benefits and not only that, they also ensure that their issues have been considered, assist in identifying reasonable alternatives, comment on the plan of the specialist studies to be undertaken during the impact assessment phase and more importantly the I&APs contribute relevant local information and traditional knowledge to the environmental assessment.

The I&AP should be involved in decision making phase throughout the whole EIA process, they are to be advised on the outcomes or the decision of the authority and also how they can appeal the decision. The I&APs were identified, and the following was undertaken.

- a) Write letters to stakeholders to inform them about the activities that are to take place
- b) Issuing of BID (Background Information Documents) with comments sheets attached for correspondence with stakeholders
- c) Strategic placement of site notices in public areas
- d) A notice, notice board or advertisement referred to in sub regulation (2) must –
Give details of the application which is subject to public participation
State –
 - whether the S&EIR procedures are being applied to the application
 - Whether Scoping procedures are being applied to the application, in the case of an application for environmental authorisation
 - The nature and location of the activity to which the application relates
 - Where further information on the application or activity can be obtained
- e) Advertisement through a local newspaper to make Interested and Affected Parties aware of the activities that are about to take place.
- f) Adjacent farm consultation to alert them about the project that is about to take place in their adjacent properties, should they be issues to be ironed out then they are handled with considerations of impacts on adjacent properties.
- g) Notification of relevant departments of the proposed project
- h) Consultation meetings to address all impacts identified by specialists as well as stakeholders and draw up mitigation measures.

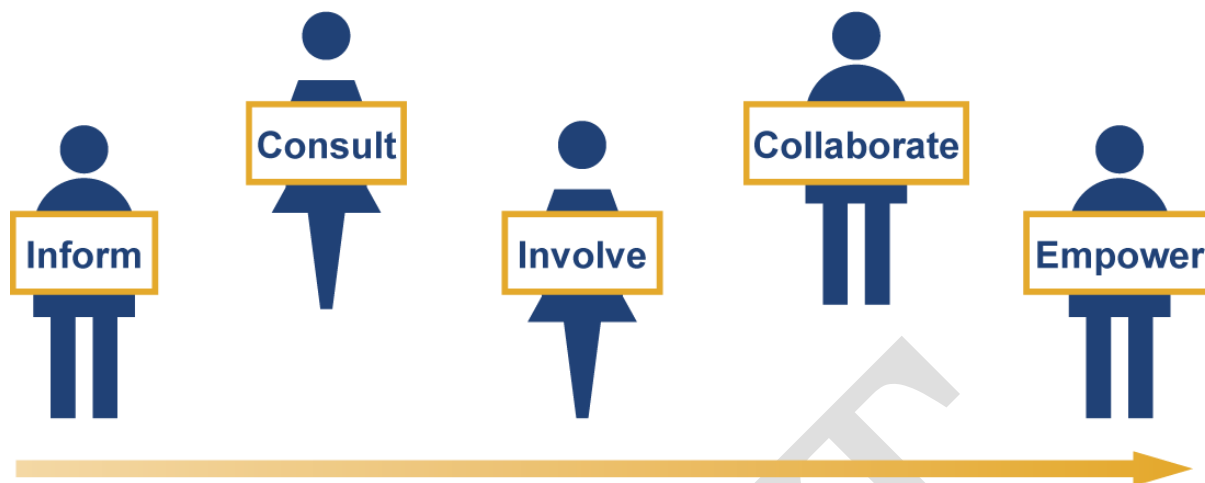


Figure 6: Illustration of engagement in Consultation process.

8.1 I&AP register

Once all the adjacent landowners, organs of state and the public were notified of the activity, an I&AP register was compiled. The list of the I&AP Register indicating the organs of state and other I&APs that have been registered is attached as Appendix C.

8.2 Authorities Consultation

The lead authority for the applications in terms of the MPRDA, NWA, NEMA and NEM: WA is the Department of Mineral Resources (DMR). The Department of Water Affairs and Sanitation (DWS) is the lead authority with regards to the water use license application. The Department of Mineral Resources in North-West (Klerksdrop) as the competent authority will be consulted throughout the application process.

Other local and Regional authorities were identified and included in the I&AP register, and notified of the proposed project by means of the BID.

This Scoping Report was compiled and made available for public and stakeholder review for a period of thirty (30) days. Upon completion of the review period and finalisation of the Scoping Report, this Scoping Report will be submitted to the DMR, where after the DMR will have 43 days to refuse environmental authorisation or accept the Scoping Report and inform the applicant to proceed with the tasks contemplated in the plan of study for the Environmental Impact Assessment (EIA).

The competent authority (the DMR) will then be consulted during the EIA phase of the project, in a similar manner as above. The EIAR and EMPr will be made available for a public and stakeholder review period of thirty (30) days. Upon completion of the review period, the EIAR and EMPr will be finalised and submitted to the DMR, where after the DMR will have a period of 107 days to consider the application and, in writing, notify the applicant of the decision to grant or refuse environmental authorisation.

8.3 Particulars of the public participation process with regard to the impact assessment process that will be conducted

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

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

Measures have already been taken to notify the public of the proposed project during the Scoping Phase. These steps will also be described in detail in the public participation report, as soon as public participation has been undertaken.

Stakeholder engagement varies given the technical nature of the activity, the geographical location, extent, duration, intensity and frequency of potential impacts associated with the proposed activity, as well as the capacity of the receptive community to participate in the project. The processes outlined below are specific to this study.

The I&APs will be identified through several mechanisms these include:

- a) Networking with local farmers, non-governmental agencies, community-based organisations, local council representatives, affected communities and municipality;
- b) Advertising in the local press, placement of community notices, and distribution of Background Information Documents (BID).
- c) All I&AP identified will be registered on the stakeholder database.

8.3.2 Details of the Engagement Process to Be Followed.

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether they attended public meetings and records of such consultation will be required in the EIA at a later stage).

8.3.2.1 Identification of I&APS

The I&APs in this project were identified through networking with local farmers, non-governmental agencies, community-based organisations, local council representatives, affected communities and municipality as well as referral more especially during the site visits and the pre-consultation process. Furthermore, Kimopax conducted a deeds search to identify landowners adjacent to and in the immediate surroundings of the proposed project areas. The English and Setswana newspaper advertisements were published through the Platinum Bushvelder and the Daily Sun which were found to be the most appropriate newspapers in terms of its accessibility to the I&APS.

Notice was also given to Interested and Affected Parties (I&APs) via the placement of notice boards. English written notice boards were placed at different, noticeable and conspicuous places that are visible to the people. The notification letters and emails were sent to the Interested and Affected Parties whose names were identified. Stakeholders will continue to be identified and captured in a stakeholder database throughout the process.

The BID was developed for the proposed project providing background information pertaining to the project and intending to inform I&APs of the project. The BID also included a registration form that I&APs, stakeholders and organs of state were encouraged to complete in order to register as an I&AP for the project. All I&APs and stakeholders are invited to peruse the Scoping Report and provide comment within thirty (30) days. Details of where comments should be directed was also provided.

Pre- Consultation meetings were conducted with the communities. Sefikile community was administered at Sefikile tribal office on the 10th October 2018 at 10:00am. The Mononono community meeting was addressed the same day as former at TBC at 13:00pm. Manamakgotheng community were addressed at Lekgotla on the 11th October 2018 at 10:00 am and the Legogolwe community meeting was conducted the similar date and venue, however the time was 13:00pm.

The I&APs and stakeholders will further be notified during the process of the availability of the EIAR and EMP for public and stakeholder review by means of notifications (via e-mail and post). All comments received on the EIAR and EMP will be incorporated and responded to in the final EIAR and EMP to be submitted to the DMR.

8.3.2.2 Description of the information to be provided to interested and affected parties.

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

Notification letters, including a Background Information Document (BID) have been provided to I&APs and stakeholders during the Scoping Phase. The I&APs and stakeholders will further be notified during the process of the availability of the EIAR and EMP for public and stakeholder review by means of notifications (via e-mail and post). Most importantly all comments received on the EIAR and EMP will be incorporated and responded to in the final EIAR and EMP to be submitted to the DMR.

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

The proposed Vanadium, Titanium and Iron Ore mining and related infrastructure project will include several activities which require a Scoping and EIA/EMP.

The EIA/EMP process followed for the proposed mining development is tailored to cater for both the National Environmental Management Act (NEMA) (Act 107 of 1998) as amended; Mineral and Petroleum Resources Development Act (MPRDA) (Act 28 of 2002) and EIA Regulations 2014. The authorisation process will include the following:

Scoping Phase:

- a) Stakeholder identification and notification process
- b) State and Non-state Authority Consultation
- c) Registration of issues raised by Interested and Affected Parties (Database registration)
- d) Impacts identification and assessment
- e) Specialist study identification
- f) Compiling the Scoping report (Draft and Final)
- g) Distribution of reports to stakeholders for review and informative purposes
- h) Submissions of Reports to competent authorities for approval.

Impact Assessment Phase:

- a) Completion of specialist
- b) Environmental Impact Assessment
- c) Environmental Management Plan.
- d) EIA Report development
- e) Distribution of Reports to stakeholders for review

Submission of Final reports to Competent Departments for decision making purposes.

Lead Authority's decision

As soon as the DMR has taken a decision about the proposed project, Kimopax will immediately notify I&APs of this decision and also given the opportunity to appeal. The registered I&AP will be provided with a letter summarising the competent authority's decision and where ever they disagree to the decision of the authority they can lodge an appeal. Moreover, the Authorities decision will be published through Platinum Bushveld and Daily Sun newspaper advertisement.

Conclusions of the PPP

The Public Participation exercise has provided adequate information to enable an understanding of what the Matai Mining Right entails and to address the concerns and comments received during the process.

8.5 Summary of Issues Raised by I&APS

All comments and responses received during the announcement and scoping public review period have been captured in the Appendix A (Public Participation Process).

The main categories of comments raised during the Scoping Phase including the pre-consultation meeting with the Manamakgotheng, Mononono, Legogolwe, Lesobeng, Sefikile and Cattle post communities had reference to the following:

- a) The appointment of specialist in particular the ventilation specialist (Air Quality),
- b) What measures are in place to deal with the impacts of the mine, more especially air pollution and blasting when the mine is in operation,
- c) The issue that the Social and Local Plan (SLP) should be done separately,

d) Employment opportunities associated with the proposed mining project

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9 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

9.1 Socio-Economic Environment

(Type of Environment Affected by the Proposed Activity its current geographical, physical, biological, socio-economic, and cultural character).

9.1.1 Socio-Economic Profile

This section describes the socio-economic characteristics of the potentially affected area in order to develop an understanding of the broad social and economic conditions of the environment. The proposed project has the potential to result in both positive and negative socio-economic impacts. As such, it is important that the socio-economic baseline conditions are understood to ensure accurate identification and assessment of potential impacts associated with the proposed project.

The data used in this socio-economic analysis was obtained from the MKLM 2017/2018, BPDM 2017/2022 IDP, Statistics South Africa, 2011, Community Survey, 2016 and BBKTA Masterplan

9.1.1.1 Traditional Authorities

Traditional authorities refer to mainly rural areas whereby chiefs and their councils are responsible for administrative tasks at a community level and in mobilising local communities if there are any investment Projects within their area of jurisdiction. The Matai Mining proposed project is located within a traditional area, namely Bakgatla-Ba- Kgafela Traditional Authority (BBKTA), however, there are other traditional authority/ies in close proximity to the proposed project area namely Bathalerwa and Baphalane Traditional Authorities which share immediate borders with the BBKTA jurisdiction and Mmatsere Traditional Authority (MTA) and Bakubung Ba Ratheo (BBR) (Development, 2014).

The BBKTA community consist of 32 villages and is located in the North West province along the Western Bushveld Complex, the world's largest known platinum reef, and as such is greatly influenced by the platinum mining industry. The area is also impacted by the demographic and economic realities of neighbouring communities. This includes urban areas in Gauteng, provincial developments in the North West and Limpopo, market activity in southern Botswana, and interactions with other traditional authorities

9.1.1.2 Villages Affected

Communities that are affected by the proposed project are Manamakgotheng, Mononono, Legogolwe, Lesobeng, Sefikile and Cattle post.

9.1.2 Demographic Profile

9.1.2.1 Population and Growth Trends

According to StatsSA (Census 2011), NWP has a population of approximately 242 554. According to the 2011 Census, Moses Kotane Local Municipality has a total population of 242 554 people, of which 98,3% are black African, 0,8% are white, with the other population groups making up the remaining 0,9 %. Of those aged 20 years and older, 9,3% have no schooling, 17,1% have some primary school education, 35,3% have some secondary education, 27,4% have completed matric, and 5,3% have some form of higher education. An average household size of 3.2.

NWP has a population of approximately 3,5 million residents, with an average household size of 3.2 and growth rate of 1,6%. The BPDM population constitutes 42% of the provincial population with an average household size of 2.9 and 2,2% growth rate. MKLM population constitutes approximately 16% of the District Municipality population with an average household size of 3.2 (same as the province) and 0,2% growth rate (Census, 2011).

The population of NWP, BPDM and MKLM is also young with an average of 58% being under 35 years of age (Census 2011). There are also more men in the Province (50,7%) and in BPDM (57,8%). Contrary to the Province and District municipality, there are marginally more females in MKLM (50,2%). Black Africans comprise the majority population group in the Province (90%) followed by Whites (7,3%), Coloureds (2%), and Indian/Asians (0,6%). A similar pattern is also observed at the municipal levels. The majority of the population in NWP, BPDM and MKLM (64,7%, 68% and 63%, respectively) is within the working age group. Dependency ratios in NWP, BPDM and MKLM are estimated at 54,5%, 47,3% and 58,6% respectively (StatsSA (Census, 2011). Table 5 below present statistical information for the wards located within the Project area.

Table 5: Moses Kotane Local Municipality Wards 7, 8 and 22 Population Information

Aspect	Ward 7	Ward 8	Ward 22
Population	4 227	1 999	10 842
Males	55%	52.1%	50.2%
Females	45.1%	47.9%	49.8%
Black Africans	99.5%	99%	99.6%
Whites	0.0%	0.4%	0.1%
Other Races	1%	0.6%	1%

Source: Stats SA (Census, 2011)

The Bakgatla Ba Kgafela tribe consists of approximately 350 000 people. The total number of people living in the BBKTA jurisdiction in 2012 was estimated to be 117 000. This is approximately 35% of the total population in the MKLM. Therefore, it is assumed that only one-third of the Bakgatla Ba Kgafela tribe reside permanently in the BBKTA jurisdiction. This low level of residency is attributed to local joblessness which forces many community members to leave the area in search of employment (Development, 2014).

