BASIC ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

MINING PERMIT APPLICATION FOR COAL ON A PORTION OF THE REMAINING EXTENT OF THE FARM KLIPSPRUIT 138 HT, SITUATED IN THE MAGISTERIAL DISTRICT OF MKHONDO (WAKKERSTROOM), MPUMALANGA PROVINCE.

DMRE REF: MP 30/5/1/3/2/13020 MP

PREPARED ON BEHALF OF:

VERNEX HOLDINGS (PTY) LTD

4695 MONYAI STREET,
ACKERVILLE, WITBANK, MPUMALANGA,
1039

Contact person: Mr William Sindane

Tel No.: +27 63 342 6983

Email: wlmprojects2@gmail.com

PREPARED BY:

Singo Consulting (Pty) Ltd

Singo Consulting (Pty) Ltd
Office 870, 5 Balalaika Street, Tasbet Park Ext 2,
Witbank, 1040
Tel: +27 13 692 0041
Cell: +27 76 356 4443
Fax: +27 86 514 4103

E-mail: zwivhuya@singoconsulting.co.za
admin@singoconsulting.co.za

PREPARED FOR:

mineral resources & energy
Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA

Saveways Crescent Centre
Mandela Drive
eMalahleni, 1035

2022

mineral resources & energy
Department:
Mineral Resources and Energy
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

AND

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

PROPONENT:

Proponent	Contact details
VERNEX HOLDINGS (PTY) LTD	**Contact person**: Mr William Sindane **Tel No.:** +27 63 342 6983 **Email:** wlmprojects2@gmail.com

FILE REFERENCE NO. MP 30/5/1/3/2/13020 MP

DOCUMENT CONTROL

Document Title: Basic Assessment Report and Environmental Management Programme report for Coal within Portion of the remaining extent of the Farm Klipspruit 138 HT, situated in the Magisterial District of Mkhondo (Wakkerstroom) in Mpumalanga Province **DMRE REF: MP 30/5/1/3/2/13020 MP.**

Version 1: Draft Basic Assessment Report and Environmental Management Programme

	QUALITY CONTROL			
	Compiled By	**1ST Reviewer**	**2nd Reviewer**	**Distribution**
Name	Z.F Tshabuse	R Shonisani	Dr NK Singo	Distribution for Stakeholder review and comment period
Designation	Environmental Technician	EAP	Principal EAP	

DISCLAIMER

The opinions expressed in this Report have been based on the information sourced by Singo consulting through desktop studies, Previous studies, and the local knowledge of land occupiers/ landowners. Opinions presented in this report apply to the site conditions and features as they existed at the time of Singo Consulting's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which Singo Consulting had no prior knowledge nor had the opportunity to evaluate.

EXECUTIVE SUMMARY

Singo Consulting (Pty) Ltd has been appointed as an independent Environmental Consultant by Vernex Holdings (Pty) Ltd to conduct Environmental Impact Assessment (EIA), Compile an Environmental Management Programme report (EMPr) and undertake Public Participation Process (PPP). This is done for processes of acquiring Environmental Authorization for the proposed Coal Mining Permit Application within Portion of the remaining extent of the Farm Klipspruit 138 HT, situated in the Magisterial District of Mkhondo (Wakkerstroom) in Mpumalanga Province (DMRE REF: MP 30/5/1/3/2/13020 MP). The proposed mining permit Application encompasses Portion of the remaining extent of the Farm Klipspruit 138 HT constituting a total of 5 hectares.

There is additional 12+ applications lodged by Singo Consulting (Pty) Ltd on behalf of applicants within 10 km radius from the proposed prospecting right application. Amongst others, applications includes the mining permit application by Epworth Minerals (Pty) Ltd for coal mining activities on all portions of the remaining extent of the Farm Klipspruit 138 HT (MP 30/5/1/3/2/13678 MP); mining right application by Lazalelihlokohloko Mining and Projects (Pty) Ltd on various portions of the Farm Mooihoek 168 HT, Klipspruit 136 HT, Klipspruit 137 HT, Klipspruit 138 HT(MP 30/5/1/2/2/10230 MR) and mining permit on the remaining extent of the farm Klipspruit 138 HT (MP 30/5/1/3/2/13679 MP)

The proposed mining permit application encompasses portion of the remaining extent of the Farm Klipspruit 138 HT constituting a total of 5 hectares. The area is located in close proximity of one of the Rural nodes/Settlements; within 18.69 km northeast of Dirkiesdorp of the Mkhondo Local Municipality. The proposed project area is located along unnamed road which connects to R543, which links the Piet Retief and Dirkiesdorp Town. The tertiary road connecting to R543 to the project area is in good shape. The project area is mainly compromised of natural vegetation, Plantation and surrounded by few waterbodies and wetlands. During site assessment, sinkholes and diggings were found on site. According to the terrestrial biodiversity map produced by GIS specialist, it shows that the proposed area falls within Heavily Modified. Heavily modified are transferred areas, where biodiversity and ecological function have been lost to the point that they are not worth considering for conservation at all.

Mining Permit Application has been submitted for the exploitation of Coal resources on the property mentioned above. Mining activities will be undertaken over a period of two (2) years. The mineral resource of interest is at shallow depth hence surface mining method, particularly open cast mining method of excavation will be utilised in this proposed project. The mine design will be developed according to the dimension of the applied mineral deposit within the project area, but overall mining

activities will be limited to an area of 5 Ha as per mining permit requirements. The topsoil will be stockpiled elsewhere on site preferably next to the farm boundary and will be used during rehabilitation period.

Once a box cut has been made, the overburden and mineral resources where necessary will be loosened by blasting with non-conventional explosives such as Non-Ex Rock Breaking Cartridges also used by Samancor Chrome in Gauteng and Waterkloof mine in Rustenburg. Non-Ex Rock Breaking Cartridges are a pyrotechnic composition (low explosives) that break rocks by generating tensile force through rapid gas expansion in a sealed (stemmed) drill hole and have no adverse environmental effects. The loosened material will then be loaded onto trucks by excavators. A haul road will be situated at the side of the open cast, forming a ramp up which trucks can drive, carrying coal and waste rock. Waste rock will be piled up at the surface, near the edge of the open cast (waste dump). The waste dump will be tiered and stepped, to minimize degradation. All the activities will be guided by the project's EMPr such that the project does not impact the environment negatively.

This Mining Permit application requires authorization in terms of the following interlinked pieces of legislation: the Mineral and Petroleum Resources Development Act, 2002 (MPRDA, Act 28 of 2002), as amended and the National Environmental Management Act, 1998 (NEMA, Act 107 of 1998), as amended. These pieces of core legislation stipulate the required studies, reports, and legal processes to be conducted and the results thereof are to be submitted to the relevant authorities for approval prior to commencement. The project was announced through publication of newspaper and plugging site notices. Stakeholders and landowners were consulted through emails.

The project infrastructure and activities will include:

- Site clearance.
- Removal of topsoil and overburden and stockpiling.
- Site establishment, including the establishment of an access route, mobilization of equipment and preparation of area for mining.
- Excavation of a box cut.
- Ripping (Blasting for hard rock)
- Loading zone.
- Loading and dust control.
- Hauling and transporting of ore.
- Ablution facilities and waste storage area.
- Rehabilitation of site

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process-

a) Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context.
b) Identify the alternatives considered, including the activity, location, and technology alternatives.
c) Describe the need and desirability of the proposed alternatives.
d) Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and the technology alternatives on these aspects to determine:

    i. The nature, significance, consequence, extent, duration, and probability of the impacts occurring; and

    ii. The degree to which these impacts

        (aa) Can be reversed.

        (ba) May cause irreplaceable loss of resources.

        (ca) Can be managed, avoided or mitigated.

e) Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to –

    i. Identify and motivate a preferred site, activity and technology alternative.
    ii. Identify suitable measures to manage, avoid or mitigate identified impacts.
    iii. Identify residual risks that need to be managed and monitored.

This report has been designed to meet the requirements for a Basic Assessment Report and Environmental Management Programme as stipulated in the 2014 Environmental Impact Assessment Regulations (as amended) promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998). The adjudicating authority for this application is the Department of Mineral Resources and this report has been compiled in accordance with the applicable Department of Mineral Resources Guidelines and Basic Assessment Report and Environmental Management Programme template.

List of abbreviations

AEL	: Air Emissions License
APPA	: Atmospheric Pollution Prevention Act
BAR	: Basic Assessment Report
BID	: Background Information Document
DMRE	: Department of Mineral Resources & Energy
DEDET	: Department of Economic Development, Environment and Tourism
DWS	: Department of Water and Sanitation
DWAF	: Department of Water Affairs and Forestry
DEA	: Department of Environmental Affairs
DRDLR	: Department of Rural Development and Land Reform
EA	: Environmental Authorisation
EAP	: Environmental Assessment Practitioner
EIA	: Environmental Impact Assessment
EIMS	: Environmental Impact Management Services
EMPr	: Environmental Management Programme report
ECA	: Environmental Conservation Act
EHS	: Environmental, Health, and Safety
FPA	: Fire Protection Agency
GIS	: Geographic Information System
I&AP	: Interest and Affected Party
IWULA	: Integrated Water Use License Application
IWWMP	: Integrated Water and Waste Management Plan
MP	: Mining Permit
MPRDA	: Mineral and Petroleum Resources Development Act
NEMA	: National Environmental Management Act
NEMWA	: National Environmental Management Waste Act
NWA	: National Water Act
NEMAQA	: National Environmental Management Air Quality Act
PPP	: Public Participation Process
PRA	: Prospecting Right Application
PWP	: Prospecting Works Programme
IDP	: Integrated Development Plan
RSIP	: Rehabilitation Strategy and Implementation Plan
SDF	: Spatial Development Framework
SHE	: Safety, Health and Environmental
SAWQG	: South African Water Quality Guidelines
TOPS	: Threatened and Protected Species
WML	: Waste Management License

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

PART A:

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1 INTRODUCTION

Singo Consulting (Pty) Ltd has been appointed as an independent Environmental Consultant by Vernex Holdings (Pty) Ltd to conduct Environmental Impact Assessment (EIA), Compile an Environmental Management Programme report (EMPr) and undertake Public Participation Process (PPP). This is done for processes of acquiring Environmental Authorization for the proposed Coal Mining Permit Application within Portion of the remaining extent of the Farm Klipspruit 138 HT, situated in the Magisterial District of Mkhondo (Wakkerstroom) in Mpumalanga Province (DMRE REF: MP 30/5/1/3/2/13020 MP).