9.1.2.2 Household Size and Composition

The socio-economic survey conducted by BBKTA reveals that each household in the BBKTA jurisdiction accommodates an average of 4.2 people. Approximately 54.5% of residents are female. This high female to male ratio is attributed to the limited economic opportunities in the region which force many men to leave in search of employment as well as the higher life expectancy among women. As a result, the majority of households in the jurisdiction are headed by females. This results in socioeconomic consequences including lower incomes, a greater number of dependants and, as a result, higher levels of poverty (Development, 2014).

9.1.2.3 Employment and Income

The unemployment rate in the BBKTA is approximately 49% which is higher than the 37,9% unemployment rate for the MKLM. The mining sector is the largest employer of Bakgatla community members. Approximately 48% of employed Bakgatla residents work in the mines. The second largest employer is the retail sector accounting for approximately 12% of the local workforce, and 8%, 6%, 5%, 4% and 2% in social services, domestic work, government, manufacturing, construction and tourism respectively. Approximately 77% of residents earn less than R 3 000 per month with 39% of residents in the R 750 to R 1 500 bracket (Development, 2014).

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9.2 Biophysical Environment

The Information in this section has been obtained from the South African weather Services (SAWS) and previous studies that were undertaken within the Moses Kotane Local Municipality .

9.2.1 Climate

9.2.1.1 Regional Climate

The project area falls within the Highveld Climatic Zone. The summer months are from August to March. The majority of the rainfall is during the summer months of October to March at which time approximately 85 % of the annual rainfall occurs. Summer temperatures range between 22 and 34° C and winter brings with it dry, sunny days and chilly nights. The average winter (from May to July) temperature is 16° C but can range from an average of 2 to 20° C in a single day. Temperatures in this climatic zone are generally mild, but lower temperatures can be experienced in winter. Frost characteristically occurs in the winter months. Generally, winds are light, but south-westerly winds associated with thunderstorms are typically strong and gusty. The length of the day varies significantly over the course of the year. The shortest day is in June; whilst the longest day is in December (Stolp, 2017).

9.2.1.2 Temperature

The monthly maximum and average temperature for the project area is presented graphically in Figure below. The maximum temperatures were observed from December to January recording the highest temperature of 35 °C, followed by October to November and February (33°C). The monthly averages ranged from 11°C between June and July to 25°C from December - February. The annual average temperature for the project site is 19°C (Stolp, 2017) .

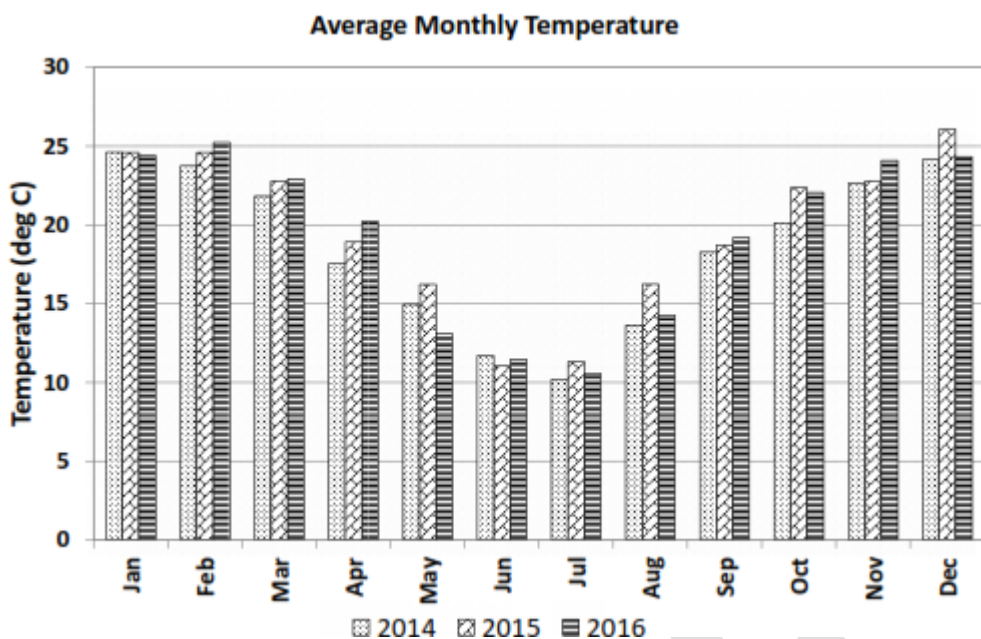


Figure 7: Average Monthly Temperature (Stolp, 2017)

9.2.1.3 Rainfall

The highest rainfall of 281 mm was observed in December. The lowest recorded rainfalls (5 mm) were observed during May and August. The annual total and average rainfall reached 1068 mm and 682 mm respectively (Stolp, 2017).

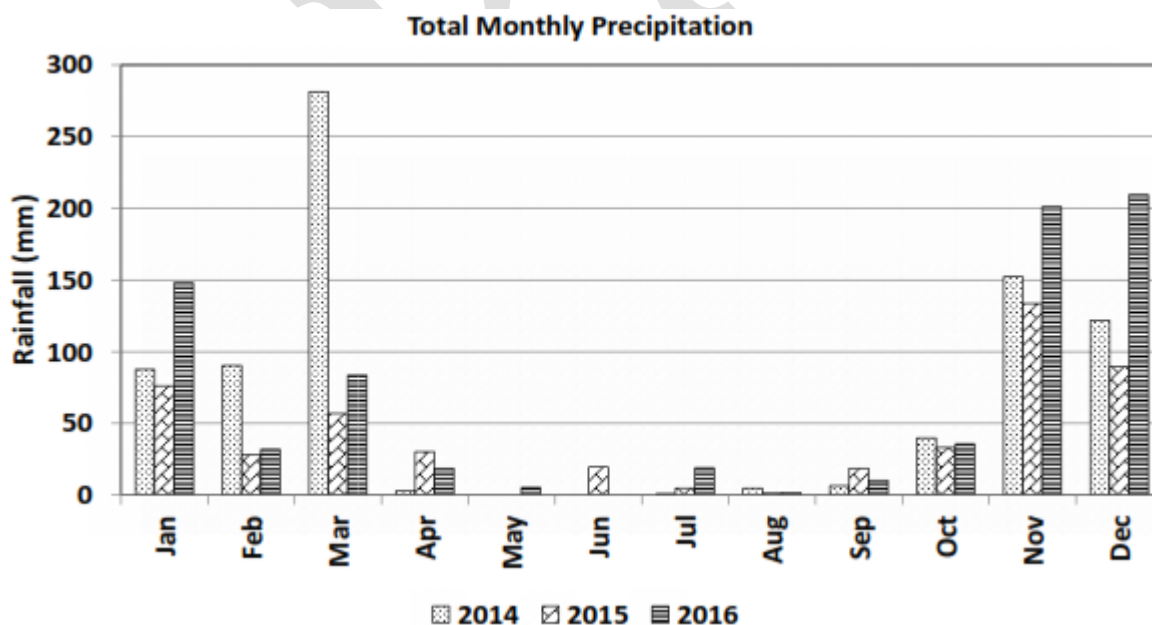


Figure 8: Total Monthly Precipitation

9.2.1.4 Wind Speed

One of the factors that favour the suspension and resuspension of loose particulates in the atmosphere is the intensity of the wind speed regime. Wind speed greater than 5.4 m/s leads to erosion of loose dust PM and the degree of dispersion across the landscape. Figure below shows that wind speed greater than 5.4 m/s occur every month with increases observed from the months of January, August and October (10m/s). Although average wind speed is generally below 5.4 m/s (Stolp, 2017).

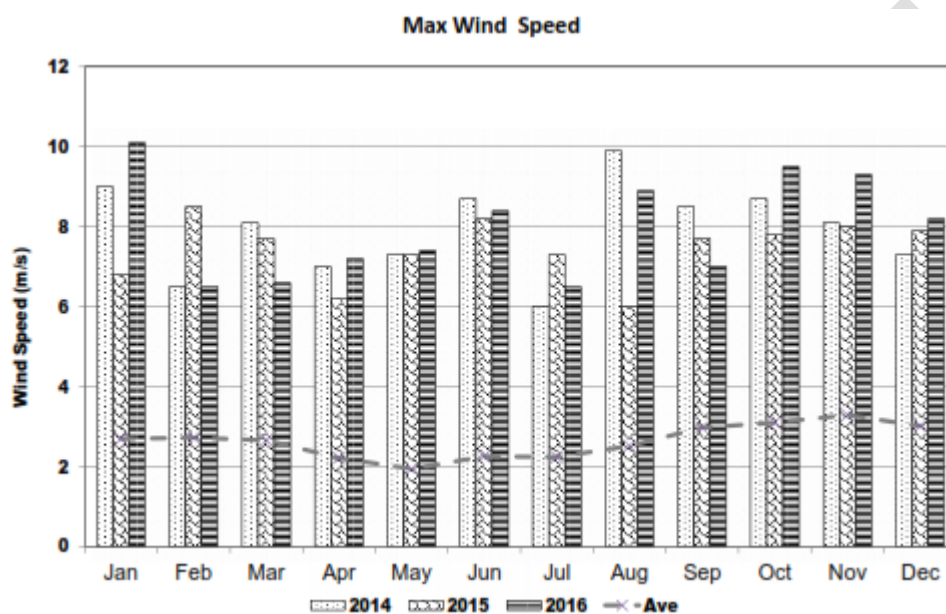


Figure 9: Monthly Maximum Wind Speed

9.2.2 Air Quality

It is worth noting that environmental dust is an inherent property of the natural environment, even without anthropogenic influences such as the proposed mining and transport activities. The baseline air quality status quo based on levels of pollutants within the study area will be assessed using South African Air Quality Information System (SAAQIS) An Air quality specialist will conduct a site inspection.

9.2.3 Noise

Noise is part of our daily exposure to different sources which is part of daily living and some of these physical attributes which may at times be intrusive forms part of the ambient levels that people get used to without noticing the higher levels. A Noise and Blasting specialist will conduct a site inspection. The results are still to be included in the EIA Report accordingly.

9.2.4 Geology

9.2.4.1 Regional Geology

According to available geological maps the proposed Matai project is located on the Bushveld Igneous Complex (BIC) that is estimated to have developed approximately 2,060 million years ago. The mafic rock sequence of the BIC, the Rustenburg Layered Suite (RLS), is the world's largest known mafic igneous layered intrusion containing approximately 90% of the world's known platinum group metals (PGMs) reserves. In addition to the PGM's, extensive deposits of iron, tin, chromium, titanium, vanadium, copper, nickel and cobalt also occur.

The Bushveld Complex extends approximately 450 km east to west and approximately 250 km north to south. It underlies an area of some 65 000 km², spanning parts of the Limpopo, North West, Gauteng and Mpumalanga Provinces. The Bushveld Complex consists of four distinct igneous suites, namely, in age order, early mafic sills, the Rooiberg Group felsites, multiple mafic and ultramafic layers of the Rustenburg Layered Series which host platinum group element mineralisation and the latest Lebowa Granite Suite which cross-cuts the 110 km thick Rustenburg Series. Covering of the Bushveld by younger sediments and intrusion of later magmas means that the outcrop of the Rustenburg Layered Series is limited to two basin-like lobes to the west and east and a linear lobe to the north.

9.2.4.2 Local Geology

The study area is underlain by the Bierkraal Magnetite Gabbro (BMG) from the Rustenburg Layered Suite of the Bushveld Complex (geological map 2526 Rustenburg 1:250 000). The Bierkraal Magnetite Gabbro (BMG) is classified as a ferrogabbroic Upper Zone according to the Standard zonal subdivision (Johnson & Thomas, 2006). The BMG of the Rustenburg Layered Suite consists of magnetite gabbro, diorite and a magnetite layer. The surface layer is shown in Figure 10: Geological map of the area

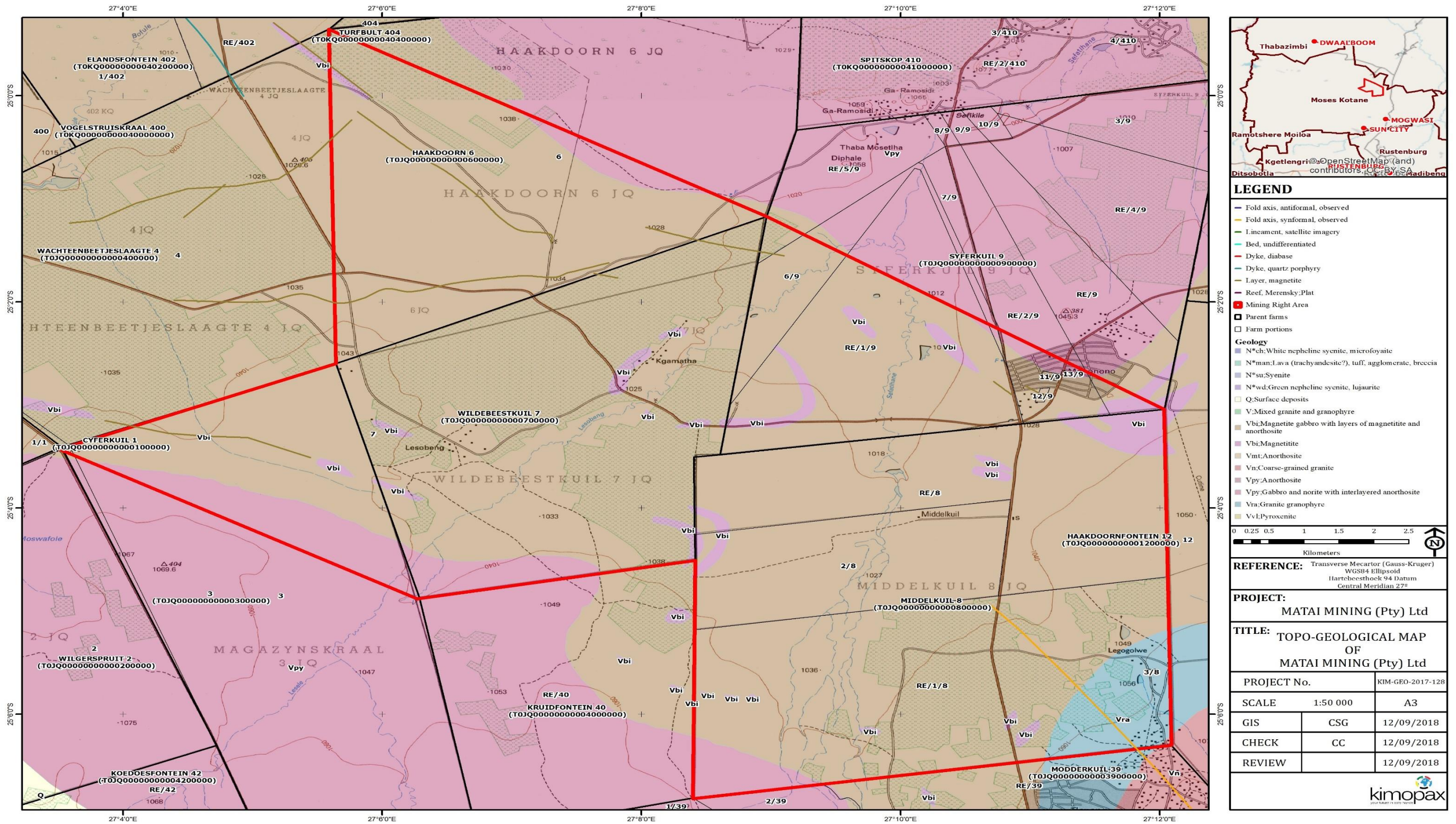


Figure 10: Geological map of the area

9.2.5 Geohydrological Setting

The 1:500 000 Geohydrological Map of Johannesburg (2526), developed by the Department of Water and Sanitation (DWS), characterise the underlying aquifers present on site as “Inter-granular” and “Fractured Type” aquifer, see Figure 11 below.

The Matai area is classified as having a moderate potential for groundwater occurrence with typical borehole yields between 0.5 and 2.0 L/s being reported. Higher yielding boreholes are usually related to regional linear geological features like lineaments, fractures or faults.

9.2.5.1 Hydrological Setting

The project site falls within quaternary catchment No. A24E which forms part of the catchment of the Crocodile River which ultimately feeds into the Limpopo. Figure 12 shows surface water drainage system around Matai area. Watercourses over the site are likewise classified as non-perennials flowing only during the wet season or after rainfall events. The 1:50,000 topographic map for the site indicates the presence of a few small dams, while the National Freshwater Ecosystems Priority Areas (NFEPA) map illustrates the presence of fringe wetland areas associated with the dams on the site.

One primary non-perennial rivers drain the site, namely; the Phufane River to the east (Refer to Figure 12). The larger Phufane River is associated with a number of tributaries adding to the total catchment area drained by this river. Both of the aforementioned rivers intersect the site before they join the Sefathlane River, which in turn drains into the Brakspruit River. The Brakspruit River is the primary river associated with quaternary catchment A24E into which the site falls. Quaternary catchment A24E has its headwaters in the Pilanesberg situated to the south of the site.

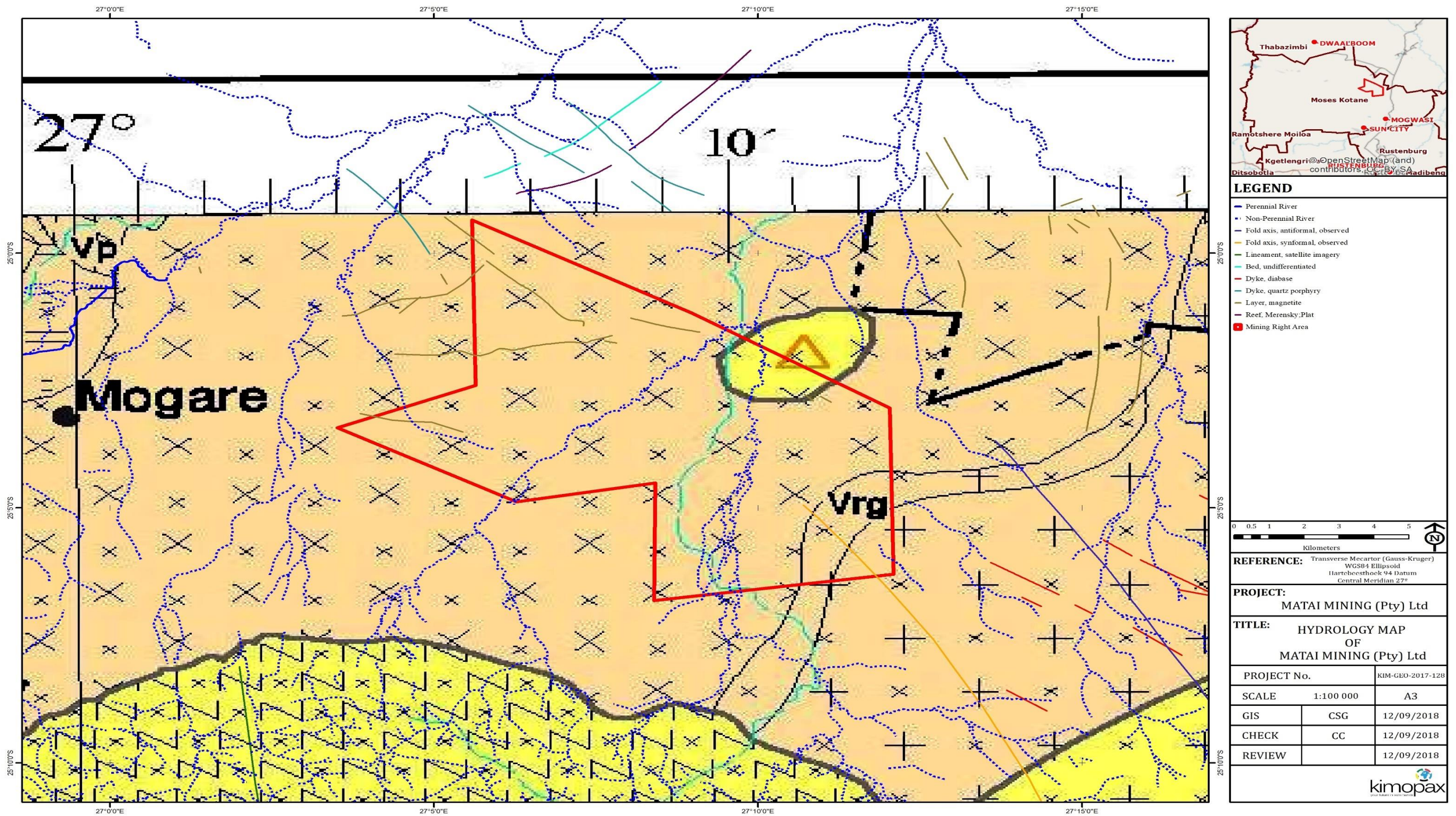


Figure 11: Geohydrological map

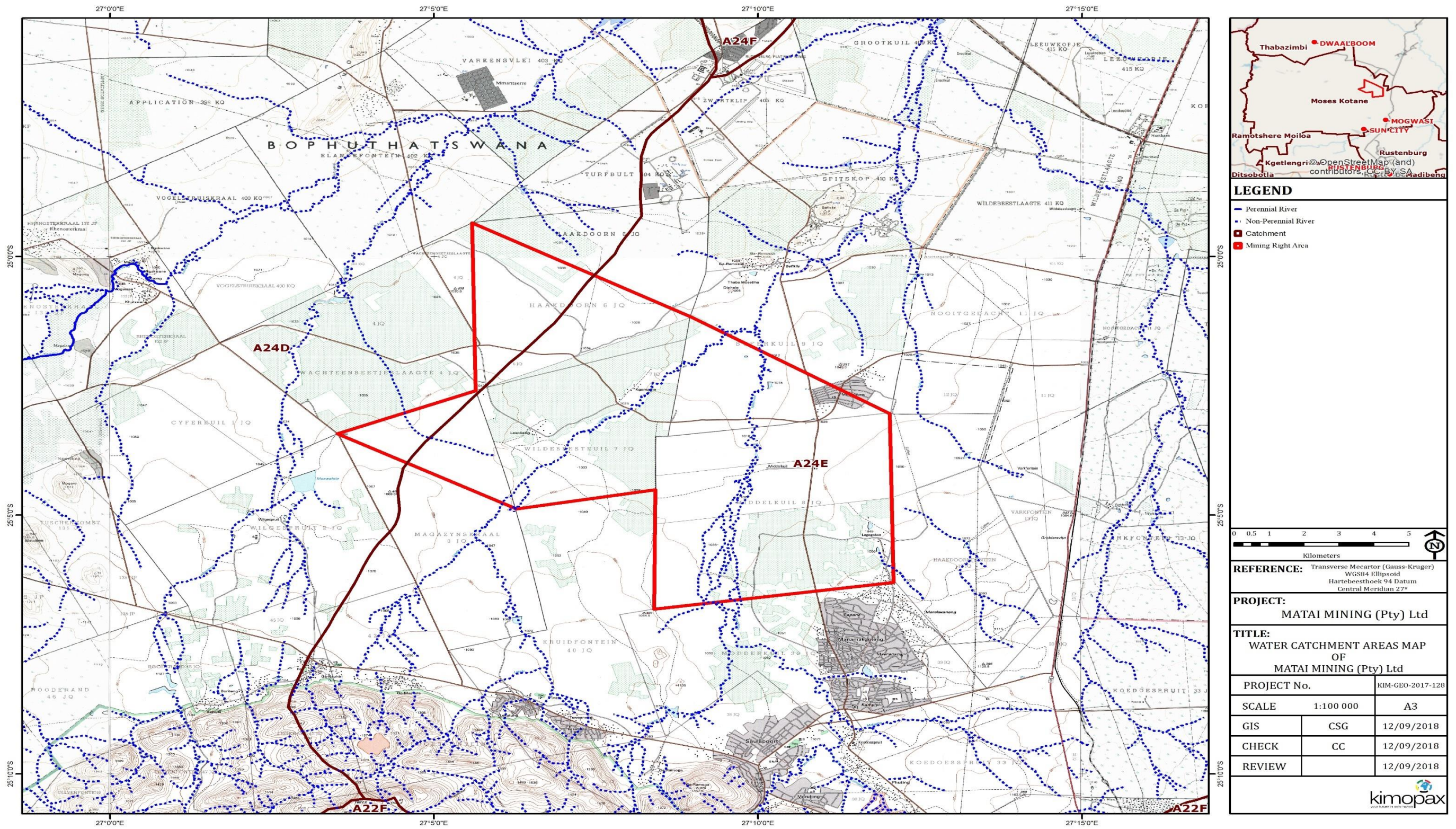


Figure 12: Drainage map

9.2.5.2 Potential Water Impacts

Water is an essential requirement in the mines and the water uses include water for plant operation, controlling dust, and meeting the needs of workers on site. However, the use of water in mining has the potential to affect the quality of surrounding surface water and groundwater. The project area is predominantly occupied with farms that are cultivated; contamination of water in the surrounding streams could have impacts on the downstream water users and the aquatic life as well.

The infrastructure and associated activities include, but is not limited to administration offices, change houses (including ablution facilities), workshops, access to the underground workings, ventilation shafts, infrastructure to service the mining area. Furthermore, waste discard dumps will need to be developed for the storage of waste rock from mining activities and slurry from beneficiation activities.

These activities have the potential to impact negatively/positively on surface water quality and quantity.

9.2.6 Topography

The project site is relatively flat, at an average elevation of 1040 metres above mean sea level (mamsl), with various non-perennial drainage lines crossing the site. The topographic relief can be described as relatively gently sloping towards the north-east, while the topographic elevation varies between 1075mamsl in the north east of the project site to 1015mamsl in the north. To the south of the project site is the Pilanesberg Mountain Range and the associated hills that vary between 1 330 and 1 534mamsl.

9.2.7 Soils

Soils are a significant component of most ecosystems. As an ecological driver, soil is the medium in which most vegetation grows and a range of vertebrates and invertebrates exist. In the context of mining operations, soil is even more significant if one considers that mining is a temporary land use where-after rehabilitation (using soil) is the key to re-establishing post closure land capability that will support post closure land uses. The concentrations of natural salts and stores of nutrients within soils are a sensitive balance due to the extremes of rainfall, wind and temperature. The ability of a soil to retain moisture and nutrients and in turn influence the sustainability of vegetative growth and dependence of animal life is determined by the consistency and degree of soil moisture retention within the profile but out of the influence of evaporation. These conditions and the sensitivity of these variables must be noted and their importance to the overall bio-diversity balance understood if the sustainability equation is to be managed and mitigated.

Mining projects have the potential to damage the soil resource through physical loss of soil and/or the contamination of soils, thereby impacting on the soils ability to sustain natural vegetation and altering land capability. Contamination of soils may in turn contribute to the contamination of surface and groundwater resources. Loss of the topsoil resource reduces chances of successful rehabilitation and restoration. To understand the basis of these potential impacts, a soil and land capability study will be conducted during the assessment phase. As illustrated in Figure 13: Soils M; the majority of the mining right area is covered red-yellow apedal, freely drained red soils.

9.2.8 Heritage and Paleontology

Site clearance, deposition of overburden, waste and earth moving activities to allow for the construction of mine infrastructure and the development of the mine could impact on potential heritage and paleontological resources. The severity of potential impacts on paleontological resources is expected to be moderate/high and permanent, with little mitigation possible. With regard to heritage resources on surface, most of the heritage sites have low or moderate significance. The Archaeologist will consider the presence of heritage resources in developing the site layout.

9.2.9 Visual Baseline

Mining-related activities have the potential to alter the landscape character of the site and surrounding area through the establishment of both temporary (such as pits, mineral processing infrastructure and support facilities) and permanent infrastructure (such as the tailings storage facility and waste rock dumps). As a baseline, this section provides an understanding of the visual aspects of the area against which to measure potential change as a result of mine infrastructure and activities.