Coal mining activities will be undertaken over a period of two (2) years. Period with an option to renew for three (3) periods, each of which may not exceed 5 years (5) year if the mining programme is not completed. This project will entail an open cast method of excavation. The mine design will be developed according to the dimension of the applied mineral deposit within the project area, but overall mining activities will be limited to an area of 5 Ha as per mining permit requirements. The topsoil will be stockpiled elsewhere on site preferably next to the farm boundary and will be used during rehabilitation period. Once a box cut has been made, the overburden and mineral resources where necessary will be loosened by blasting. The loosened material will then be loaded onto trucks by excavators. A haul road will be situated at the side of the open cast, forming a ramp up which trucks can drive, carrying ore and waste rock. Waste rock will be piled up at the surface, near the edge of the open cast (waste dump). The waste dump will be tiered and stepped, to minimize degradation. All the activities will be guided by the project's EMPr which must be viewed as a day-to-day management document as it essentially contains all foreseeable actions as well as potential mitigations or management actions

This document has been compiled in support of the Mining Permit and Environmental Authorization Application and aims to assess any impacts associated with small scale mining. It is important that interested and Affected Parties are provided with an opportunity to review and comment on the assessment report, thereby contributing to the environmental impact assessment process and assisting in identifying any additional risks or impacts that may be experienced. As such, a public consultation was undertaken for this application and will be an on-going process until the DMRE concludes on the project. The draft report will be made available to Interested and Affected Parties for a period of at least 30 days to review and comment before the final submission.

1.1 Details of the Environmental Assessment Practitioner

Singo Consulting (Pty) Ltd was appointed by Ritchie Rich Enterprises (Pty) Ltd as an independent EAP to compile this report. The contact details of the consultants who compiled this report are as follows:

Table 1: Details of the EAP that prepared the Report

Name of the Practitioner	**Zwivhuya Tshabuse**
Designation	Environmental Technician
Tel No.	(013) 692 0041
Cell No.	+27 76 356 4443
Fax No.	+27 86 515 4103
Email	*zwivhuya@singoconsulting.co.za*

Table 2: Details of the First EAP who Reviewed the report

Name of the Practitioner	**R Shonisani**
Designation	EAP
Tel No.	(013) 692 0041
Cell No.	+27 7
Fax No.	+27 86 515 4103
Email	*rudzani@singoconsulting.co.za*

Table 3: Details of the Second EAP who reviewed the Report

Name of the Practitioner	**NK Singo**
Designation	Principal EAP
Tel No.	(013) 692 0041
Cell No.	+27 78 2727 839
Fax No.	+27 86 515 4103
Email	*Kenneth@singoconsulting.co.za*

1.2 Expertise of the EAP

1.2.1 Summary of EAP's Past Experience

Singo Consulting (Pty) Ltd is a private independent research, consultancy and advisory company based in Emalahleni (Witbank). It was established in 2008, since then this company is growing rapidly, and it is making itself known within the length and breadth of the Republic of South Africa. We take pride in the outstanding quality of our services driven by our core values which are due diligence, integrity, and honestly (independency).

1.2.2 Qualifications of the EAP

For carried out Environmental Impact Assessments: See attached CV.

1.3 Location of the Activity

The proposed mining permit application encompasses portion of the remaining extent of the Farm Klipspruit 138 HT constituting a total of 5 hectares. The area is located in close proximity of one of the Rural nodes/Settlements; within 18.69 km northeast of Dirkiesdorp, 5.04 km southeast of Ngema Tribal Trust, 10.26 km southeast of KwaNgema of the Mkhondo Local Municipality and 212.95 m south of a mining operation for the same applicant. The proposed project area is located along unnamed road which connects to R543, which links the Piet Retief and Dirkiesdorp Town. The tertiary road connecting to R543 to the project area is in good shape. The project area is mainly compromised of natural vegetation, Plantation and surrounded by few waterbodies and wetlands. During site assessment, sinkholes and diggings were found on site. According to the terrestrial biodiversity map produced by GIS specialist, it shows that the proposed area falls within Heavily Modified. Heavily modified are transferred areas, where biodiversity and ecological function have been lost to the point that they are not worth considering for conservation at all.

Table 4: Locality details

Farm Name	Portion of the remaining extent of the Farm Klipspruit 138 HT
Application Area (Ha)	Approximately 5 hectares (ha)
Magisterial District	Magisterial District of Mkhondo (Wakkerstroom)
Local Municipality	Mkhondo Local Municipality
Distance and direction from nearest town	Approximately 23.67 km West of Piet Retief along R543 towards Dirkiesdorp.
21-digit Surveyor General Code for each Portion	T0HT00000000013800000

Coordinates	ID X Y A;30.556371; -27.074637 B;30.558300; -27.074629 C;30.559096; -27.075375 D;30.558791; -27.076410 E;30.556380; -27.076396 A;30.556371; -27.074637
Locality map	See Figure 1 & 3 below

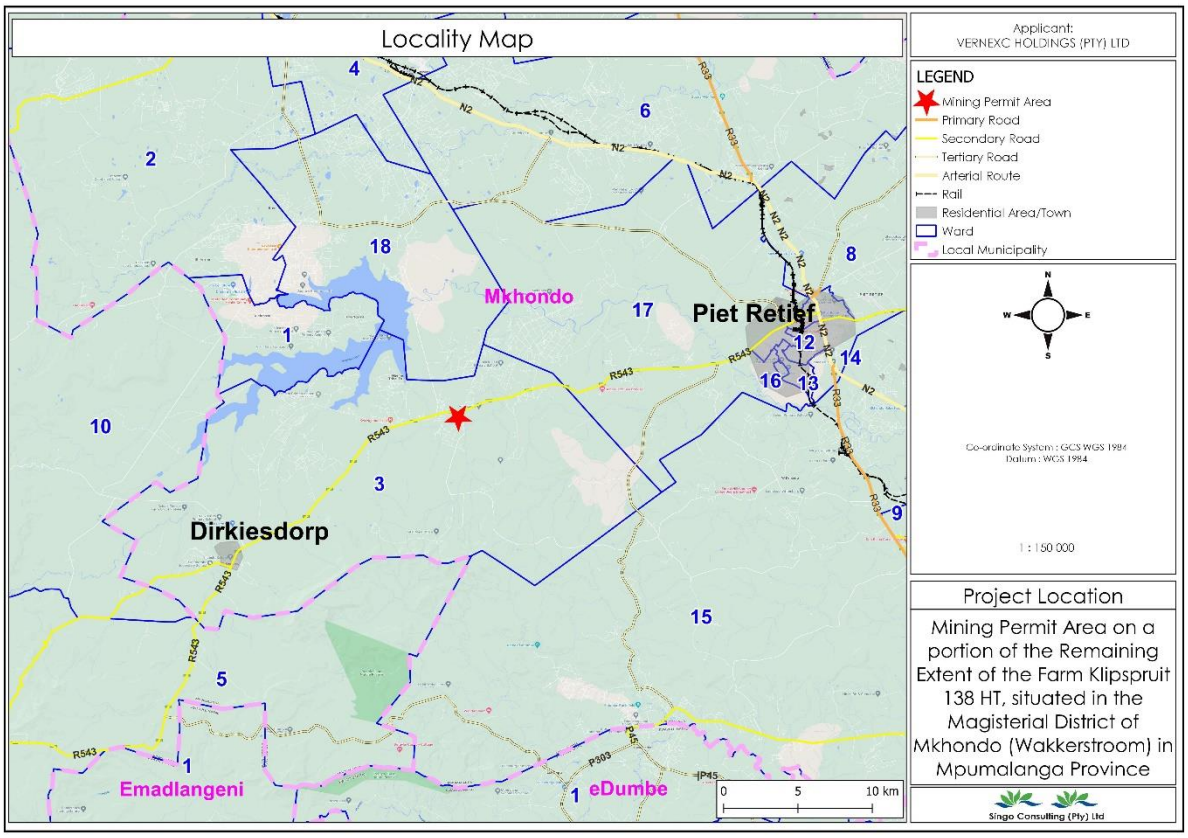


Figure 1: Locality map of the proposed project area (Singo Consulting GIS Team, 2022)

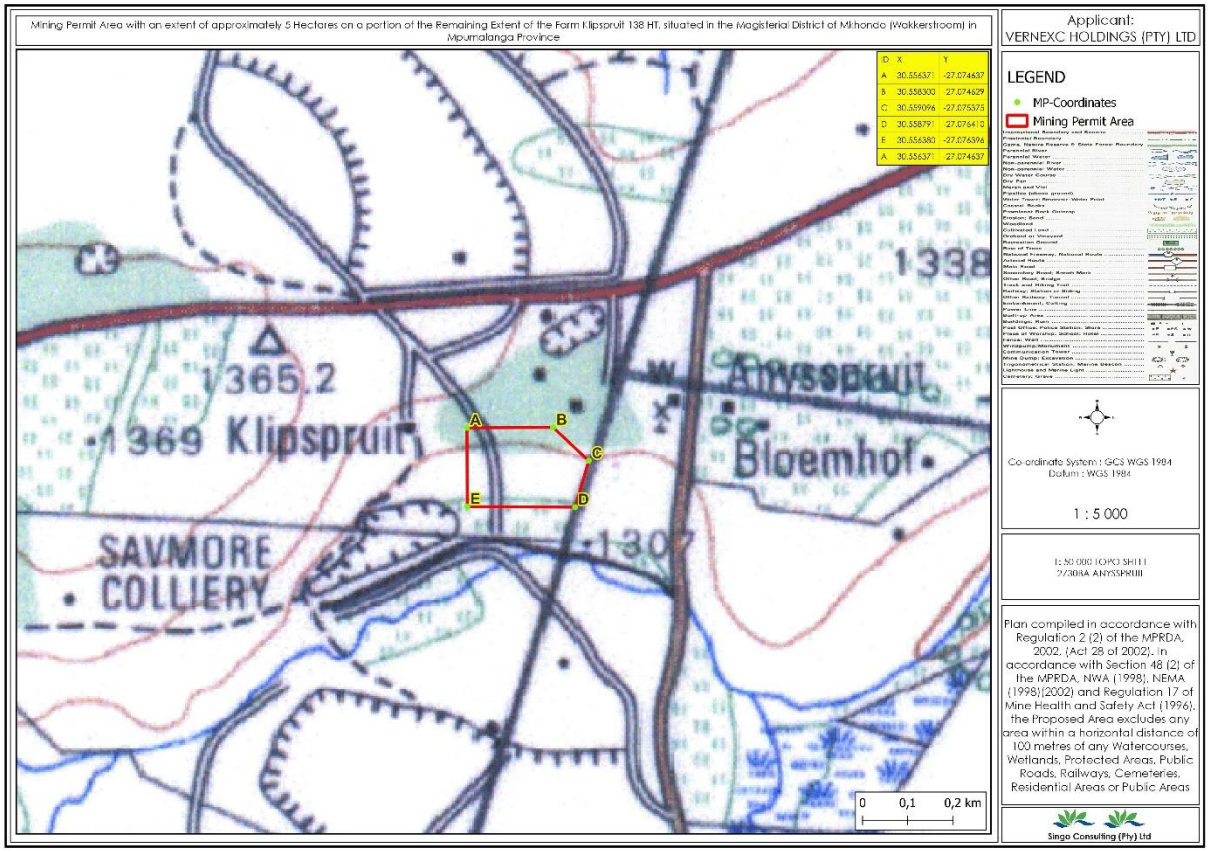


Figure 2: Reg 2.2 Map

Figure 3: Overview of the project area (Site Visit, 2022)

2 DESCRIPTION AND SCOPE OF THE PROPOSED ACTIVITY

The technology that will be adopted is a very simple sort of open cast mining, and a 5-ha area will be delimited for mining activities. Blasting and subsequent mining of the orebody utilizing a truck and shovel operation will be done (see Figure 4). The mined ore will be processed and screened in a mobile crushing and screening machine that will be established within the boundaries of the mining area. A front-end loader will be utilized to load the material into haulage trucks. The mine will operate for a two (2) year permit period with an option to renew for three (3) periods of which may not exceed five years. The coal will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the mining site.