In describing the visual landscape, a number of factors will be considered, including landscape character, sense of place, scenic quality, and sensitive views. It is important to note that the study area defined for the visual study is a 15km radius around the study area as beyond this distance, the project components would be 'absorbed' into the landscape setting.

9.2.9.1 Landscape Character

The landscape character of the study area is defined by relatively flat plains, punctuated by isolated hills in the west and the dominant hills associated with the Pilanesberg National Park (PNP) in the south.

While the plains have been disturbed by anthropogenic activities, the hills are relatively 'untouched' with a dense vegetation cover of bushveld species associated with the Dwaalboom vegetation type. Current land uses in and adjacent to the study area is a combination of grazing, crops, mining, residential and

general community activities.

9.2.9.2 Visual Receptors

Public views (sensitive viewing areas) to the mine could be experienced by people living and visiting the adjacent communities, employees travelling to work, as well as tourists visiting the attractions in the area or travelling through the area to other destinations.

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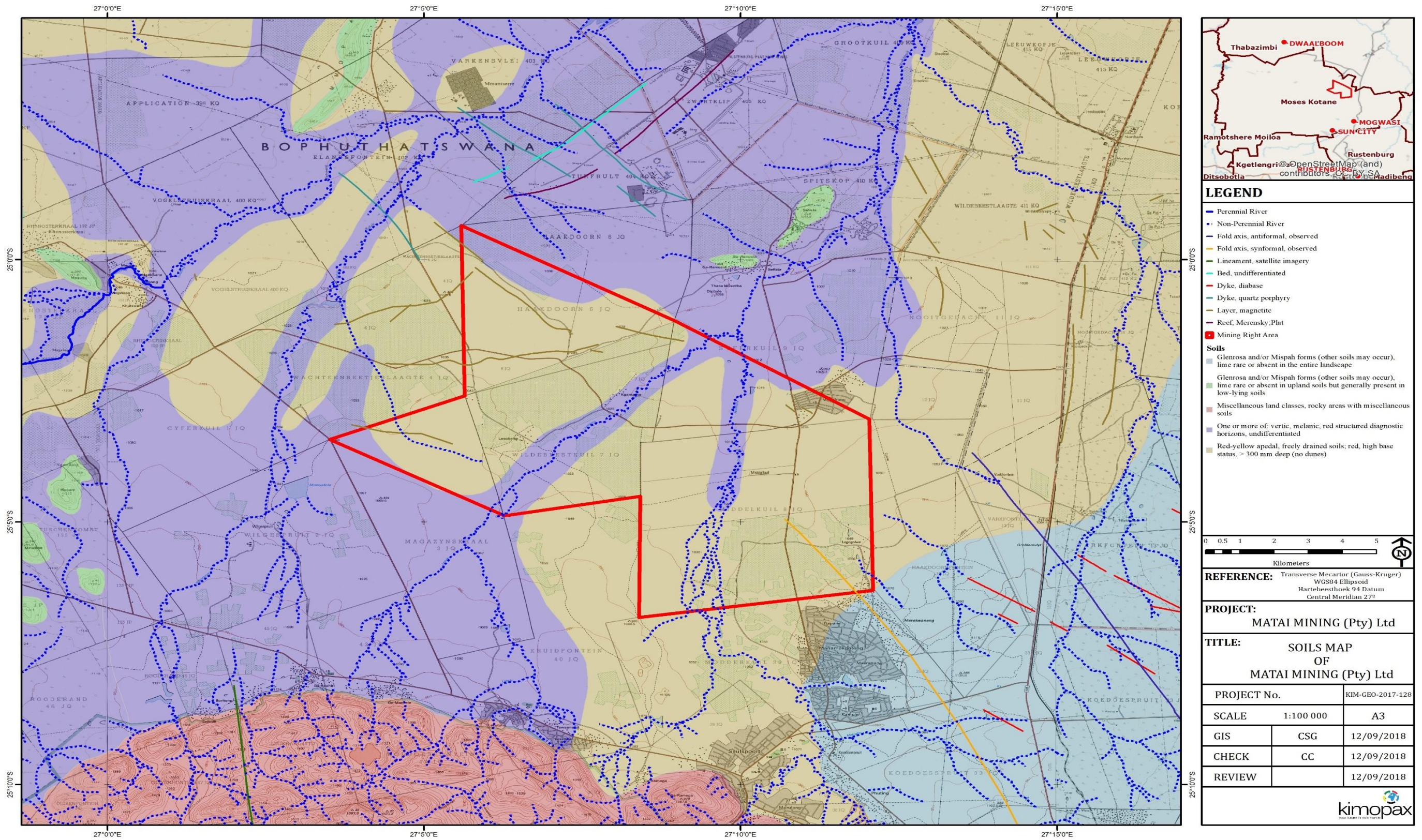


Figure 13: Soils Map

9.2.10 Vegetation

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

- a) Soil formation and fertility maintenance;
- b) Primary production through photosynthesis, as the supportive foundation for all life;
- c) Provision of food and fuel;
- d) Provision of shelter and building materials;
- e) Regulation of water flows and water quality;
- f) Regulation and purification of atmospheric gases;
- g) Moderation of climate and weather;
- h) Control of pests and diseases; and
- i) Maintenance of genetic resources.

The establishment of mining-related infrastructure and support facilities have the potential to result in the loss of vegetation, habitat and related ecosystem functionality through physical disturbance and/or contamination of soil and/or water resources.

As a baseline, this section provides an outline of the type of vegetation occurring in the study area and the status of the vegetation, highlights the occurrence of sensitive ecological environments including sensitive/ endangered species (if present) that require protection and/or additional mitigation should they be disturbed.

The region, in which the study area is located, is typical of the Dwaalboom Thornveld, which is a component of the Savanna Biome as illustrated in Figure 14: Biomes map. The Savanna Biome covers a large area and is subdivided into various components, with the Dwaalboom Thornveld comprising a part of the Central Bushveld Bioregion. The features of this vegetation type include plains with layers of scattered, low to medium high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by grass species. The conservation status of this vegetation type is considered Least Threatened and the nationally set conservation target is 19%, with 6% statutorily conserved, mostly in the Madikwa Nature Reserve and Pilanesberg Nature Reserve.

This vegetation is typified by an open canopy of *A. tortilis* (Umbrella Thorn); *Acacia* species and an abundance of *Dichrostachys cinerea* (Sickle Bush). The understory consisted mainly of grasses: *Aristida*

bipartita (Rolling Grass); *Bothriochloa insculpta* (Pinhole Grass); *E. rigidior* (Broad Curly Leaf) and *Panicum maximum* (Guinea Grass) as well as dominant forbs *Asparagus larycinus* (Cluster-leaf asparagus); *Hibiscus trionum* (Bladder Hibiscus); *Nidorella anomala* (Mulder, July 2015).

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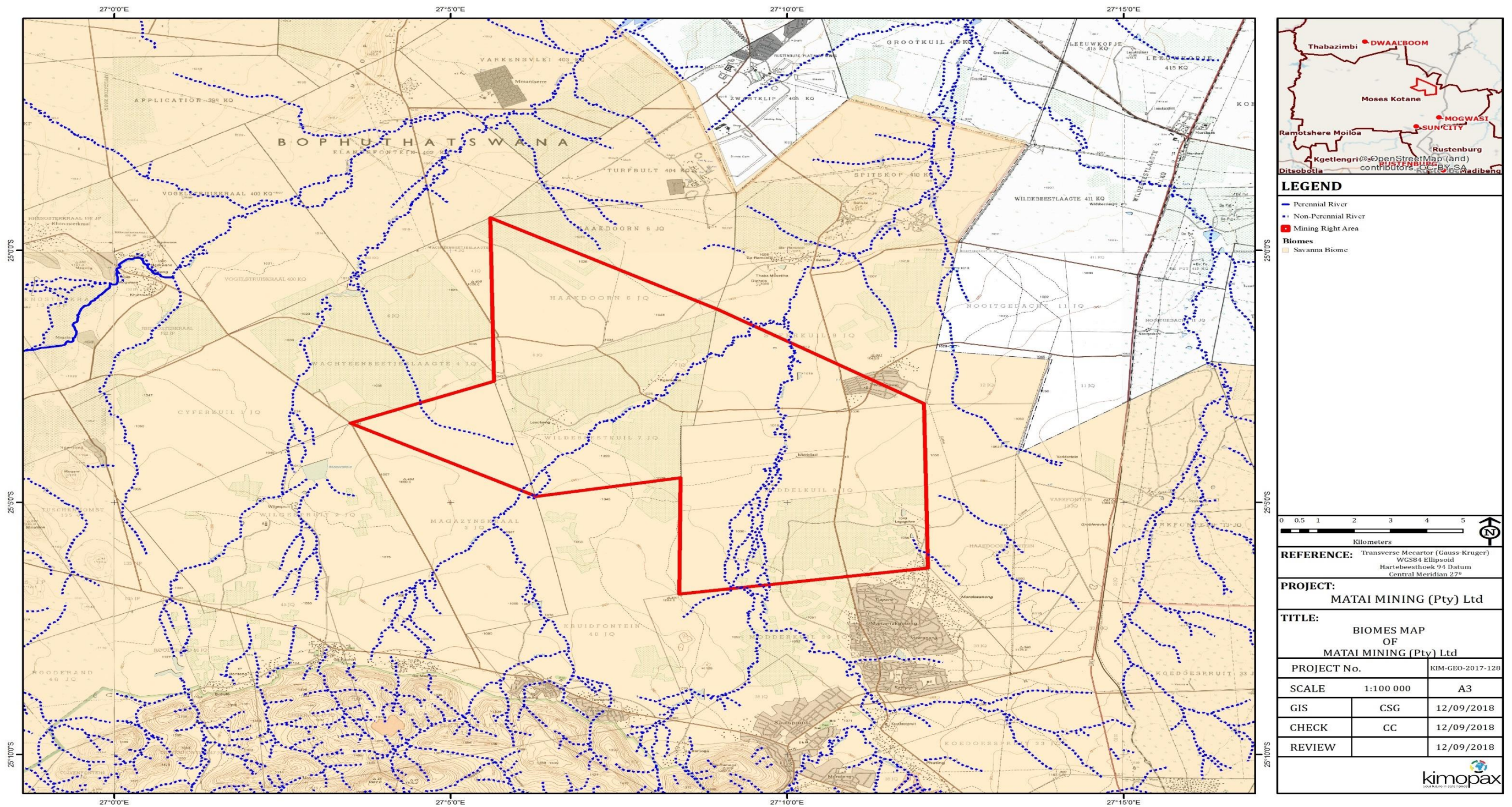


Figure 14: Biomes map

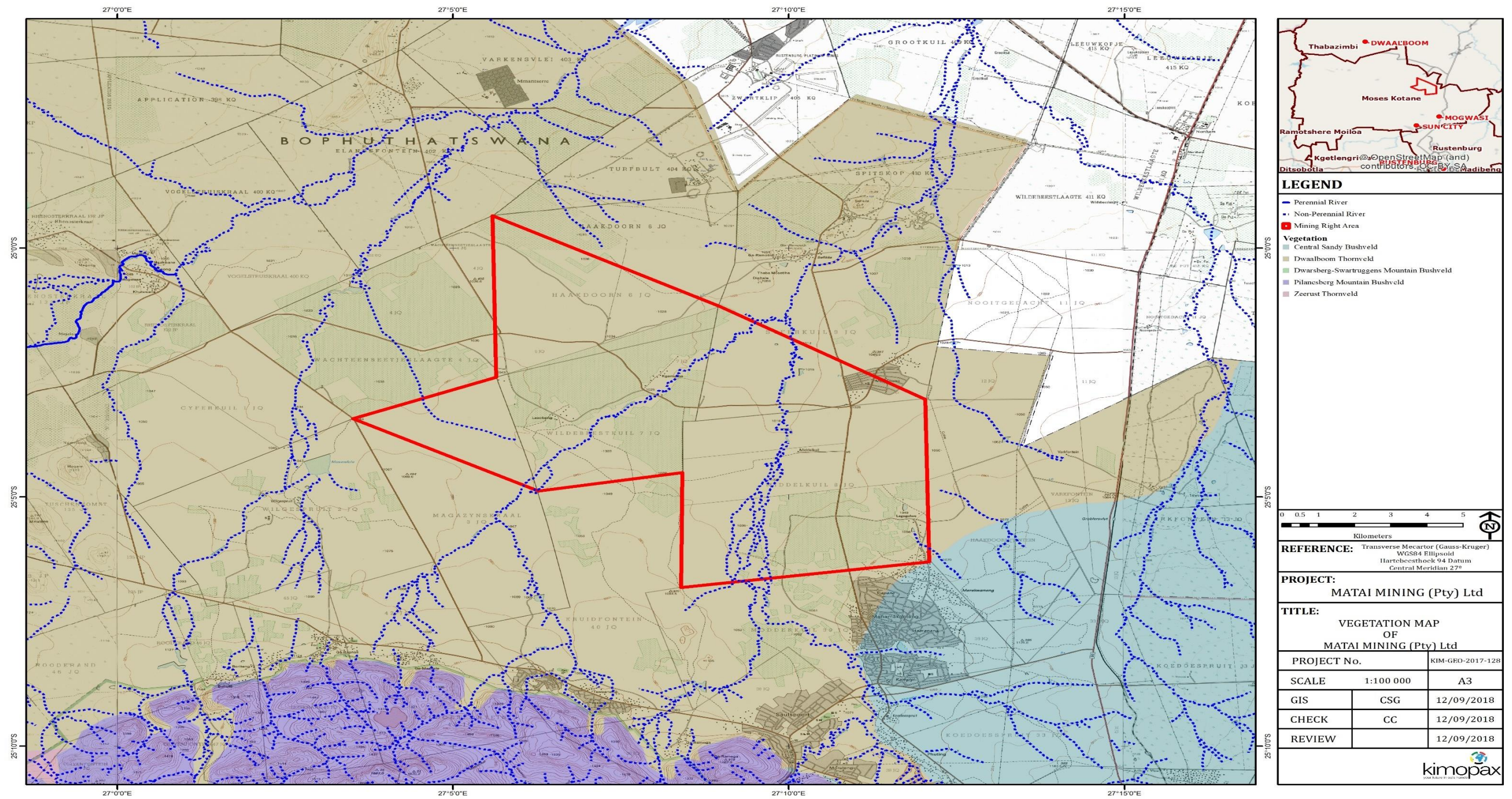


Figure 15: Vegetation Map

9.2.11 Faunal Assessment

Domestic cattle, donkeys, sheep, goats, pigs, dogs, cats and poultry were common in the study area. Grazing and trampling by livestock have had an obvious adverse impact on vegetation, while predation by dogs and cats is likely to have had a negative impact on certain fauna (e.g., large terrestrial birds and reptiles). Hybridization and disease transmission may also present a problem between domestic animals and wildlife.

9.2.11.1 Birds

Alien birds including the Common Myna (*Acridotheres tristis*), House Sparrow (*Passer domesticus*) and Rock Dove (*Columba livia*) have the potential of existing in the study area but are expected to have a limited impact on biodiversity due to their current low abundance. Due to its proximity to Pilanesberg Nature Reserve there could be a possibility of the existence of the following bird species:

- a) Secretary bird (*Sagittarius serpentarius*) which is a near threatened species based on the South African Red Data Species
- b) Kori Bustard (*Ardeotis kori*) which is a vulnerable species based on the South African Red Data Species
- c) Tawny Eagle (*Aquila rapax*) which is a vulnerable species based on the South African Red Data Species
- d) Martial Eagle (*Polemaetus bellicosus*) which is a vulnerable species based on the South African Red Data Species

9.2.11.2 Terrestrial Macro-invertebrates

Except for butterflies, comprehensive data of the IUCN status of any particular order of invertebrate is limited. However, the NEMBA Schedule of 2007 lists a number of South African invertebrate taxa as protected. Potentially occurring invertebrates which may occur within the study area include the following:

- a) Tiger Beetles (*Dromica* spp.): protected species
- b) Stag Beetles (*Oonotus* spp.): protected species
- c) Burrowing Scorpion (*Opisththalmus glabifrons*): protected species
- d) Common Baboon Spiders (*Harpactira* spp.): protected species

10 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE

10.1 Infrastructure

There is an existing powerline and water pipeline that traverse the site as illustrated in Figure 16 site below

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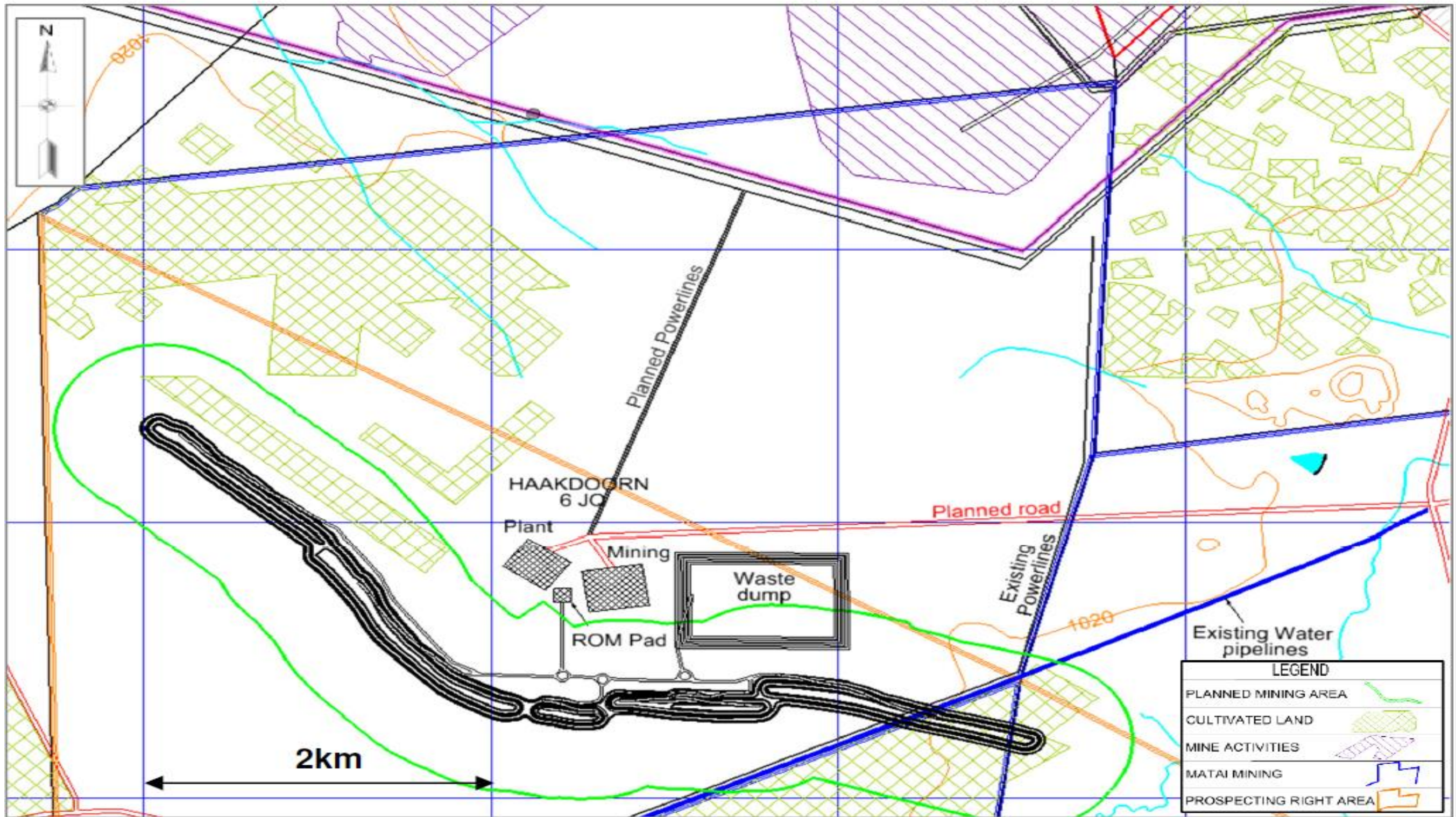


Figure 16: Proposed and existing infrastructure on site

10.2 Description of the Current Land Uses

The proposed mining site is an agricultural area and is characterized by mining, farming and grazing activities, generally the land use is open veld and wilderness.



Picture 1: Property used for grazing

The properties have also been used for subsistence crop farming as illustrated in Picture 4 below:



Picture 2: Evidence of cultivation

Although there is evidence of past agricultural use, the current land use is largely natural veld interspersed with some exotic plant species. Woodlands is identified on the farm in the higher altitude areas. Several access routes are spotted around the area.

11 ENVIRONMENTAL AND CURRENT LAND USE MAP.

(Show all environmental and current land use features)

The proposed mining site is an agricultural area and is characterized by mining, farming and grazing activities, generally the land use is open veld and wilderness. Although there is evidence of past agricultural use, the current land use is largely natural veld interspersed with some exotic plant species. Woodlands is identified on the farm in the higher altitude areas. Several access routes are spotted around the area. The Land use map is illustrated in Figure 17: Land-use and vegetation map

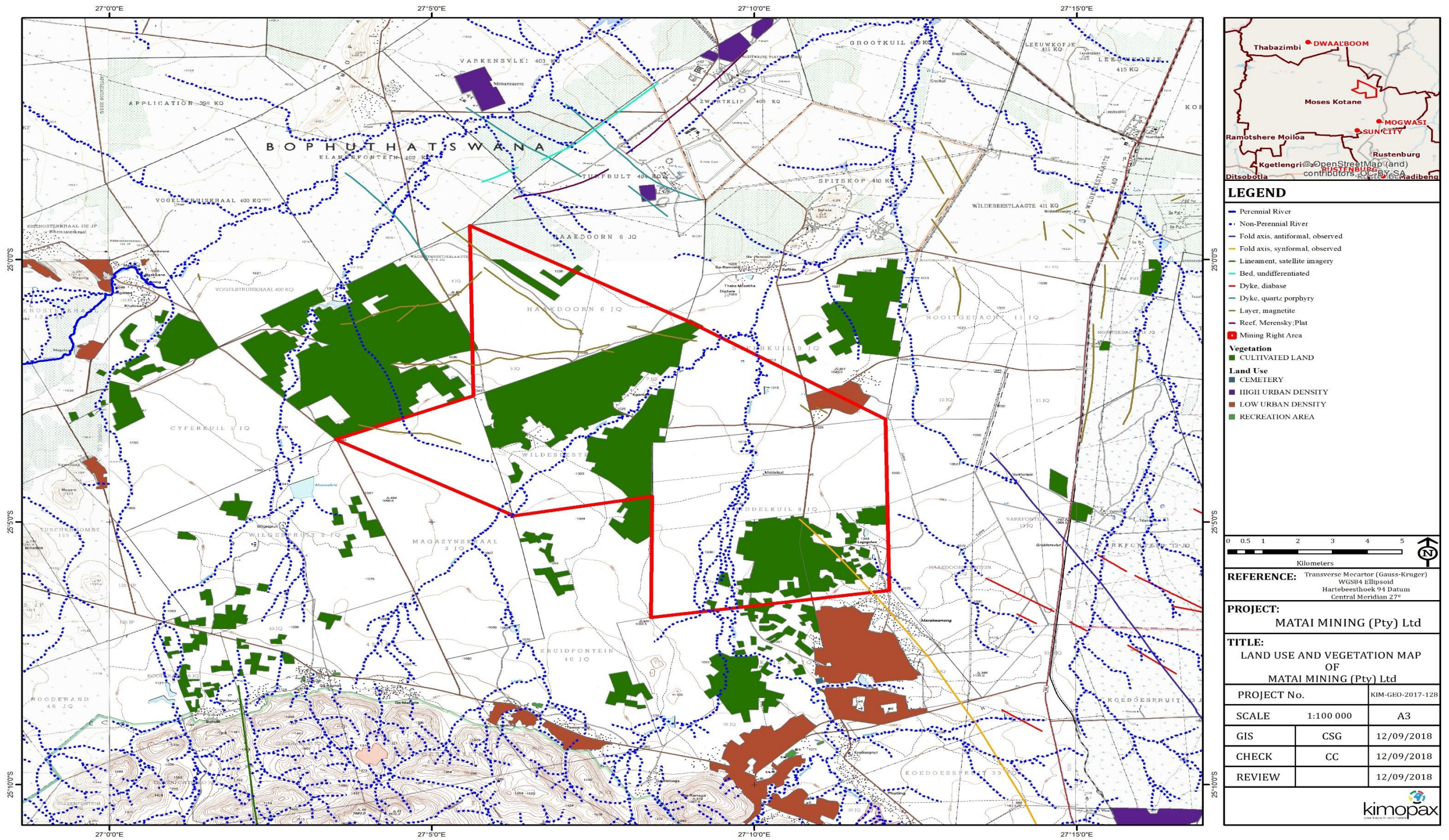


Figure 17: Land-use and vegetation map

12 IMPACTS IDENTIFIED

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

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Table 6: Impacts Identified

Activity	Potential Impact	Significance	Probability	Duration
Open cast mining and related surface infrastructure	<p>Impact on the availability of groundwater.</p> <p>a) Abstraction of groundwater to provide safe mining conditions and water for use in the mine and plant will result in a cone of depression (lowering of the groundwater table) around the mine.</p>	Medium	Definite	Long- Term
	<p>Impact on the quality of groundwater.</p> <p>a) Ineffective handling of hydrocarbons during loading and offloading into the storage tanks may lead to groundwater contamination.</p>	Medium	Definite	Long-Term
	Reduction in air quality.	Medium	Possible	Short-Term

Activity	Potential Impact	Significance	Probability	Duration
	a) Particulate mobilisation by drilling, blasting, loading, hauling, stockpiling, backfilling and tailings storage has the potential for an impact on air quality within and near the project area, particularly in the downwind direction			
	a) Dust generated during the mining may cause a negative visual impact and altered visibility	Medium	Possible	Long-Term
	a) Construction machinery and earthworks may cause a negative visual impact	Medium	Possible	Short-Term
	Day and night time noise impact. a) The noise from the mining machinery will be audible if opencast mining operations are	Medium	Possible	Medium-Term

Activity	Potential Impact	Significance	Probability	Duration
	<p>undertaken during the night time, exceedances of all but the guidelines for industrial districts would be experienced and the noise levels at the nearest sensitive receptors would be objectionable;</p>			
	<p>Noise above ambient noise levels in the surrounding settlements and farm holdings.</p> <p>a) Noise generated by the mining and mining related activities may frighten animals which may lead to injuries, deaths as well as the animals migrating away from the site.</p>	<p>Low</p>	<p>Definite</p>	<p>Long -Term</p>

Activity	Potential Impact	Significance	Probability	Duration
	<p>Alter the overall landscape character (Geology) and sense of place of the region.</p> <p>a) A permanent impact on the localised geology of the areas associated with the proposed open cast mining will result from the mining and removal of Vanadium, Titanium and Iron Ore.</p>	Medium	Definite	Short-Term
	<p>Soil, land use and the degradation of the land capability.</p> <p>a) Removal of topsoil and overburden from the mining area. The removal of topsoil may result in the mixing of the horizons of the soil which will have an impact on the fertility and production potential of the soil. Soil compaction and topsoil loss through erosion may occur as a result of the</p>	Medium	Definite	Long-Term

Activity	Potential Impact	Significance	Probability	Duration
	<p>mining and mining related activities (including the temporary stockpiling). This will further lead to a loss of soil fertility.</p>			
	<p>Clearance of vegetation.</p> <p>a) The indigenous and natural vegetation will be impacted upon within the proposed open casted mining area as a result of clearance of vegetation due to mining</p>	<p>Medium</p>	<p>Possible</p>	<p>Short-Term</p>
	<p>Impact on the animal life.</p> <p>a) Animal life may be moving to and from the mining areas and the adjacent properties, should the mining areas not be demarcated and fenced in, animals may be injured, deaths may result, and the animals</p>	<p>Low</p>	<p>Possible</p>	<p>Short- Term</p>

Activity	Potential Impact	Significance	Probability	Duration
	may damage infrastructure on site. Any poaching, killing or snaring of animals will have a negative impact on animal life. It will result in migration of these species but the lack of suitable habitat in the surrounding areas may further contribute to loss of animal life.			
Activity	Potential Impact	Significance	Probability	Duration
Operation of mine	Employment and Income	Medium	Definite	Medium-term
	Soil erosion	High	Definite	Long-term
	Soil Contamination	Medium	Definite	Long-term
	Dangerous Excavations	High	Definite	Long-term
	Loss of topsoil	Medium	Definite	Long-term
	Job opportunities	Medium	Definite	Medium term

Activity	Potential Impact	Significance	Probability	Duration
Activity	Potential Impact	Significance	Probability	Duration
Decommission and Closure	Loss of biodiversity. If not controlled properly Alien and invasive plant species may establish in disturbed areas.	Low	Unlikely	Short-term
	Dangerous excavations	Medium	Possible	Short-term,
	Job Losses. a) During mine closure, jobs will be lost which may not only impact on the employees but also the socio-economic status of the local community and economy.	Medium	Possible	Short-term

13 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

The significance will be determined by both the extent and duration of the impact. The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk.