The project infrastructure and activities will include the following:

- Site clearance.
- Removal of topsoil and overburden and stockpiling.
- Site establishment, including the establishment of an access route, mobilisation of equipment and preparation of area for mining.
- Excavation of an open pit.
- Blasting.
- Loading zone.

- Loading and dust control.
- Crushing and screening.
- Hauling and transporting of ore.
- Ablution facilities and waste storage area.
- Rehabilitation of site and Monitoring.

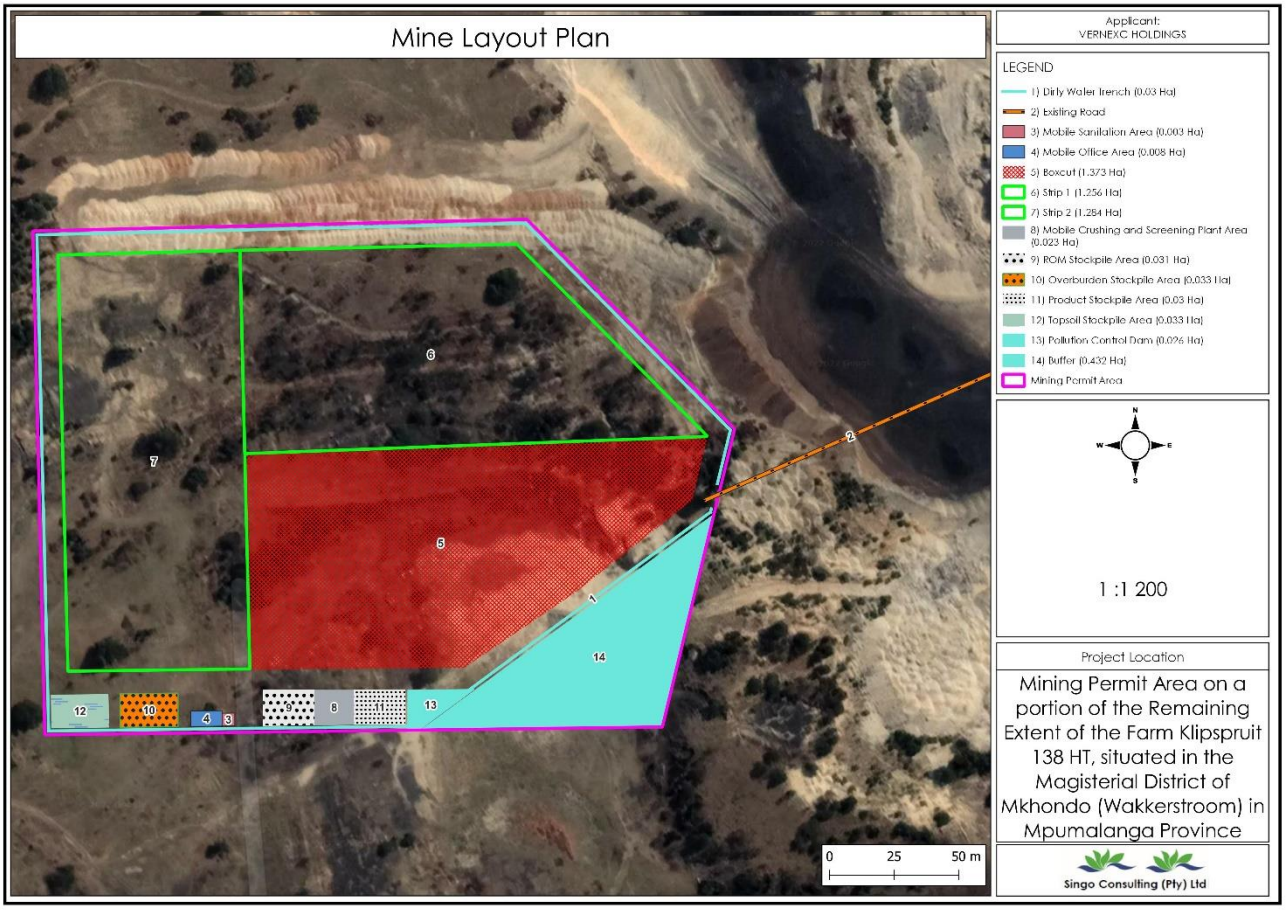


Figure 4: Proposed Mining Layout (Singo Consulting GIS Team, 2022)

2.1 Listed and Specified Activities

The legal requirement for Environmental Authorisation for a Mining Permit came into effect after the promulgation of the NEMA 2014 EIA Regulations on the 08th of December 2014. Prior to this, Mining Permits were subjected to the provisions of the MPRDA (2002). In this regard, a Mining Permit and Environmental Authorisation are required in terms of the MPRDA (2002) and NEMA 2014 EIA Regulations (as amended), respectively. The applicable NEMA listed activities anticipated to be triggered by this project are outlined in Table 5.

Table 5: Listed and specified activities.

NAME OF ACTIVITY E.g. for prospecting: drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office and access route; and for mining: excavations, blasting, stockpiles, discard dumps/ dams, loading, hauling, transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines and conveyors.	Aerial extent of the activity Ha or m²	Listed activity Mark with X where applicable	Applicable listing notice (GNR 517 of 11 June 2021)
Open cast mining and crushing to produce coal specs required by clients	5Ha	X	GN 517 Listing Notice 1 activity 21:
Vegetation Clearance	5 Ha	X	GNR 517 Listing Notice 1 activity 27:
Topsoil stockpile area	0.033Ha	X	Not listed
ROM stockpile area	0.031Ha	X	Not listed
Product Stockpile area	0.03Ha	X	Not listed
Overburden Stockpile area	0.033Ha	X	Not listed
Dirty water trench	0.03Ha	X	Not listed
Mobile offices	0.008Ha	X	Not listed
Mobile sanitation area	0.003Ha	X	Not listed
Pollution Control Dam (PCD) construction	0.026Ha	X	Not listed
Box cut construction	1.373Ha	X	Not listed
Strip 1	1.256Ha	X	Not listed
Strip 2	1.284Ha	X	Not listed
Mobile Crushing & screening plant	0.023Ha	X	Not listed
Rehabilitation	5 Ha	X	Not listed

2.2 Description of Activities to be Undertaken

This project will be carried out in terms of National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014 (as amended) read together with regulation 40-43 of the Act. The trigged activities as reflected on Government Notice R983 (as amended) Activity No. will be; LN 1 Activity 21 & 27:

- LN 1 Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for -(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
- Activity 21: The project requires a mining permit in terms of the MPRDA.

LN 1 Activity 27 is about clearing of vegetation and this application seek to be authorised for this activity. Deforestation process is required before commencement of any mining activity if the area is vegetated, this process allows the mining company to gain access to the mining area and locating other required infrastructures. Therefore, land clearance will be the first stage as part of development.

During site establishment, the applicant must demarcate the site boundaries and clear the topsoil and overburden from the extension area to open it for drilling and blasting. Upon stripping, the topsoil and overburden will be stockpiled along the boundaries of the opencast mining for use during the rehabilitation phase. Topsoil stripping will be restricted to the areas to be mined. The complete A-horizon (topsoil – the top 100-200 mm of soil, which is generally darker in colour due to high organic matter content) will be removed. If it is unclear where the topsoil layer ends, the top 300 mm of soil must be stripped.

The topsoil will be stockpiled in the form of a berm alongside the boundary of the mine mining where it will not be driven over, contaminated, flooded or moved during the operational phase. The topsoil berm will measure a maximum of 1.5 m high and indigenous grass species must be planted on it, if vegetation does not naturally establish within 6 months of stockpiling, to prevent soil erosion and discourage weed growth. The roots of the grass will improve soil viability for rehabilitation purposes. The stripped overburden will be stockpiled on a designated area after the topsoil has been removed. The applicant will introduce the mining equipment to the area during the site establishment phase.

2.3 Development -Stripping of overburden

Overburden is waste rock consisting of consolidated and unconsolidated material that must be removed to expose the underlying ore body. It is desirable to remove as little overburden as possible in order to access the ore of interest, but a larger volume of waste rock is excavated when the mineral deposit is deep. The removal techniques that will be employed are cyclical with interruption in the extraction (drilling, blasting and loading) and removal (haulage) phases. This is particularly true for hard rock overburden which must be drilled and blasted first. An exception to this cyclical effect is, dredges used in hydraulic surface mining and some types of loose material mining with bucket wheel excavators. The fraction of waste rock to ore excavated is defined as the stripping ratio. Stripping ratios of 2:1 up to 4:1 is not uncommon in large mining operations. Ratios above 6:1 tend to be less economically viable, depending on the commodity. Once removed, overburden can be used for road and tailings construction or may have non-mining commercial value as fill dirt.

In a surface mine, the ore is located close to the surface and can be recovered by scraping away the top layers of rock and dirt. Nearly all surface mining operations are outdoors and don't need any roof support. To extract minerals, open cast mining uses a traditional mining cycle of operations. Rock breakage is typically accomplished by drilling and blasting for consolidated materials and by ripping or direct removal by excavators for unconsolidated soil and/or decomposed rock, then materials handling and transportation. Based on geological information, resource extrapolation from neighbouring mines, the duration of a permit, and the closure benefit of open cast mining, this technique of mining was taken into consideration.

During the development and exploitation stages of mining when natural materials are extracted from the earth, remarkably similar unit operations are normally employed. The unit operations of mining are the basic steps used to produce mineral from the deposit, and the auxiliary operations that are used to support them. The steps contributing directly to mineral extraction are production operations, which constitute the production cycle of operations. The ancillary steps that support the production cycle are termed auxiliary operations. The production cycle employs unit operations that are normally grouped into rock breakage and materials handling. This cyclic operation will be employed to recover coal resources.