Table 7: Parameters of impacts and descriptions

PARAMETERS	DESCRIPTIONS
Extent	Refers to the physical or geographical size that is affected by the impact. It can be categorised into the following ranges: a) Onsite – Within specific site boundary (weight value – 1) b) Local – Within municipal boundary (weight value – 2) c) Regional – Outside municipal boundary (weight value – 3)
Duration	Time span associated with impact: a) Short term – 1 Year or less (weight value – 1) b) Medium term – 1-5 Years (weight value –2) c) Long term – Longer than 5 Years (weight value – 3)
Intensity and reversibility	The severity of an impact on the receiving environment: a) Low – Natural and/or cultural processes continue in a modified way and is reversible (weight value – 1)

	<p>b) Medium – Natural and/or cultural processes stop and is partially reversible (weight value – 2)</p> <p>c) High – Natural and/or cultural processes disturbed to an irreversible state (weight value – 3)</p>
Impact Significance/Consequence	Adding the extent, duration and intensity together provides the significance of the impact (High, Medium or Low). Extent + Duration + Intensity= High/Medium/Low Impact
Probability	<p>The likelihood of an impact occurring:</p> <p>a) Unlikely – 0% - 45% chance of the potential impact occurring (weight value – 1)</p> <p>b) Possible – 46% - 75% chance of the potential impact occurring (weight value – 2)</p> <p>c) Likely - >75% chance of the potential impact occurring (weight value – 3)</p>
Environmental Risk Refer to table below	Multiplication of the significance of the impact by the probability of the impact occurring produces a final conclusion of the overall risk that an impact poses to the surrounding environment. High/Medium/Low Impact X Probability= High/Medium/Low Environmental Risk

Table 8: Significance of Impacts

Significance of Impact				
	Low Impact (1-5)	Medium Impact (6-8)	High Impact (9)	
Probability	Definite/Very Likely (3)	9 - 15 L-M	18-24 M-H	27 H
	Possible (2)	6-10 L-M	12-16 M	18 M-H
	Unlikely (1)	3-5 L	6-8 L	9 L
ENVIRONMENTAL RISK	Guidelines for Control Strategies			
(H)-High	Proactively reduced risk level, short term response			
(M-H) -Medium High	Proactively reduce risk level, short term response			
(M)-Medium	Management strategies to reduce risk level, short to medium term response			
(L-M) Low -Medium	Management strategies to reduce risk level, short to medium term response, operational control and housekeeping			
(L) Low	Operational Control			

13.1 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

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

Table 9: Positive and Negative impact of the proposed activity

Alternative		Advantages	Disadvantages
Activity alternatives (mining method alternatives)	Preferred Alternative (Opencast mining methods)	The shallow nature of Iron Ore, Vanadium and Titanium deposit can easily be mined by means of opencast mining.	Opencast mining methods may result in direct and indirect impacts on several aspects of the environment including: Soil (compaction), flora (clearance and dust), fauna (habitat destruction, noise), air quality (dust, vehicle emissions), noise (animal life and surrounding communities), and surface- and groundwater (spillages, inadequate separation of clean and dirty water, potential leaching of water)
	Alternative 1 (Underground mining method)	In comparison to the preferred alternative, if underground mining would have been feasible there could be less surface-related	Underground mining has greater safety risk to the miners as compared to the open cast mining method. Owing to the shallow nature of the proposed minerals it is not feasible to undertake underground mining.

Alternative		Advantages	Disadvantages
		environmental impacts that would have resulted from mining.	
No-go versus Open cast mining	Open cast Mining	<p>Mining activity was preferred on the proposed site based on the availability of Vanadium, Titanium and Iron-Ore reserves within the area. The open cast mining is preferred such that the shallow nature of the mineral deposit can easily be mined by means of opencast mining.</p> <p>If the mining right is granted local communities will be positively impacted through employment opportunities that will arise and the proposed area's economy will grow through trading activities associated with mining activities like transport, increase in health facility as well as an increase turnover in hospitality and tourism sectors.</p>	<p>Visual impacts</p> <p>The development of the mine will have a visual impact on the proposed area due to deforestation, dust generation and construction activities resulting to the mining activities. The proposed mining activities may be intrusive, in terms of visual aspects, which may result in a change of sense of place to the local community.</p> <p>High crime rate / increase in crime rate</p> <p>Any strong economic activities in South Africa attract crime, if the proposed mining right is granted there is a possibility of increase in crime rate as commuters to the mine will be targeted victims.</p> <p>Dust</p>

Alternative		Advantages	Disadvantages
		<p>Most importantly the proposed mining project will create skills development and community building opportunities to the local community therefore eradicating poverty in such a case stimulating Local Economic Development.</p> <p>Not only that, the business opportunities will be encouraged through infrastructural development as roads will be constructed, this will assist in increasing the demand of goods and services in the affected area/s in a long term.</p> <p>The project will contribute directly and indirectly to the Country's GDP.</p> <p>Moreover, the development will encourage income generation in the area as well as the development of Black Economic Empowerment (BEE) opportunities during</p>	<p>The excavation activities and the use of the access dusty roads will result in the emission of dust into the surrounding atmosphere. This will not only impact on the surrounding communities but also the plants surrounding the area as the dust is deposited on the leaves. This interferes with the photosynthesis process of the plants. Furthermore, animals that feed on the plants will be impacted upon as this will affect their forage.</p> <p>Noise</p> <p>Noise pollution will be generated from the mining activities, namely through the movement of trucks and vehicles, machinery operations, trenching activities. Depending on the size, noise levels of the trucks and excavators may cause the noise to be localised in the specific site.</p> <p>Soil pollution</p> <p>Soil pollution due to the leakages of oil and other industrial liquids from the trucks and machineries. This is a potential risk of soil contamination, which will change the soil</p>

Alternative		Advantages	Disadvantages
		<p>construction, operation and eventual closure and rehabilitation</p>	<p>chemistry and soil nutrients of the affected soil. Ultimately this could also potentially affect the vegetation growth in the contaminated areas.</p> <p>Impact on heritage resources</p> <p>The mining activity could result in danger of negatively impacting on unidentified heritage resources during site assessment however, the possibility of the impact is very minimal as education and training on heritage resources will be given to mine employees.</p> <p>Animal life disruption</p> <p>Due to the impacts of noise, dust, movement and operation of trucks and vehicles, the potential loitering of the employees and the trenching itself will disrupt the surrounding animals. This disruption can further lead to injury or death in cases where animals fall into the trenches.</p> <p>Removal of vegetation</p>

Alternative		Advantages	Disadvantages
			<p>While all means will be applied to minimise disturbance, removal of vegetation cannot be avoided altogether. Deforestation will occur to clear the land for the opencast mining, this will leave the ground bare and prone to erosion.</p> <p>Soil erosion</p> <p>Erosion of the soil will occur through runoff and wind.</p> <p>Habitat destruction</p> <p>The habitat that support the animal within the project site will be disturbed and destructed by the movement and operations during the mining activities. This could possibly cause the relocation of some of the animals, and result in habitat fragmentation.</p> <p>Waste generation</p> <p>Debris (slimes), waste rock, litter and other solid waste will be generated and deposited in and around the site. This could potentially attract nuisance and affect the natural scenery of</p>

Alternative		Advantages	Disadvantages
			<p>the site. The slimes and waste rock will be used to backfill the trenches. This will be undertaken in a concurrent rehabilitation manner.</p> <p>Surface and ground water impacts</p> <p>The hazardous chemical spills may lead to surface water containment and ground water due to the leakages.</p>
	No-go Alternative	<p>The implementation of the no-go option would result in the continuation of the current land uses (farming and livestock grazing). Therefore, no additional impacts on the bio-physical environment will occur, besides those that are currently occurring, and / or which may potentially occur if the areas are not managed appropriately.</p>	<p>It is also very important to note that the implementation of the no-go option may not necessarily prevent the mining of these resources on the property, as other companies may apply to mine the resources, unless the DMR sterilizes the reserves.</p>

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

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

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Table 10: Mitigation measures

Activity	Potential Impact	Stakeholder comment	Mitigation
CONSTRUCTION			
Construction of box cut, related surface infrastructure and overland conveyor belt(s)	Loss of carbon sink capacity due to vegetation clearing		a) Clear only the necessary areas required for construction; b) Conserve wetlands as these systems have been demonstrated to sequester carbon at a greater rate than most other vegetation types.
	Increase in anthropogenic CO ₂ associated with the operation of heavy machinery and mobile generators		a) Use solar panels for lighting and small-scale power supply.
	Increase in emissions associated with the production and use of		a) Investigate suppliers and material use.

Activity	Potential Impact	Stakeholder comment	Mitigation
	steel and concrete		
	Loss of vegetation and subsequent loss of habitat for fauna during site clearance and site establishment		<ul style="list-style-type: none"> a) Removal of vegetation should be restricted to the relevant infrastructure footprints only; b) Topsoil should be stored separately to be used in rehabilitation and landscaping, c) Transformation of natural areas should exclude any areas designated as having high or very high sensitivities; d) Prevent all effluent from the mining activities from entering the wetland habitat e) Management of the topsoil stockpile to preserve the seedbed; f) Fence development footprint area prior to commencement construction; g) No off-road driving into natural vegetation

Activity	Potential Impact	Stakeholder comment	Mitigation
			h) Implement alien invasive species eradication program.
	Loss of soil resource and land use during site clearance and site establishment		a) Limiting the area of impact to as small a footprint as possible, inclusive of waste management facilities, resource stockpiles and the length of servitudes, access and haulage ways and conveyancing systems wherever possible; b) Implement a soil utilization plan; c) Restriction of vehicle movement over unprotected or sensitive areas, this will reduce compaction; d) Topsoil to be stripped and stockpiled separately.

Activity	Potential Impact	Stakeholder comment	Mitigation
	Increased risk of erosion during site clearance and site establishment		<ul style="list-style-type: none"> a) Minimise the construction footprint within any wetland areas. Clearly demarcate the required construction servitude and maintain all activities within the demarcated area; b) Maintain flow connectivity in any valley bottom wetlands during the construction phase by temporarily diverting streams around the construction area; c) Install erosion prevention measures prior to the onset of construction activities;
			<ul style="list-style-type: none"> a) No conveyor footings should be placed within the active channel of any valley bottom wetlands. The active channel should be spanned; b) Development of erosion gullies c) Implement storm water management plan.

Activity	Potential Impact	Stakeholder comment	Mitigation
	Increase in ambient dust levels from site clearance and vehicular activity on dust roads		<ul style="list-style-type: none"> a) Regular watering of the site roads; b) Dressing off of tip faces, unused roads and disturbed areas; c) Minimising unnecessary disturbance of non-operational areas; d) Use of chemical additives to control dust to be employed if necessary.
	Increase in ambient noise levels from equipment use and vehicular activity on dust roads		<ul style="list-style-type: none"> a) Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b) Regular planned vehicle services.
	Pollution of surface water resource from:		<ul style="list-style-type: none"> a) Appropriate storm water management measures will be implemented; b) Servicing of construction vehicles will take place only in dedicated areas that are equipped with drip trays;

Activity	Potential Impact	Stakeholder comment	Mitigation
	<p>a) Erosion of soils during rainfall events, with elevated suspended solids in runoff water</p> <p>b) Resultant elevated suspended solids and sedimentation in watercourses</p> <p>c) Hydrocarbon spillages from fuel storage, servicing areas or construction equipment, with resultant elevated hydrocarbon concentrations in runoff water and watercourses</p>		<p>c) Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil;</p> <p>d) Spill-sorb or a similar product will be kept on site, and used to clean up hydrocarbon spills if they should occur;</p> <p>e) Water quality monitoring will be undertaken downstream of the construction areas, before and during construction where practical, to detect any increase in suspended solids or turbidity;</p> <p>f) Implement appropriate storm water management measures;</p> <p>g) Service of vehicles will take place at dedicated areas with drip trays;</p> <p>h) Hazardous material will be placed in bunded areas;</p>

Activity	Potential Impact	Stakeholder comment	Mitigation
			i) Spill kits to clean up hydrocarbon spills will be available; a) Clean upslope runoff will be diverted around construction areas.
	Potential impact on heritage Resources		a) Conduct heritage impact assessment to identify heritage sites within the project area; b) If any heritage sites are identified, appropriate steps as per the Heritage Resources Act will be undertaken
	Increase in traffic volumes on existing traffic network		a) Traffic signage at site access point; b) Undertake traffic impact study; c) Traffic signage at site access points; d) Upgrade gravel roads to tarred roads.

Activity	Potential Impact	Stakeholder comment	Mitigation
	Spontaneous settlement due to perceived employment opportunities		a) Develop a clear and concise employment and recruitment policy that prioritizes local recruitment; b) Identify and support community development programs that address challenges raised by population influx and spontaneous settlement; c) Support local government capacity for integrated development planning.
	Increase pressure on social services due to influx of job seekers Benefits resulting from employment and income opportunities created by the mine		a) Develop an employment and recruitment policy that prioritizes local recruitment; b) Identify and support community development programs.
OPERATIONAL			

Activity	Potential Impact	Stakeholder comment	Mitigation
Extraction of Vanadium, Titanium and Iron ore	Release of fugitive emissions in the form of N ₂ O, CH ₄ and CO ₂ due to blasting and vehicle operations		<ul style="list-style-type: none"> a) Efficiency will be applied to reduce wastage and unnecessary fuel consumption; b) Carbon offsets will be considered if required; c) Concurrent best practice rehabilitation and vegetation monitoring will be applied to allow for the restoration of some the carbon sink functionality within the mining right area.
	Influx of groundwater into the pits, leading to a decrease in groundwater quality and yield		<ul style="list-style-type: none"> a) Detailed geological mapping to identify geological features; b) Mining will take place according to design mine stability safety factors; c) Mining will not take place in the weathered overlying strata; d) Identify boreholes (undertake hydrocensus) within mining area and plug

Activity	Potential Impact	Stakeholder comment	Mitigation
			deep boreholes to prevent inflow into the pit; e) Monitor groundwater levels and yields of external borehole users.
	The formation of acid mine drainage in groundwater resources		a) Optimise storage of mine water to minimize exposure to oxygen; b) Develop a groundwater monitoring program to assess the groundwater quality c) Should Acid Mine Drainage (AMD) be identified within the groundwater resources, the polluted water will be remediated accordingly.
	Contamination of soil, surface water and wetland resources during operation due to hydrocarbon spills and carbonaceous material		a) Implement storm water management plan; b) Divert clean storm water around construction areas;

Activity	Potential Impact	Stakeholder comment	Mitigation
			<ul style="list-style-type: none"> c) Surface water management structures be constructed first as to ensure that runoff and dirty water spills are contained; d) Spill leak detection plan should be implemented.
	<p>Pollution of surface water resources due to contaminated storm water runoff entering the environment</p>		<ul style="list-style-type: none"> a) All facilities with the potential to generate dirty storm water run-off will be located within the dedicated dirty water area; b) Clean run off will be diverted around the designated dirty water areas by means of cut off canals; c) All dirty storm water and wash-down water will be collected in the pollution control dam.

Activity	Potential Impact	Stakeholder comment	Mitigation
	Contamination of surface and groundwater resulting from the storage of waste		<ul style="list-style-type: none"> a) All waste streams will be characterized to identify any potential risk; b) A suitable pollution control barrier system will be developed; c) A surface and groundwater monitoring systems will be implemented.
	Increase in dust fallout		<ul style="list-style-type: none"> a) Regular watering of the site roads; b) Dressing off tip faces, unused roads and disturbed areas; c) Minimising unnecessary disturbance of non-operational areas; d) Use of chemical additives to control dust to be employed if necessary.
	General increase in ambient noise levels		<ul style="list-style-type: none"> a) Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness;

Activity	Potential Impact	Stakeholder comment	Mitigation
			b) Regular planned vehicle services.
	Spontaneous settlement due to perceived employment opportunities		a) Develop an employment and recruitment policy that prioritises local recruitment; b) Identify and support community development programmes; c) Support local government capacity for integrated development planning.
	Increase pressure on social services due to influx of job seekers		a) SLP to focus on enterprise development and capacity building; b) Support local government in skills development and training initiatives; c) Implement employment policy prioritizing local employment.
	Benefits resulting from employment and income opportunities created by the mine		
DECOMMISSIONING AND CLOSURE			

Activity	Potential Impact	Stakeholder comment	Mitigation
Decommissioning of all surface infrastructure and rehabilitation of all disturbed surface areas	Compaction of soil and contamination of soil resources from heavy vehicles		<ul style="list-style-type: none"> a) Reinstatement of stored soils onto areas of disturbance where infrastructure has been demolished; b) Contour and stabilize slopes to be free-draining; c) Cultivation of growing medium, the planting of required vegetative cover and irrigation if required.
	Potential for establishment of alien invasive vegetation		<ul style="list-style-type: none"> a) Ensure the removal of any alien invasive vegetation encountered on the rehabilitated area; b) Regular inspection of established vegetation.
	Pollution of surface water resources during decommissioning activities		<ul style="list-style-type: none"> a) The storm water management infrastructure, including the PCD, will be decommissioned last to ensure adequate

Activity	Potential Impact	Stakeholder comment	Mitigation
			storm water management during the rehabilitation phase; b) Erosion protection measures will be implemented at steep areas; c) Spill kits will available and hydrocarbon spills will be cleaned up immediately; d) All traces of hydrocarbons and residual waste will be removed before infrastructure is demolished.
	Potential disturbance of wetland habitats		a) Alien vegetation management will be implemented following revegetation to clear alien species; b) Develop a watercourse crossing method statement for demolition of crossings.
	Increase in dust fallout		a) Regular watering of the site roads; b) Dressing off tip faces, unused roads and disturbed areas;

Activity	Potential Impact	Stakeholder comment	Mitigation
			c) Minimising unnecessary disturbance of non-operational areas; d) Use of chemical additives to control dust to be employed if necessary.
	General increase in ambient noise levels		a) Regular planned mobile plant maintenance, with special attention paid to the maintenance of engine efficiency and silencer effectiveness; b) Regular planned vehicle services.
	Loss of employment and enterprise development opportunities		a) Develop and implement Labour and Human Resources Plan (LHRP) that address the impacts associated with retrenchment, job losses and reduced demand for local goods and services; b) Develop a closure plan which will aim to reinforce the objectives of the SLP by reducing the reliance on LCM for

Activity	Potential Impact	Stakeholder comment	Mitigation
			employment by promoting skills transfer to ensure alternative livelihoods portable skills.

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14 THE OUTCOME OF THE SITE SELECTION MATRIX. FINAL SITE LAYOUT PLAN

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

The general objectives of the site selection matrix are to ensure that the activity to be undertaken is environmentally and socially acceptable, and thus sustainable. Considerations in this process are the size (land area) and the strategic location of the main activities and associated infrastructures. The site was selected based on the geographic location of the potentially underlying required mineral reserves. The layout of the site was however selected based on considerations made for the surrounding environment where possible, ease of operations and mining activities on site as well as minimal disturbance to the community near the site. The site/land area for run of activity was selected based on the size (according to the geology of the area), and position and of the mineral reserves to be exploited.

15 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

The site for the proposed open-cast mining operations was selected based on availability of Vanadium, Titanium and Iron- Ore reserves to be mined. Minerals can only be mined where there are identified and verified, therefore it was not practical to select any other sites. The No-Go option is the only other alternative identified during the Scoping phase. If the proposed operation were not to proceed, the land may or may not be utilized for agricultural, or grazing activities in the future. It is worth noting that as much as the no go option may result in the protection of the environment in situ; the consequences of not proceeding with the proposed operation will include the forfeiture of a mining opportunity and therefore the loss of support towards the Moses Kotane municipality. It would further suggest that no new employment opportunities would be created as well as any resultant community upliftment and development programs would likely take place in the surrounding communities.

If an alternative resource cannot be identified this will limit the development of the proposed mine. The site is therefore regarded as the preferred site and alternative sites are not considered.

15.1 Statement Motivating the Preferred Site.

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

The location of the proposed mining activity was influenced by the following factors;

- a) Availability of the Vanadium, Titanium and Iron Ore;
- b) Land ownership;
- c) Geo-hydrological impacts; and
- d) Available transport modes and routes.

The proposed layout is therefore the most suitable and economically/environmental viable option for the open pit mining.

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16 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

16.1.1 Surface Mining

This form of mining differs from extractive methods that require tunnelling into the earth, such as long wall mining. Open-pit mines are used when deposits of commercially useful ore or rocks are found near the surface; that is, where the overburden (surface material covering the valuable deposit) is relatively thin or the material of interest is structurally unsuitable for tunnelling (as would be the case for sand, cinder, and gravel).

16.1.2 Extraction

Open-cast mines are dug on benches, which describe vertical levels of the hole. These benches are usually on four to sixty-meter intervals, depending on the size of the machinery that is being used. Most walls of the pit are generally mined on an angle less than vertical, to prevent and minimize damage and danger from rock falls. This depends on how weathered the rocks are (eroded rocks), and the type of rock, and also how many structural weaknesses occur within the rocks, such as a faults, shears, joints or foliations.

The walls are stepped. The inclined section of the wall is known as the batter, and the flat part of the step is known as the bench or berm. The steps in the walls help prevent rock falls continuing down the entire face of the wall. In some instances, additional ground support is required and rock bolts, cable bolts and shotcrete are used. De-watering bores may be used to relieve water pressure by drilling horizontally into the wall, which is often enough to cause failures in the wall by itself.

A haul road is usually situated at the side of the pit, forming a ramp up which trucks can drive, carrying ore and waste rock. Waste rock is hauled to a waste dump. Waste dumps can be piled at the surface of the active pit, or in previously mined pits.

16.1.3 Design or Layout

The proposed layout provided by Matai is conceptual in nature and will be optimized based on site specific conditions that layout remains technically and economically feasible.

16.1.4 Land use alternatives.

In accordance with the current land use in the vicinity of the proposed project area, an alternative to the project would be subsistence farming and livestock grazing and residential purpose as there are residential stands close to the proposed site. The current land use will be considered the post rehabilitation land use alternatives, the only option considered to date is rehabilitated back to the current land use capability

16.1.5 No Go Option

The option of not proceeding would mean that the environmental and social status would remain the same as current. This implies that both negative and positive impacts would not take place. As such, negative impacts on biodiversity, water resources, air quality, land use would not transpire but also that the positive impacts such as economic development, employment creation, skills development and poverty alleviation would not occur. And the spin-off benefits associated with the export of the ore will also go unrealised.

17 DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

Table 11:Aspects to be assessed

Environmental Aspect	Potential Impact	Activities
Soil	Soil compaction	a) Open pit development; b) Trenches and foundations for surface infrastructure development;
	Soil erosion	(a) Removal of vegetation; (b) Topsoil stripping; (c) Stockpiles; (d) Road development;
	Soil pollution	a) Oil and fuel spills from vehicles; b) Waste generation; c) Leakage from waste storage facilities;
	Sterilization of topsoil layer	(a) Stripping of topsoil during construction will remove this fertile layer;

Environmental Aspect	Potential Impact	Activities
Fauna	Loss of faunal habitat and ecological structure	<ul style="list-style-type: none"> a) Placement of infrastructure within sensitive faunal habitat areas; b) Site clearing and the removal of faunal habitat; c) Inadequate design of infrastructure; d) Construction of infrastructure; e) Construction of access and haul roads; f) Fire;
	Loss of faunal diversity and community integrity	<ul style="list-style-type: none"> a) Use of subject property; a) Construction related; disturbance; b) Removal of faunal habitat and migratory corridors; c) Collision of construction; vehicles with faunal species; d) Vehicles accessing site; e) Poaching;
Surface Water	Reduction in resources	<ul style="list-style-type: none"> a) Use of Potable water;
	Reduction in surface water quantity	<ul style="list-style-type: none"> a) River diversions; b) Opencast and construction activities at tributaries;
	Deterioration in water	<ul style="list-style-type: none"> a) River diversions (bridges & Opencast sections);

Environmental Aspect	Potential Impact	Activities
	quality	b) Spilled construction materials such as cement, paint, fuel and oil;
	Water/ deterioration of surface water quality	c) Chemical contaminants; d) Vehicle wash bays and workshop; e) Spillages from sanitary conveniences, fuel deposits or storage facilities;
Ground Water	Impact on the availability of groundwater	a) Developmet of the blasting opencast mining
	Impact on the quality of groundwater	
Air Quality	Reduction in air quality	a) The dust and vehicle emissions generated by the mining activities;
Noise	Day and night time noise impact	a) Preparation of the boxcut area b) Waste Rock Dump area (close to noise sensitive area);
	Noise above ambient noise levels in the surrounding settlements and farm holdings	c) Bulldozer clearing vegetation and topsoil; d) Excavator loading topsoil/softs on LHD trucks for removal to stockpiles; e) Drilling activities; f) LHD trucks idling or offloading; g) Pouring of concrete for foundations at plant; and

Environmental Aspect	Potential Impact	Activities
		h) Diesel generator.
Visual	Alter the overall landscape character and sense of place of the region	a) Preparing and planning of the site; b) Construction of mining infrastructure; c) Siting of mining infrastructure; d) Construction of mining infrastructure such - offices and plant areas; e) Removal of vegetation; and f) Loss of topsoil and creation of topsoil stockpiles.
	Dust generated during the construction phase may cause negative visual impacts	a) Preparing and planning of site; b) Construction of infrastructure; c) Removal of vegetation cover; and d) Dust generation due to movement of vehicles
	The mining facilities may impact negatively on receptors (residents and motorists) situated in or utilising the identified receptor sites	a) Preparing and planning of the site; a) Construction of mining infrastructure; b) Siting of mining infrastructure; c) Construction of mining infrastructure such as offices and plant areas; d) Removal of vegetation;

Environmental Aspect	Potential Impact	Activities
Cultural and Heritage Aspects	Destruction of heritage or cultural aspects	a) Construction of mining infrastructure;
Socio-economic aspects	Economic Opportunities, Infrastructure Development and Employment	b) Increase in disposable income may create negative social impacts such as crime, alcoholism and prostitution in and around the project area.
	Loss of current land capability	c) Change of land use from natural vegetation and agriculture (livestock grazing and commercial) to industrial.
	Crime, Health and HIV	a) Influx of foreigners and job seekers and increase in disposable income for local people may create negative social impacts such as crime, alcoholism and prostitution in and around the project area.

17.1 Description of aspects to be assessed by Specialists

Several specialist were appointed to conduct studies on various aspects of the bio-physical and cultural environment, and include:

17.1.1 Air Quality Assessment

This study will include the following tasks:

- a) Develop a dust emissions inventory
- b) Develop a dust dispersion model to simulate dust emissions from the proposed operation
- c) Assess the significance of air quality impacts

17.1.2 Visual impact assessment

A visual specialist study will be conducted for the project. The objectives of this study will be to:

- a) Examine the baseline information (contours, mine infrastructure dimensions, vegetation, inter alia);
- b) Determine the area from which any part of the mine may be visible (view shed);
- c) Identify the locations from which views of the mine may be visible (observation sites), which include buildings and roads;
- d) Analyse the observation sites to determine the potential level of visual impact that may result from the mine;
- e) Identify measures available to mitigate the potential impacts; and
- f) Compile a visual assessment report, indicating findings, fatal flaws, recommendations and maps indicating sensitive and/or no-go areas

17.1.3 Socio-Economic Studies

A socio-economic specialist study will be conducted for the project. The objectives of this study will be to identify socio-economic impacts of the proposed project on:

- a) The regional economy;
- b) Local service providers;
- c) Employment;
- d) Housing;

- e) Infrastructure and services;
- f) Health; and
- g) Education and training.