Breakage generally consists of drilling and blasting, and materials handling encompasses loading or excavation and haulage (horizontal transport) and sometimes hoisting (vertical or inclined transport). Thus, the basic production cycle consists of these unit operations:

$$\text{Production cycle} = \text{Drill} + \text{Blast} + \text{Load} + \text{Haul}$$

Although production operations tend to be separate and cyclic in nature, the trend in modern mining and tunnelling is to eliminate or combine functions and to increase continuity of extraction. For example, in coal and other soft rock mines, continuous miners break and load the mineral to eliminate drilling and blasting; boring machines perform the same tasks in medium-hard rock. The cycle of operations in surface and underground mining differs primarily by the scale of the equipment. Specialized machines have evolved to meet the unique needs of the two regimes.

2.3.1 Blasting Operation

Drilling and blasting can be defined as the controlled use of explosives and other methods such as gas pressure blasting pyrotechnics, to break rock for excavation. It is practiced most often in mining, quarrying and civil engineering such as dam, tunnel or road construction. The result of rock blasting is often known as a rock cut.

Drilling and blasting currently utilizes many different varieties of explosives with different compositions and performance properties. Higher velocity explosives are used for relatively hard rock to shatter and break the rock, while low velocity explosives are used in soft rocks to generate more gas pressure and a greater heaving

effect. For instance, an early 20th-century blasting manual compared the effects of black powder to that of a wedge, and dynamite to that of a hammer. The most used explosives in mining today are ANFO based blends due to lower cost than dynamite. This method will only be used for hard rock, ripping is a preferred mining method.

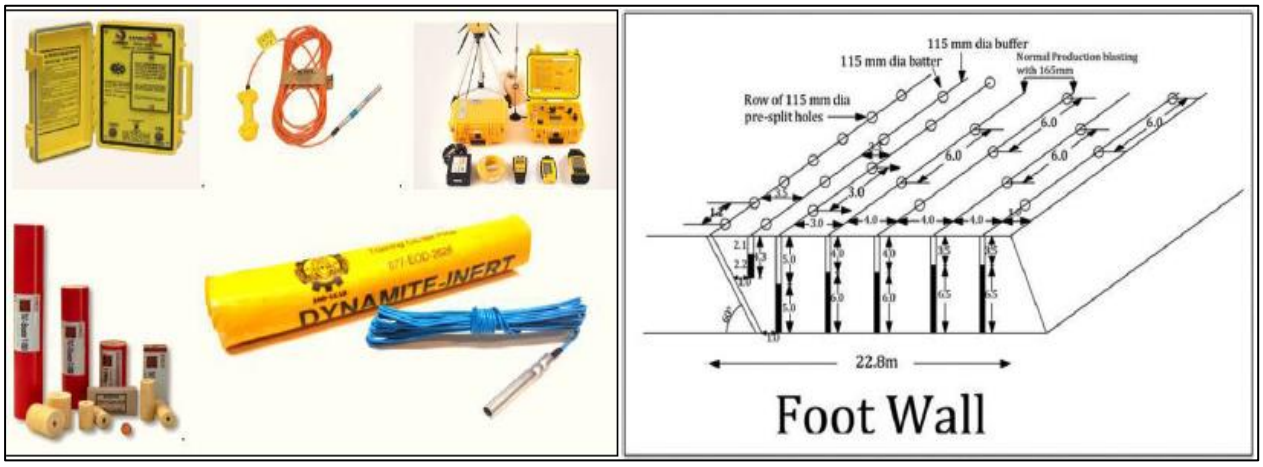


Figure 5: Accessories, Blasting Design, and Planning for Blasting

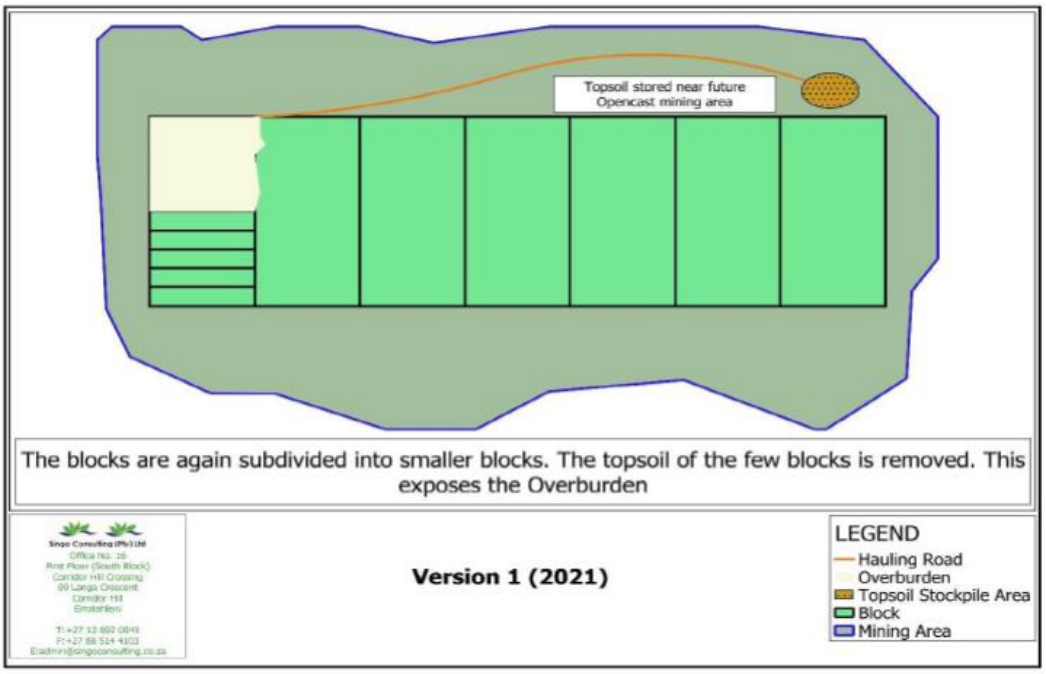


Figure 6: Topsoil removal

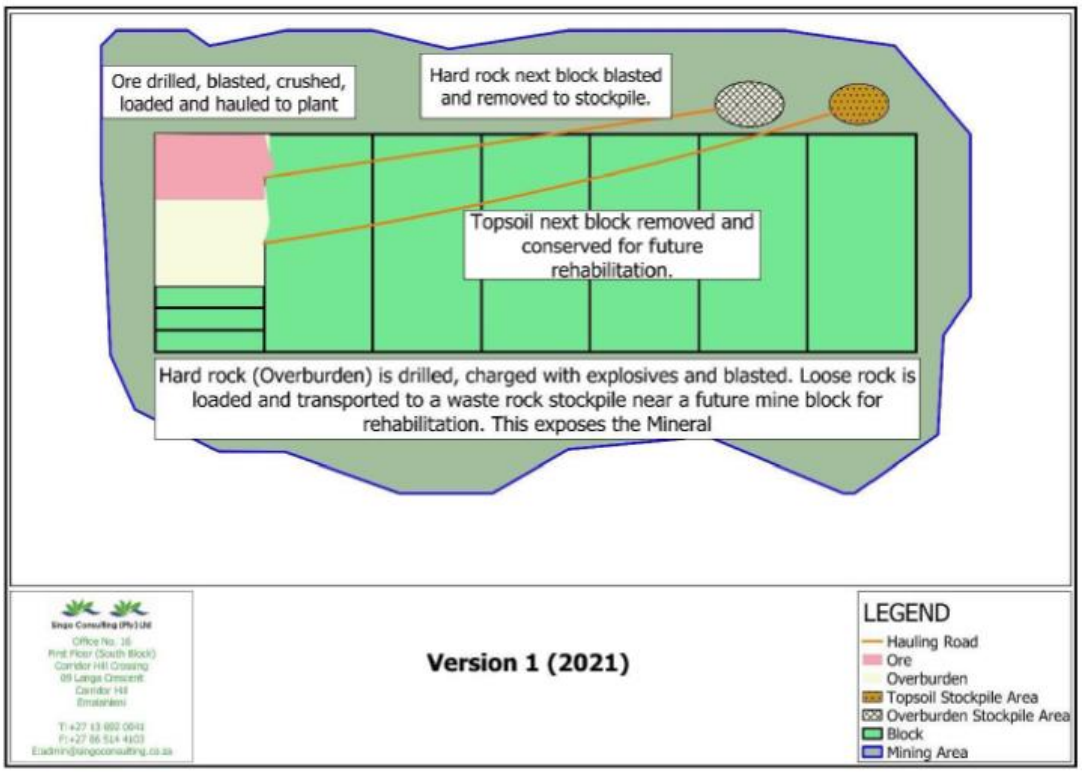


Figure 7: Overburden blasting and removal

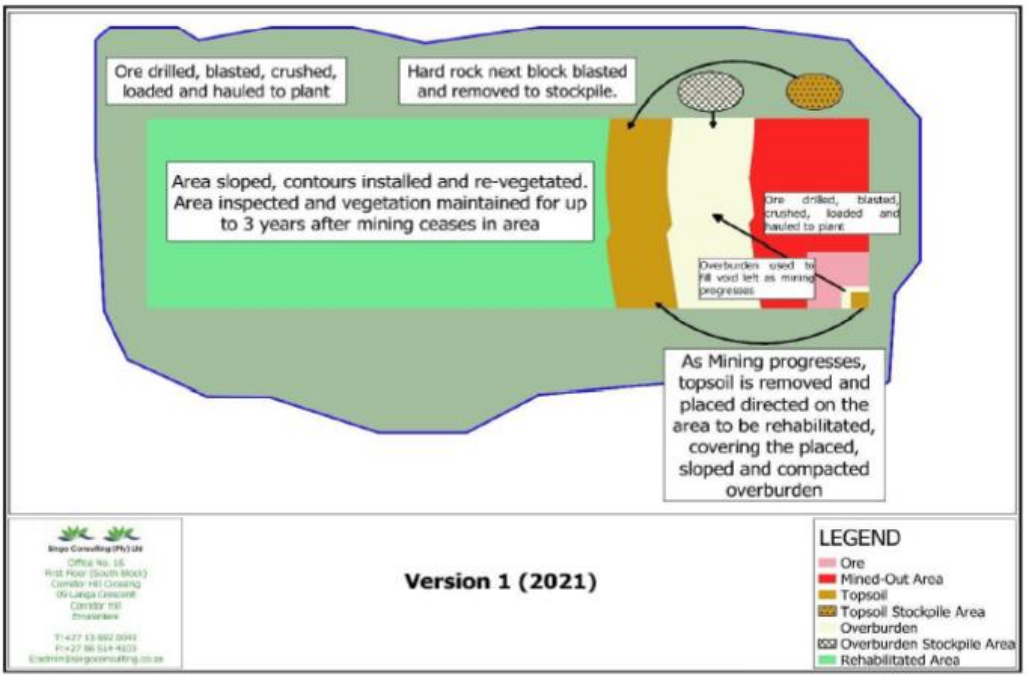


Figure 8: Backfilling and rehabilitation stage

Phase	Activity no	Activity
Construction	1	Site clearing: Removal of topsoil and vegetation
	2	Construction of any surface infrastructure, e.g. Haul roads, pipes, storm water diversion berms (incl. transportation of materials and stockpiling)

	3	Blasting and development of initial box cut for mining
	4	Temporary storage of hazardous products (fuel, explosives) and waste
Operation	5	Removal of overburden and backfilling when possible (incl. drilling/blasting of hard overburden and stockpiling)
	6	Use and maintenance of haul roads.
	7	Extraction of coal (mining process) and run of mine (RoM) coal stockpile
	8	Water use and storage on site
	9	Storage, handling and treatment of hazardous products (fuel, explosives, oil) and waste activities (waste, discard)
	10	Concurrent replacement of overburden, topsoil and re-vegetation
Decommissioning	11	Removal of all infrastructure (incl. transportation off site)
	12	Rehabilitation (spreading of soil, re-vegetation and profiling)
	13	Installation of post-closure water infrastructure
	14	Environmental monitoring of decommissioning activities
	15	Storage, handling and treatment of hazardous products (fuel, explosives, oil) and waste activities (waste discard)
Post-closure	16	Post-closure monitoring and rehabilitation

3 POLICY AND LEGISLATIVE CONTEXT

This Mining Permit application requires Authorisation in terms of the following interlinked pieces of legislation:

- The Mineral and Petroleum Resources Development Act, 2002 (MPRDA, Act 28 of 2002), as amended.
- The National Environmental Management Act, 1998 (NEMA, Act 107 of 1998), as amended.