17.1.4 Ecological Studies

This study will include the following tasks:

- a) Identify and map terrestrial and aquatic habitat types in the project area in the wet season;
- b) Rank each habitat type based on conservation importance and ecological sensitivity; and
- c) Assess the significance of biodiversity impact.

17.1.5 Surface water and Wetland impact assessment

Kimopax will conduct the surface water study in house. The investigation will include the following tasks:

- d) Develop a detailed baseline hydrological description of the selected site and immediate surrounds. This will include surface water quality sampling;
- e) Determine the rainfall intensities per month (1hr, 24hr, 24hr 1:50, 24hr 1:100);
- f) Determine the mean monthly rainfall and evaporation;
- g) Determine the mean annual runoff from the mine;
- h) Determine the drainage density of areas to be disturbed;
- i) Delineate the 1:100-year flood lines where relevant;
- j) Identification and assessment of potential impacts of the development on surface water (quantity and quality); and
- k) Development of relevant management and mitigation measures including a detailed storm water management plan.

17.1.6 Geohydrological Investigations

The groundwater detailed investigation will address dewatering and pollution aspects. The investigation will include the following tasks:

- a) Conduct a hydro census;
- b) Develop a conceptual model;
- c) Model the dewatering impacts of the proposed open pit mining;

- d) Model the potential pollution of the proposed open pit mining and associated infrastructure and activities; and
- e) Assess the significance of dewatering and contamination impacts.

17.1.7 Traffic impact assessment

This study will access the following tasks:

- a) Characterisation of the baseline traffic conditions; and
- b) Assess the impact of the proposed project on the traffic levels, road condition and road safety.

17.1.8 Heritage and Archaeological Assessment Study

The objectives of the literature search and site walkover survey are as follows:

- a) To describe and map any identified archaeological, historical, cultural, religious and natural unique sites within the vicinity of the Site; To obtain Global Positioning System (GPS) readings;
- b) to delineate identified heritage receptor boundaries so that accurate polygons can be created for Geographical Information Systems (GIS) applications;
- c) To record by means of written, photographic, annotated map and GPS entries, the details of each identified heritage receptor to allow the location, scale, form, function, date and relative importance of each to be ascertained; and
- d) To provide a written account that details the discoveries made and which characterises the significance of the cultural heritage resources identified by the survey.

17.1.9 Soil and land capability

A soil and land capability specialist study will be conducted for the project. The objectives of this study will be to:

- a) Investigate and study the soils (survey, mapping including profiling and interpretation) and use the taxonomic soil classification system to characterise and classify the soils of the overall area on a comprehensive grid base for the study of the opencast mining and roadway;
- b) Assess and rate the land capability (mapping and interpretation) using the SA Chamber of Mines methodology for assessing land capability;

- c) Assess the sensitivity of the soils and land to disturbance as part of an impact assessment process;
- d) Develop a dominant soils/land form map and land capability plan for the areas that will be affected with specific emphasis on areas of high biodiversity sensitivity
- e) Propose mitigation measures to reduce or mitigate potential impacts; and
- f) Compile a specialist report based on the results of the study.

17.1.10 Noise Assessment Study

A quantitative noise specialist study will be conducted for the project. The objectives of this study will be to:

- a) Review existing noise management plans and impact assessments;
- b) Conduct a baseline study of existing environmental noise levels;
- c) Model noise propagation; Assess noise impacts; and
- d) Develop an environmental noise management plan for proposed changes to mining plan; and compile a comprehensive noise impact assessment report detailing all of the above.

These specialist studies, and their respective reports will also be included and discussed in the EIA and EMP phase of the project.

17.1.11 Blasting and Vibration

A detailed study will be prepared using data captured. Applicable aspects will be presented as different sections in the final report and will focus on:

- a) Background information of the site
- b) Mining operations and/or blasting operation requirements
- c) Effects of Blasting operations: Ground vibration, Air blast, Fly rock, Noxious fumes
- d) Site specific aspects applicable:
 - Ground vibration Prediction and Modelling
 - Air blast Prediction and Modelling
 - Fly-rock Prediction and Modelling
 - Noxious fumes Information

18 PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS INCLUDING THE PROPOSED METHOD OF ASSESSING ALTERNATIVES

18.1 Identification and description of impacts

The purpose of undertaking an impact assessment is to ensure that the project proactively considers environmental issues as part of the project planning and decision-making processes throughout the project life cycle.

For each environmental component (i.e. visual, air quality, health), impacts will be identified and described in terms of: detectability / visibility of the impact, exposure of receptors to the impact, compliance with legislation and standards, other applicable targets, limits or thresholds of concern, the level of change / intrusion imposed, and receptor sensitivity. The impact assessment phase will consider:

- a) Physical, biological, social and economic components of the environment and their interrelationships;
- b) The ability of receptors and affected parties to adapt to changes and thus maintain livelihoods after the operation has closed;
- c) The effects of all stages of the project life cycle, including planning construction, operation, decommissioning and post closure;
- d) Positive and negative environmental and social impacts;
- e) Direct, indirect and cumulative impacts;
- f) Short- and long-duration impacts within the zone(s) of influence, and extreme events;
- g) Potential trans-boundary effects and global impacts (e.g. air pollution, withdrawal of water from an inter-provincial waterway and emission of greenhouse gasses); and
- h) Potential impacts on local communities and/or other vulnerable individuals or groups.

18.1.1 Existing Impacts

As previously highlighted the proposed mine is situated in an area affected in past and present by various activities such as agriculture and residential,

18.1.2 Direct Impacts

These are impacts that occur through direct interaction of an activity with an environmental, social, or economic component, these impacts are normally analysed in isolation (impacts of an individual activity). The predicted direct impacts include erosion, formation of sinkholes, loss of biodiversity, and contamination of soil, groundwater and surface water by chemicals from mining processes.

18.1.3 No-Go Development Impacts

The no go option may result in the protection of the environment however if the mining activity is not conducted the mining Right opportunity will be forfeited and it would further suggest that no new employment opportunities would be created.

18.1.4 Cumulative Impacts

As per the requirements and the principles of integrated environmental management, the cumulative impacts must be considered for the proposed development. Noise impact emanating from the mining activity combined with the ambient noise emissions from Siyanda Resources Union Mine and Chrome mine the agricultural activities and the surrounding communities may result in adverse accumulated impacts.

In addition, the proposed Matai mining activities together with the surrounding current mining activities may collectively have an impact on the regional geological strata. It is worth noting, moreover that the potential destruction of the natural vegetation and the habitat loss for fauna species, may occur on a cumulative scale, in case other activities in the area have a similar impact on the biodiversity of the area. The ambient air quality deteriorates from the collective dust resulting from the proposed mining and the current mining activities.

Moreover, additive to the current mining and other related activities, visual impacts may be mounted in nature as a result of the proposed mining activities.

For this project, cumulative impacts will be determined as:

Existing Impacts + Direct Impacts = Cumulative Impacts

18.1.5 Impact Mitigation

The significance of environmental impacts will be rated before and after the implementation of mitigation measures. The impact rating system considers the confidence level that can be placed on the successful implementation of the mitigation.

18.2 The proposed method of assessing duration significance

It has been discussed in section 13

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19 MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED.

Table 12: Measures to avoid, reverse, mitigate and manage impacts

Activity	Potential Impact	Mitigation measure	Potential for residual risk
Excavations/ land clearance	Removal of topsoil during mining process and other related activities.	<ul style="list-style-type: none"> a) Topsoil is to be utilised as soon as possible for the rehabilitation activities. b) Follow the soil utilisation plan. c) Topsoil separation from subsoil. d) Stripping of vegetation and soil should only be practised concurrently with area to be worked on to avoid bare soil exposition. 	<p>Medium</p> <p>If mitigated / managed appropriately. If rehabilitation is not implemented adequately, a residual impact on land use and land capability may occur.</p>

Activity	Potential Impact	Mitigation measure	Potential for residual risk
Excavations/ land clearance	<p>Loss of flora due to the clearance of vegetation. The indigenous and natural vegetation will be impacted upon within the proposed open cast mining area as a result of clearance of vegetation and mining and related activities.</p> <p>Alien and invasive plant species may be established in disturbed areas, if not controlled properly.</p>	<p>a) Removal of vegetation should only be permitted in working areas.</p> <p>b) Areas with high sensitivity should be buffered and marked as No-go areas.</p>	<p>Medium</p> <p>The clearance of natural vegetation is regarded as a significant impact. However, should rehabilitation to as close as pre-mining conditions be undertaken appropriately and adequately, as well as the control of alien invasive species, a residual impact on vegetation may be prevented</p>
Blasting	Mining and mining related activities may result to noise that will	a) Blasting and other noise generating activities should be conducted during the day	<p>Low.</p> <p>If mitigated / managed appropriately.</p>

Activity	Potential Impact	Mitigation measure	Potential for residual risk
	frighten animals which may lead to animals migrating away from the site, injuries, and deaths.	when surrounding noise levels is high.	
Excavations/ land clearance	Due to the mining and other mining activities (i.e. excavation, movement of vehicles etc.), dust may be generated which may have an impact on the ambient air quality of the area.	a) Dust suppression methods including the wet suppression should be implemented.	Low Dust generation will decrease when construction activities ceases. Dust can be expected during operation (i.e. generated by movement of vehicles) however it will be infrequent
Drilling and blasting	Open cast mining including drilling, blasting, removal of vegetation, topsoil, overburden and the	a) A complaints register must be kept onsite. The register must record the following: Date when complaint was received, name of person who reported	Low. Mining and related activities will have ceased after closure, and therefore noise will no longer be generated.

Activity	Potential Impact	Mitigation measure	Potential for residual risk
	<p>transportation of mined material will produce noise which may impact on the surrounding landowners.</p>	<p>the complaint, details of the complaint and when and how concern was addressed.</p>	
<p>Accommodation and other infrastructure</p>	<p>Visual impact will affect character and “sense of place”.</p>	<p>a) The shaded office area, portable ablution facilities, vertical water tanks and any other infrastructure should be acquired with a consideration for colour. Natural earth, green and mat black options which will blend in with the surrounding area must be favoured.</p>	<p>Medium</p>

Activity	Potential Impact	Mitigation measure	Potential for residual risk
<p>Transportation and Storage of hazardous waste</p>	<p>Spillages of hydrocarbons. In the event of chemical or hydrocarbon spillages on soil, surface water runoff which comes into contact with the soil may become contaminated and enter the receiving environment and / or water resources. This will have an impact on, not only the surface water quality, but the aquatic vegetation, animal life and any other downstream water users.</p>	<p>a) Vehicles and machinery must be checked and maintained on a regular basis. Drip trays must be placed under trucks to contain leaks. Storage of hazardous waste (empty fuel or oil cans) must be disposed of in a bunded skip with an impermeable liner. Spills to be cleared immediately.</p> <p>b) Hazardous wastes must be separated from general wastes, stored within secondary containment in appropriate containers until collected by oil recycling company or similar</p> <p>c) No wastewater or waste will be disposed of into the</p>	<p>Low.</p> <p>If mitigated / managed appropriately.</p>

Activity	Potential Impact	Mitigation measure	Potential for residual risk
		<p>surrounding environment at any time. Water collected in bunds must be collected in containers and disposed of as hazardous waste.</p>	
Storage of hydrocarbons	<p>Ineffective handling of hydrocarbons may lead to spillage of hydrocarbons which may potentially contaminate groundwater.</p>	<p>a) Storm water management plan should be designed before any activities could prevail. b) Designate fixing and refuelling bays and should be away from the impermeable base.</p>	<p>Low If mitigated / managed properly</p>
Excavations	<p>Open cast mining of Vanadium, Titanium and Iron Ore results to a permanent impact on the</p>	<p>a) Excavation to be undertaken in the portion of the area with the required minerals and the layout to be followed.</p>	<p>High</p>

Activity	Potential Impact	Mitigation measure	Potential for residual risk
	localised geology of the areas associated with the proposed mining.		
Employment	Mining and mining related activities will result to the generation Job opportunities, along with other benefits arising from the Social and Labour Plan.	a) Positive impact that need to be enhanced.	Medium

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20 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No specific information has been requested by the Competent Authority so far.

21 IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix).

The proposed mining right application will present the negative and positive socio-economic impacts. Positive socio-economic conditions associated with the proposed development.

- a) Creation of job opportunities assisting in the reduction of economic imbalances within the previously disadvantaged communities.
- b) Economic growth of the North-West provinces through trade mechanisms and tourism
- c) National increase of the GDP through mining of Vanadium, Titanium and Iron-Ore

Negative socio-economic conditions associated with the proposed development.

- a) Increased crime rate associated with this mining development.
- b) Increase in Sexual transmitted disease as the towns may experience an influx of labour migrants.
- c) Overcrowding.

22 IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the

National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12. herein).

To be attached after Heritage Impact Study or Assessment

23 OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT.

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

Section 24(4)(b) of the NEMA (1998) states that the following:

“24(4) Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment -

(b) must include, with respect to every application for an environmental authorisation and where applicable

(i) investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity;”

Excluding the no go area, no reasonable or feasible alternative was considered for the proposed activity

24 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I Charles Chigurah herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected parties has been correctly recorded in the report.

Signature of the EAP

DATE:

DRAFT

25 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I Charles Chigurah herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of the EAP

DATE:

-END-

26 REFERENCES

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APPENDIX B: EAP QUALIFICATION

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APPENDIX C: EAP CV

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APPENDIX D: PUBLIC PARTICIPATION PROCESS

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APPENDIX E: MINE LAYOUT PLAN

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APPENDIX F: SITE MAPS

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Head Office: 546 16th Road, Constantia Park, Midrand, 1685

Tel: +27 11 312 9765 Fax: +27 11 312 9768/ +27 86 219 8717

Eastern Cape: 62 Bonza Bay Road, Beacon Bay, East London, 5247

Tel: +27 43 721 0178 Fax: +27 86 558 7022

Limpopo: 17 A Plein Street, Polokwane, 0700

Tel: +27 15 295 4849 Fax: +27 86 218 2757

Mpumalanga: 40 John Magagula Street, Middelburg, 1050

Tel: +27 13 243 0680 Fax: +27 86 219 8717