These pieces of core legislation stipulate the required studies, reports and legal processes to be conducted and the results thereof are to be submitted to the relevant authorities for approval prior to commencement. In addition to the above, there are various pieces of legislation which govern certain aspects of the mining operations and these are summarized in Table 5, together with the main legislative requirements mentioned above.

Table 6: Policy and Legislative Context

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
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.		E.g. In terms of the National Water Act (NWA)a Water Use License will be applied for.
Minerals and Petroleum Development Resources Act, Act 28 of 2002 (MPRDA) and the MPRDA Amendment Act, Act 49 of 2008	DMRE	The conditions and requirements attached to the granting of the mining permit will apply to the mining activities.
Constitution of South Africa, specifically everyone has the right to: • an environment that is not harmful to their health or wellbeing • have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development	Republic of South Africa	The mining activities will only proceed after effective consultation.

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
Environmental Impact Assessment (EIA) regulations	DMRE	This Basic Assessment Report (BAR) is being undertaken in terms of the EIA. Regulations are in place to determine any possible impacts on the environment and propose sufficient mitigation to prevent environmental damage.
National Environmental Management Act, Act 107 of 1998 (as amended) (NEMA)	DMRE	This BAR is being undertaken in terms of the NEMA (No. 107 of 1998), as amended, to determine environmental impact and propose sufficient mitigation to prevent environmental damage. The appropriate environmental authorisation will be obtained before proceeding with any mining activities. No mining activity will be conducted in a sensitive environment. Measures will be implemented to prevent pollution during mining activities. Once mining is complete, the area will be rehabilitated as close as reasonably possible to its pre-mining state.
National Water Act, 1998 (Act 36 of 1998). Best Practice Guidelines: Series A, G, & H	(S 21) Water use & mine water management	Best practice guidelines will be followed for water management, water characterisation, water resource protection, water treatment, and the development of the mine water management model

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
National Environmental Management: Waste Act, Act 59 of 2008 (NEMWA)NEM: WA	Management measures Environmental awareness plan	All type of waste will be managed as prescribed by the regulation (NEMWA)
National Heritage Resources Act, 25 of 1999 (NHRA)	Management measures	Phase 1 Archaeological and Heritage Impact Assessment has been conducted and recommendations made will be adhered to.
Municipality By-Laws: Waste Management by-law Act 59 of 2008, Air Quality Management By-law Act No 39 of 2008, Noise control by-law, Spatial Planning and Land Use Management act no 16 of 2013 (SPLUMA).	Environmental Management measures awareness plan	Best practice guidelines will be followed for any by-law's management and the development of the mine environmental and other legislative management.

3.1 Listed activities triggered/Other relevant legislation.

Activity	Mining permit area (5 ha)	Activity 21: Listing Notice 1
Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the MPRDA 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of mineral resource, including activities for which an exemption has been issued in terms of section 106 of the MPRDA (2002).		E.g., In terms of the NWA, a Water Use License has/has not been applied for

Activity	Mining permit area (5 ha)	Activity 21: Listing Notice 1
The clearance of an area of 1 ha or more, but less than 20 ha, of indigenous vegetation, except where such clearance of indigenous vegetation is required for: (i) The undertaking of a linear activity. (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.	Mining permit area (5 ha)	Activity 27: Listing Notice 1
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Mining activities	The potential impact on important CBAs conservation in the study area, and the management thereof is addressed in this BAR & EMPr.
Mkhondo Local Municipality (2017- 2022 Final Integrated Development Plan)	Needs, desirability, socio-economic needs	Incorporated under section 4 and 9.1
Gert Sibande District Municipality Spatial Development Framework	Land Use	The applicant acknowledges the need to maximize economic benefit from mining, industrial, business, agricultural and tourism development in the area and promote a climate for economic development in line with the municipal development frameworks
National Environmental Management Air Quality Act (Act No 39 of 2008), National Ambient Air Quality (GN 1210: 2009) Mine Health and Safety Act, Act 29 of 1996 National Dust Control Regulations (GN 827: 2013 as amended)	Air quality & dust control	Standards for particulates and dust used in the Impact Assessment will regulate the concentration of a substance that can be tolerated without environmental deterioration. Exposure to dust and toxic particles (i.e. coal dust) will be managed.

Activity	Mining permit area (5 ha)	Activity 21: Listing Notice 1
ISO 14001:2015: Principle of Sustainable development	Environmental management system	Development of an integrated environmental management system and measures for responding to environmental conditions (PDCA model).

3.2 Environmental Authorization Process

3.2.1 Mineral and Petroleum Development Act

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002), a Mining Permit must be issued prior to the commencement of any mining activities. As per Section 79(4)(a) and (b) of the MPRDA, the Applicant is required to conduct a Basic Assessment and submit an EMPR for approval as well as to notify in writing and consult with Interested and Affected Parties (I&APs) within 90 days of acceptance of the application. The MPRDA also requires adherence with related legislation, chief amongst them is the National Environmental Management Act (Act 107 of 1998, NEMA) and the National Water Act (Act 36 of 1998, NWA).

Several amendments have been made to the MPRDA. These include, but are not limited to, the amendment of Section 102, concerning amendment of rights, permits, programmes and plans, to requiring the written permission of the Minister for any amendment or alteration; and the Section 5A(c) requirement that landowners or land occupiers receive twenty-one (21) days' written notice prior to any activities taking place on their properties. One of the most recent amendments requires all mining related activities to follow the full NEMA process as per the 2014 EIA Regulations (as amended), which came into effect on 08th of December 2014.

A Mining Permit is exclusive, transferable, valid for two (2) years and may be renewed for three periods of which may not exceed one year.

3.2.2 National Environmental Management Act

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA Environmental Impact Assessment (EIA) regulations, the proponent is required to appoint an environmental assessment practitioner (EAP) to undertake the EIA 9 as well as the public participation process. In South Africa, EIA became a legal requirement in 1997 with the promulgation of regulations under the Environmental Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to

identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant environmental authorisation. On 21 April 2006, the Minister of Environmental Affairs and Tourism promulgated regulations in terms of Chapter 5 of the NEMA.

The objective of the Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the activities that have been identified. The purpose of these procedures is to provide the competent authority with adequate information to make decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorized, and that activities which are authorized are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

The aim of the EIA process is to identify and assess the potential impacts associated with the proposed project and to develop measures through which potential negative biophysical and socio-economic impacts can be mitigated and positive benefits can be enhanced. The EIA will ensure that all issues are integrated into the lifecycle of the mining operation and its infrastructure. This will occur during the planning, construction, operation and decommissioning and site closure phases.

The Basic Assessment Report and the associated EMPR will indicate how the identified impacts will be avoided, mitigated and/or managed by setting environmental objectives and goals. The EMPR will further outline the implementation programme for the environmental objectives and goals. The EMPR is a legal requirement of the MPRDA and all mines, existing or new, are required to possess an approved EMPR prior to initiating any mining operations. The EMPR is legally binding, and the proponent is required to meet the requirements specified in the document.

The written decision called an Environmental Authorisation, is a legal document setting out the conditions of the Authorisation and the actions required to protect human health and the environment. Any affected party may appeal against the decision contained in an Environmental Authorisation. Appeals must be lodged with the Minister who considers appeals in terms of the relevant provisions of NEMA and the Environmental Regulations.

An important amendment to the NEMA (December 2014) Regulations is that the Department of Mineral Resources has been the responsible authority for approving and issuing of Environmental Authorisations under the NEMA for mining related activities. The Department of Environmental Affairs is the appeal authority for mining related Environmental Authorisations.

3.2.3 National Environmental Management: Waste Amendment Act

The Regulations pertaining to the NEMWA activities were published on 3rd July 2009 in Government Gazette 32368 under GN 718. These were amended in August 2013 in Government Notice Regulation 921. Regulations regarding the planning and management of residue stockpiles and residue deposits were published and commenced on 24 July 2015 in Government Notice Regulation 632 and the List of waste

management activities that have or are likely to have a detrimental effect on the environment were amended on the same date by Government Notice Regulation 921. As per this list the following is of important to note:

Category A: (15) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining permit or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
Category B: (11) 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).

On the 2nd of June 2014 the National Environmental Management: Waste Amendment Act came into force. Of importance for mining activities is that according to this amendment, waste resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals is classified as Hazardous Waste. Waste is accordingly no longer governed by the MPRDA but is subject to all the provisions of the National Environmental Management: Waste Act, 2008 (NEMWA). Section 16 of the NEMWA must also be considered which states as follows:

"A holder of waste must, within the holders power, take all reasonable measures to:

- Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated.
- Reduce, re-use, recycle and recover waste.
- Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner.
- Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odours, or visual impacts.
- Prevent any employee or any person under his or her supervision from contravening the Act.
- Prevent the waste from being used for unauthorized purposes.

These general principles of responsible waste management are incorporated into the requirements in the EMPR to be implemented for this project.

Schedule 3: Defined Wastes have been broken down into two categories: Category A being hazardous wastes and category B being general wastes. Under Category A (hazardous wastes) the act makes allowance for "wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals".

In order to attempt to understand the implications of this it is important to ensure that the definitions of all the relevant terminologies are defined:

- Hazardous waste: means "any waste that contains organic or inorganic elements or compounds that may, owning to the inherent physical, chemical or toxicological characteristic of that waste,

have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.

- Residue deposits: means "any residue stockpile remaining at the termination, cancellation or expiry of a prospecting right, mining right, mining permit, exploration right or production right.
- Residue stockpile: means "any debris, discard, tailings, slimes, screening, slurry, waste rock, foundry sand, mineral processing plant waste, ash or any other product derived from or incidental to a mining operation and which is stockpiled, stored or accumulated within the mining area for potential re-use, or which is disposed of, by the holder of a mining right, mining permit or, production right or an old order right, including historic mines and dumps created before the implementation of this Act.

Various regulations have been drafted in support of the NEMWA, as discussed below:

- Proposed Regulations regarding the planning and management of waste from a prospecting, mining, exploration or production operations (2014):
- Chapter 2, Section 3 states the identification and assessment of any environmental impacts, including those on groundwater, arising from waste must be done as part of the Environmental Impact Assessment (EIA) conducted in terms of the National Environmental Management Act, 1998 (Act No.107 of 1998) (hereafter referred to as the NEMA). The pollution control barrier system shall be defined by the (a) Waste Classification and Management Regulations (2013);(b) National Norms and Standards for the Assessment of Wastes for Landfill Disposal (2013); and (c) National Norms and Standards for Disposal of Waste to Landfill (2013).
- Waste Characterization must be done in terms of physical and chemical composition as well as content. The classification must be done in terms of the health and safety classification and the environmental classification.

Proposed Regulations to exclude a waste stream or a portion of a waste stream from the definition of a waste (2014):

This regulation will give the holder of the right the opportunity to exclude a waste stream, or a portion of a waste stream from the definition of a waste. Chapter 2, Section 4 of this Regulation, Sub-section (1) states that any portion of a waste generated from a source listed in Category A of Schedule 2 of the NEMWA, may be excluded from being defined as hazardous on demonstration that such portion of waste in non-hazardous in accordance with the Waste Management and Classification Regulations of 2013. The application process will be in the form of a prescribed process and application must be made to the Minister. This Regulation is however not yet in force. National Norms and Standards for the assessment of waste for landfill disposal (23 August 2013): These norms and standards prescribe the requirements for the assessment of waste prior to disposal to landfill. The aim of the waste classification tests is to characterise the material to be deposited or stored in terms of the above-mentioned waste classification guidelines set by the Department of Environmental Affairs (DEA).

The outcomes of the tests provide the necessary information in terms of:

- Identification of chemical substances present in the waste.
- Determination of the total concentrations (TC) and leachable concentrations (LC) of the elements and chemical substances that have been identified in the waste and that are specified in Section 6 of the above-mentioned Regulations. The obtained TC and LC values of the waste material will be compared to the threshold limits for total concentrations (TCT limits) and leachable concentrations (LCT limits) specified in Section 6 of the above-mentioned Regulations. Based on the TC and LC values of the elements and chemical substances in the waste exceeding the corresponding TCT and LCT limits respectively, the specific type of waste for disposal to landfill will be determined in terms of Section 7 of the Regulations.

3.2.4 The National Environmental Management: Biodiversity Act

The National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004, NEMBA), "provides for: the management and conservation of South Africa's biodiversity within the framework of the NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute (SANBI); and for matters conducted therewith".

In terms of the Biodiversity Act, the applicant has a responsibility for: The conservation of endangered ecosystems and restriction of activities according to categorization of the area (not just by listed activity as specified in the EIA regulations):Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.

Limit further loss of biodiversity and conserve endangered ecosystems

Regulations published under the NEMBA also provide a list of protected species, according to the Act (GNR 151 dated 23 February 2007, as amended in GNR 1187 dated 14 December 2007). Section 57 of NEMBA identifies restricted activities involving threatened or protected species. Restricted activities include the gathering, collecting, cutting, uprooting, damaging or destroy a listed species.

3.2.5 The National Environmental Management: Protected Areas Act

The National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) (NEMPAA) serves to: "provide for the protection and conservation of ecologically viable areas representative of South Africa's biological biodiversity and its natural landscapes and seascape; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with

national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; for the continued existence, governance and functions of South African National Parks; and for matters in connection therewith.

The objectives of this Act are –

- To provide, within the framework of the national legislation, including the National Environmental Management Act, for the declaration and management of protected areas.
- To provide for co-operation governance in the declaration and management of protected areas.
- To affect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity.
- To provide for a diverse and representative network of protected areas on state land, private land, communal land and marine water.
- To promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas.
- To promote participation of local communities in the management of protected areas, when appropriate
- To provide for the continued existence of South African National Parks.

3.2.6 National Water Act

The National Water Act, 1998 (Act 36 of 1998) (NWA) makes provision for two types of application for water use licenses, namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the Applicant of the likely effect of the proposed license on the resource quality, and that such assessment be subject to the EIA regulations. A person may use water if the use is-

- Permissible as a continuation of an existing lawful water use (ELWU).
- Permissible in terms of a general Authorisation (GA).
- Permissible under Schedule 1.
- Authorised by a licensed.

The NWA defines 11 water uses. A water use may only be undertaken if authorised. Water users are required to register certain water uses that actually took place on the date of registration, irrespective of whether the use was lawful or not.

Section 21 of the National Water Act 1998 lists the following 11 water uses which can only be legally undertaken through the water use Authorisation issued by the Department of Water and Sanitation (DWS):

(a) Taking water from a water resource.
(b) Storing water.
(c) Impeding or diverting the flow of water in a watercourse.
(d) Engaging in a stream flow reduction activity contemplated in Section 36.
(e) Engaging in a controlled activity identified as such in Section 37(1) or declared under Section 38(1).

(f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits.

(g) Disposing of waste in a manner which may detrimentally impact on a water resource.

(h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.

(i) Altering the bed, banks, course or characteristics of a watercourse.

(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.

(k) Using water for recreational purposes.

No Water Use License has been applied for this project. DWS was engaged about this project so they can direct us whether it is viable or not to apply for water use license.

3.2.7 National Heritage Resources Act

The National Heritage Resources Act, 1999 (NHRA) stipulates that cultural heritage resources may not be disturbed without Authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…" The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of CRM those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through NEMA, MPRDA and the DFA legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impacts processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage (Fourie, 2008b).

The NEMA 23(2)(b) states that an integrated environmental management plan should, "…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage". A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down in Section 33 (Fourie, 2008b).

MPRDA defines 'environment' as it is in the NEMA and therefore acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the National Heritage

Resources Act that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities (Fourie, 2008b).

The NHRA identifies 5 activities that require a Heritage Impact Assessment (HIA). An HIA is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment (AIA) only looks at archaeological resources.

An HIA must be done under the following circumstances:

(a) The construction of a linear development (road, wall, power line, canal etc.) exceeding 300 m in length.

(b) The construction of a bridge or similar structure exceeding 50 m in length.

(c) Any development or other activity that will change the character of a site and exceed 5 000 m2 or involve three or more existing erven or subdivisions thereof.

(d) Re-zoning of a site exceeding 10 000 m2.

(e) Any other category provided for in the regulations of SAHRA or a provincial heritage authority.

4. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

According to the IDP (2017 – 2022), mining contributes at least 11.9 % to the GVA of the municipality. The establishments of coal mines within the Municipality are steadily increasing. There are operational mines within the 20 km radius from the project area namely, Kiepersol Mine, Jindal Mining SA (Pty) Ltd, mining permit for coal by Vernex holdings (Pty) Ltd and Kangra Coal Mine and a recently granted coal mining permit on the adjacent property (Grootlaagte 70 HT) by Foloyi Construction and Projects CC. Kangra Coal (Pty) Ltd was mining coal underground in the area in the late 1990s, according to local knowledge, before abruptly ceasing operations. The environmental specialist at Kangra Coal (Pty) Ltd confirmed this information and also refer to figure10 for the project area in 2003. The mine had significantly contributed to employment opportunities and when it ceased their operations, many jobs were lost both directly at the mine and indirectly in terms of local contractors and businesses providing goods and services to the operation as well as the people dependent on those working for Kangra Coal. The proposed project is a key factor from a strategic point of view as Kangra Coal (Pty) Ltd mined underground previously, hence Vernex Holdings (Pty) Ltd intends to mine through opencast targeting the pillars that remain.

Figure 9: Project area in 2003 (Source, Google earth)

Figure 10: Diggins observed during site assessment

Socio-economic information of the Mkhondo Local Municipality provides an understanding of the need for economic development which is to further create employment opportunities. The individuals most affected by the proposed project are those who live in the Mkhondo Local Municipality's rural nodes, which include Driefontein, Dirkiesdorp, and KwaNgema. Despite the presence of economic activities such as small-scale agricultural activities (crop and livestock farming) on adjacent lands, the majority of residents in the aforementioned villages remain unemployed and disadvantaged.

This proposed Project will supply coal to the local markets, thereby assisting with the alleviation of the shortage of supply given that the project location is in a rural area. The National Development Framework

includes, in summary, the need to produce energy to support industry at competitive prices. Furthermore, the proposed Project will contribute to the local economy through job creation and procurement. Increased employment will lead to increased expenditure, tax base and royalties.

The Applicant must firstly employ people from the affected wards. The Applicant will also provide skills development to employees thereby advancing the future employability of these individuals. The project further identifies community development projects from which the surrounding communities will benefit as a result of this project. As stated in the MPRDA, the Government's objective is to maximise the benefit of the nation's mineral resources for the benefit of all South Africans. By establishing a new mining operation, this objective can be accomplished, particularly through job creation. From an environmental perspective, the Applicant is willing to pursue open cast mining on a shallow coal reserve in an effort to reduce the environmental impacts.

From the environmental Impact Assessment, it was found that the proposed area is not utilized for any activity, and it is believed that there is coal resource that should be exploited economically. Land capability refers the potential of land to support different land uses, and is determined by the physical, chemical and biological properties of the soils. In nature these qualities develop over millennia and are dependent on the type of underlying parent rock, the geographic locality, and climate. On rehabilitated land, the desired land capability is reinstated by re-creating the key fundamentals of what defines land capability (e.g., soil type, soil depth, soil texture, soil density, soil chemistry, topographic slope, and soil microbiology). Upon Rehabilitation, the land will be transformed to arable land for which the agricultural activities taking place adjacent of the area can be extended towards the mined area.

4 MOTIVATION FOR THE OVERALL PREFERRED DEVELOPMENT FOOTPRINT

The geology is the primary driver in determining the location for mining. After due consideration and conducting background and desktop studies, it was found that the coalfield lithology essentially comprises sediments of the Dwyka and Vryheid Formations of the coal-bearing Ecca Group, Karoo Supergroup, with dolerite intrusions thus providing the ideal geological formation for the presence of the mineral applied for (see figure 12 for the project geology).

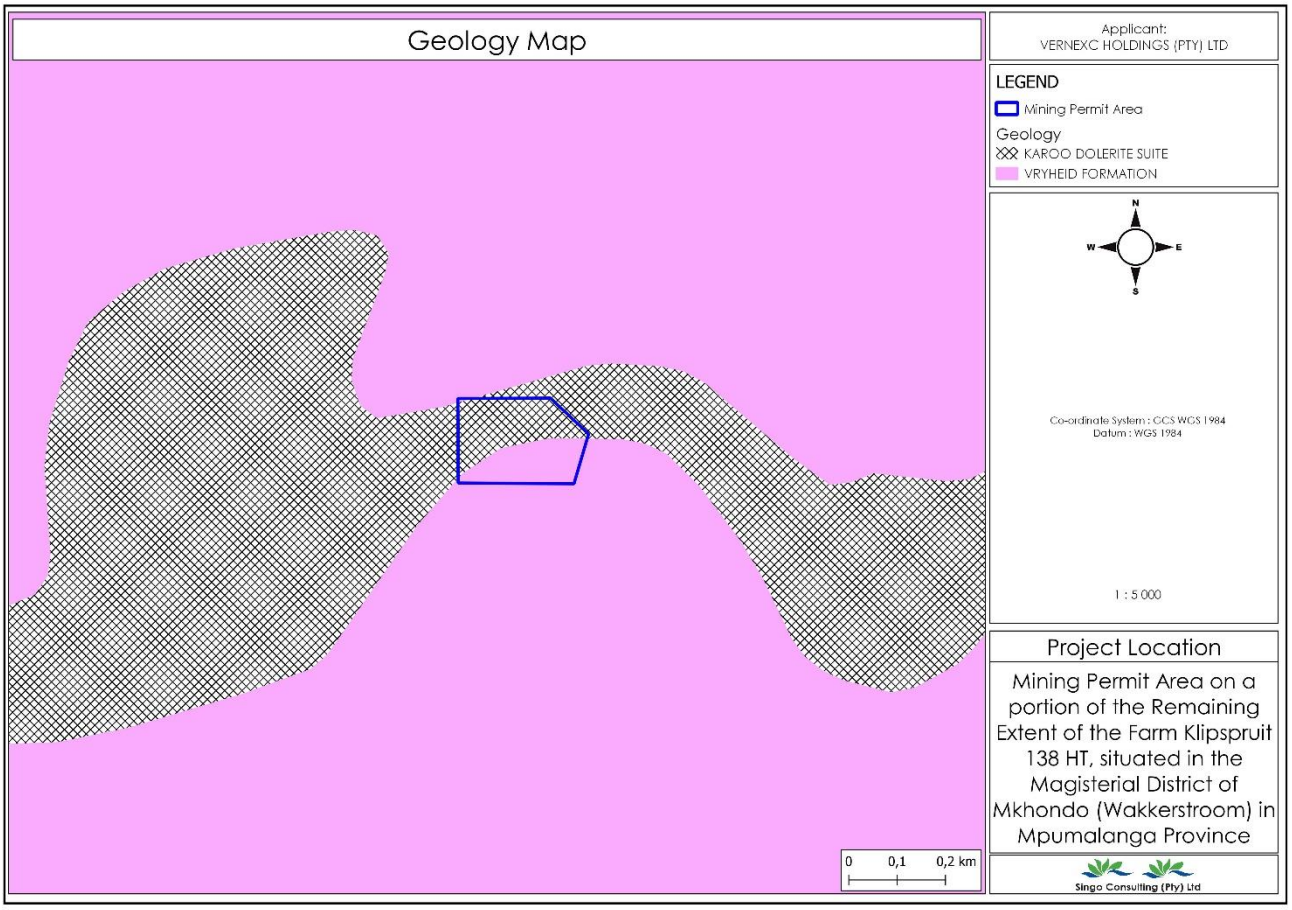


Figure 11: Geology map of the proposed project area (Singo Consulting GIS Team, 2022)

Singo Consulting personnel took it upon themselves to request and acquire data from the Council of Geoscience (GCS). The project area has been encroached upon by prior drilling operations, thus it isn't in perfect condition. Vernex Holdings (Pty) Ltd would wish to be given the opportunity to explore the remaining coal resources left by Kangra's Mpisi underground operations, based on the data gathered. Refer to figure 13) for the historic borehole map.

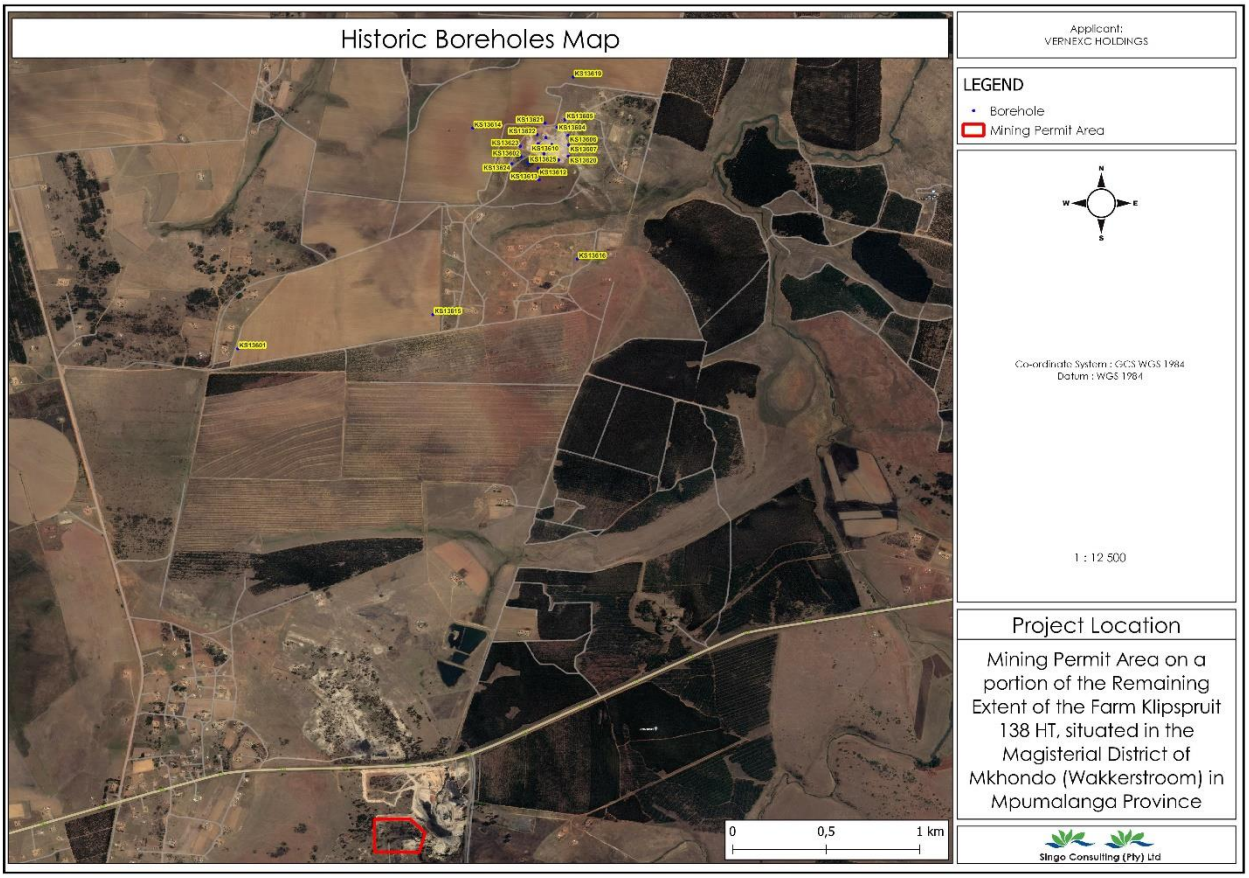


Figure 12: Historic Borehole Map

5 FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES WITHIN THE SITE

5.1 Details of Development Footprint Alternatives

The development footprint is 5 ha, which is the maximum legislated aerial extent that may be approved for a Mining Permit application in terms of the MPRDA, 2002 (as amended). The geology is the primary driver in determining the location for mining. As such, no assessment of alternative development scenarios was conducted.

5.1.1 Preferred Site

The application area has been selected based on historical and active coal mining operations in the surroundings of the application area along with historical and current data that indicate the economic viability of the Coal mineral to occur.

5.1.2 Type of Activity

The proposed activity is mining. The geology is the primary driver in determining the location for mining. As such, no activity alternative was considered.

8.1.1 The technology to be used in the activity

The opencast mining method will be considered to maximize the coal extraction and use of the coal resource from the area. Truck and shovel operations will be used. A front-end loader will be utilized to load material into haulage trucks that will be used for the hauling of the coal through haul roads that will be constructed in the demarcated Mining Permit area. The coal mined will be crushed and screened utilizing a mobile crushing and screening plant. The mined coal will be processed off-site. These mining methods are standard practice for opencast mining operations as stipulated above. Should the mining activities change, the applicant will be advised to apply for Section 102 of the MPRDA for amendments.

- Types of Blasting Explosives to be Employed

Non-Ex Rock Breaking Cartridges will be applied when blasting hard rocks in sensitive areas as it does not contain high explosives and have low vibrations compared to conventional explosives, also used by Samancor Chrome in Gauteng and Waterkloof mine in Rustenburg.

It is a pyrotechnic composition (low explosives) that break rocks by generating tensile force through rapid gas expansion in a sealed (stemmed) drill hole and have no adverse environmental effects.

- Environmental Impacts Associated with the Non-Ex Rock Breaking Cartridges

Air blast Overpressure

Air blast overpressure is the pressure produced by blasting over and above that of atmospheric pressure produced by explosives. The three main concerns associated with air blast overpressure are human, structural damage and window damage.

Non-Ex ^{TM} method of breaking ensures that expansion gases are contained in the drill hole by effective stemming, which result in very low overpressure levels. Overpressure levels produced by Non-Ex^{TM} are extremely low when compared to conventional explosives and are of a shorter duration and less damaging frequency. This gives Non-Ex^{TM} a major advantage over explosives in environmentally sensitive areas.

Noise

Noise is the part of the air blast pressure wave which falls within the audible frequency region of the human ear. The high frequency portion of the air pressure wave is audible and is responsible for the noise that accompanies a blast. The lower frequency portion is not audible but can excite structures, such as windows, which in turn respond and produce secondary noise such as rattles. Noise levels produced by Non-Ex^{TM} depend largely on the type and nature of the rock broken charge weight, burden, depth of the hole and the effectiveness of the stemming used. A well-stemmed Non-Ex^{TM} cartridge in granite will generally produce a noise level in the

range 80 to 85 dBl at 50 meters from the hole. Noise levels can be attenuated by the use of conveyor belting, or other matting, to cover the holes being fired.

Ground Vibration

Ground borne vibrations from blasting can cause damage to buildings and infrastructure which are in the vicinity of the blast. The degree of the vibration-induced damage caused by blasting is dependent on the magnitude, frequency and duration of the vibration. Generally, low frequency, long duration vibrations are more damaging than higher frequency, short duration vibration. The vibration waves produced by Non-EX™ are mostly of a higher frequency with a mean of 450 Hz, and of short duration and are therefore the least harmful to sensitive structures. In addition, the magnitude of the vibration levels produced by Non-Ex™ is particularly low when compared to explosives over the same distance from the shot hole. When the propellant mixture is a Non-Ex™ cartridge deflagrates, the almost instantaneous change from solid to gaseous matter is accompanied by a very sharp increase in the blasthole pressure and temperature. This is accompanied by a pressure wave that radiates from the drillhole, its amplitude decreasing as the distance from the drillhole increases. The primary factors known to influence the level of ground vibration from the Non-Ex™ cartridges include:

- The weight of propellant per cartridge;
- The distance between the drillholes and the point of measurement;
- The local geological conditions, and the influence of geology and topography on vibration attenuation.

Vibration Limits for Structures

The degree of vibration-induced damage caused by blasting is dependant on the magnitude, frequency and duration of the vibration. Generally, low frequency, long duration vibrations are more damaging than higher frequency, short duration vibrations.

This general rule is contained in recommendations by both the US Bureau of Mines (ÜSB") and the British Standard ("BS"), both of which are widely used in vibration specifications for rock breaking near sensitive structures. The USBM criteria are as follows:

<u>Frequencies above 40 Hz</u>

- PPV less than 50 mm/s- safe zone
- PPV greater than 50 mm/s- damage zone

<u>Frequencies below 40 Hz</u>

- PPV less than 13 mm/s- safe zone (old wooden house)

- PPV greater than 19.5 mm/s- safe zone (modern house)

Safe vibration levels for rock breaking, as defined in the USBM guidelines, can be achieved by Non-Ex™ within 5 metres of a sensitive structure.

Safety Distances

One of the significant advantages of the Non-Ex Rock Breaking Cartridges is that the safety distances are approximately 50 metres from blasting over-sized rock in the open, without any covering. This means that personnel and equipment only require local clearance instead of complete site evacuation. This benefit is that rocks and boulders can be broken in shifts and close to working operations.

The safety distance to infrastructure and sensitive equipment is further reduced by covering the blast with mats and soft soil.

Noxious fumes

The Non-Ex™ cartridge is oxygen balanced so that sufficient oxygen is available for the chemical reaction to achieve optimal oxidation to produce gases consisting of carbon dioxide, nitrogen and steam and thus avoiding the production of noxious gases such as carbon monoxide and nitrous fumes. The reduced quantities of propellant required to break the rock compared to explosives means that considerably less fumes are emitted by the rock breaking event. As a result of the degree of oxidation achieved in the deflagration process, through the incorporation of an effective oxidizing agent and the relatively small amount of propellant used in each hole, the Non-Ex™ cartridge produces a negligible level of noxious gases which are cleared in minutes when an adequate standard of airflow (nominally a velocity of 0.25 metres per second) is available.

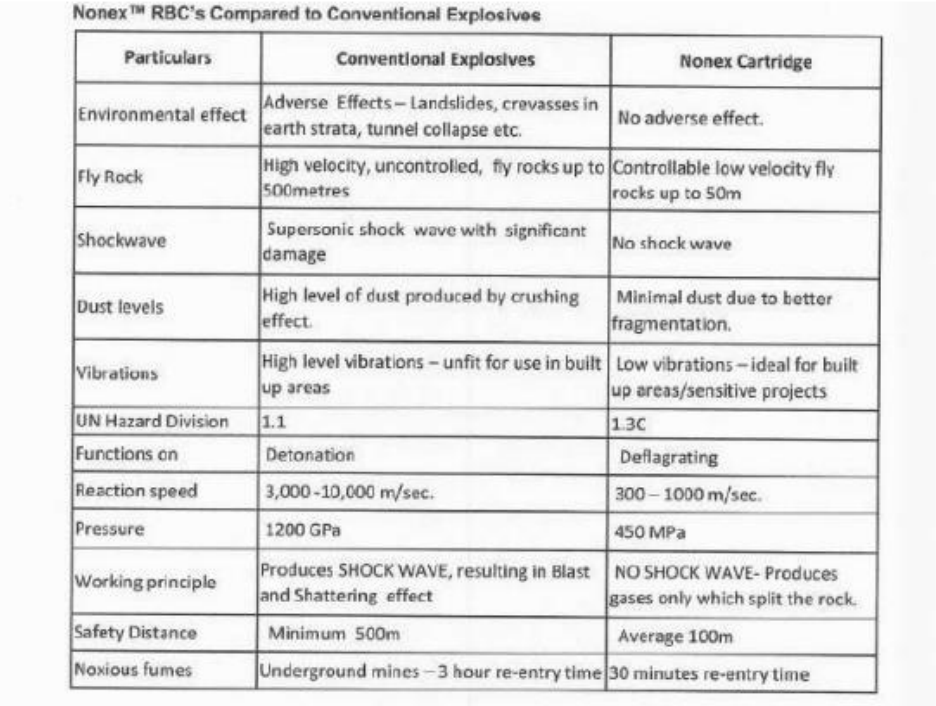
Fly rock

Normally, blasting using conventional explosives requires the rock breaking area to be evacuated for a distance of 500m which means disruption of the production operations and delays to operating equipment. The generation of unpredictable fly rock rules out the use of lay-on charges in any situation where fly rock is restricted.

In contrast, a Non-Ex™ cartridge produces an optimal pressurization of the hole for a given burden and type of rock. By controlling the characteristics of the pressure pulse, the velocity and distance travelled by the dislodged rock can be limited.

Controlled gas release from the Non-Ex™ cartridge, at a relatively low pressure, results in a minimal quantity of low velocity fly rock, which is generally contained within 10m of the rock breaking event. The table below shows clear advantages in the use of Non-Ex.

Table 7: Comparison of Conventional explosives and Nonex Catridge



Nonex™ RBC's Compared to Conventional Explosives

Particulars	Conventional Explosives	Nonex Cartridge
Environmental effect	Adverse Effects – Landslides, crevasses in earth strata, tunnel collapse etc.	No adverse effect.
Fly Rock	High velocity, uncontrolled, fly rocks up to 500metres	Controllable low velocity fly rocks up to 50m
Shockwave	Supersonic shock wave with significant damage	No shock wave
Dust levels	High level of dust produced by crushing effect.	Minimal dust due to better fragmentation.
Vibrations	High level vibrations – unfit for use in built up areas	Low vibrations – ideal for built up areas/sensitive projects
UN Hazard Division	1.1	1.3C
Functions on	Detonation	Deflagrating
Reaction speed	3,000 -10,000 m/sec.	300 – 1000 m/sec.
Pressure	1200 GPa	450 MPa
Working principle	Produces SHOCK WAVE, resulting in Blast and Shattering effect	NO SHOCK WAVE- Produces gases only which split the rock.
Safety Distance	Minimum 500m	Average 100m
Noxious fumes	Underground mines – 3 hour re-entry time	30 minutes re-entry time

5.1.3 No-Go Alternative

By directly creating jobs, opening up commercial opportunities, and generating royalties and taxes, mining significantly boosts the local economy. The benefits of the accompanying employment, economic possibilities, royalties, and tax income will not be enjoyed by South Africa and the local residents if the coal reserves on the site are not exploited. There will be no mineral acquisition and the proposed area will remain bare. The power stations, which rely on coal to generate electricity, could suffer if the proposed mining operation is not approved. This would be bad for the power stations because they need coal to generate electricity.

The company identified the need for coal in the area due to an increase in coal usage. In this light the applicant identified the proposed areas as the preferred and only viable site alternative. From extensive work conducted previously in this area, it is known that this area contains the resource being sought.

6 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

The Public Participation is the basis of any EIA process. The Public Participation Process (PPP) seeks to provide

the opportunity for all stakeholders including potential players and all applicable I&APs, state departments, state bodies and the competent authority (CA) to register so that they can raise concerns, contribute to local knowledge, comment on the Draft Basic Assessment Report (DBAR) & Environmental Management Programme report (EMPr) but most importantly provide suggestions for enhanced benefits. Comments received during the Public Participation Process will be incorporated into the Final BAR & EMPr to be submitted to the competent Authority being the Department of Mineral Resources & Energy for Adjudication

6.1 Defining Stakeholders

The term public can be taken to mean any individual or group in society, including the government and business sector. Who or what is included in the "public" depends very much on activities under consideration. The term "stakeholder" helps clarify the meaning or "public" in the context of development activities.

A Stakeholder is any person, group of institution that has an interest in an activity, project or program. This includes both intended beneficiaries and intermediaries, those positively affected, and those involved and/or those who are generally excluded from the decision-making process.

Stakeholders can usefully be categorized in five main types:

- Directly affected people (who live or work where the project will be located)
- Indirectly affected people (who live nearby or use resources from the project area)
- Public sector agencies (ministries, provincial or local government, government mandated mass organizations)
- Private developers (private companies with a direct investment in the project) and their subcontractors and financiers
- Others (donors, NGOs with a stake in the project, external advisors, the business sector).

6.2 Objectives of the Public Participation

Main objectives for involving the public are:

- The identification of key issues of concern to the public, addressing public perceptions,
- The provision of local expertise and knowledge,
- The identification of possible alternatives/options,
- Ensuring that affected groups are involved at the very beginning of project design, and
- The critical review of documentation.

The separation of these objectives is somewhat artificial as the achievement of one will often depend upon the achievement of another.

6.3 Regulatory framework

- Chapter 6, regulation 40(2)(3) of EIA Regulations (GNR 326, 7 April 2017) requires that the PPP provides access to all information that may have the potential to influence the decision regarding the applications. It further outlines that the potential interested and affected parties (I&APs) be provided with an opportunity to comment on project reports and plans.
- The Mineral and Petroleum Resources Development Act (MPRDA) (Act 28 of 2002) and EIA regulations 2014, published under Government Notice No. 982 in Gazette No. 3822 of 4 December 2014, amended on 7 April 2017.
-

6.4 Details of the Public Participation Process Followed

The stakeholder engagement process was initiated and employed several techniques to establish contact and raise awareness amongst stakeholders regarding the application.

6.4.1 Interested and Affected Parties Identification Procedure

The Interested & Affected Parties for this particular project were identified through telecommuting (via e-mail media communications and telecommunications). Other means of Identification & notification adopted was through the print media in a form of newspaper advert and placement of A2 size notices in prominent spaces.

6.4.2 Newspaper advertisements

A newspaper advertisement was placed and published in the local paper, Excelsior on the 02nd of December 2022 to notify all the Interested & Affected Parties of the proposed project.

6.4.3 Public Space Notices

A2 size notices will be placed in farm Boundaries, adjacent properties and places often frequented by community members such as schools , Mkhondo Local Municipality , Mkhondo Public Library and on the access road to the farm.

6.4.4 Conclusion of the consultation process followed

Background Information Documents (BIDs) will be provided to Governmental Departments, to introduce the project and to invite them to forward views, comments and recommendations about the project. Stakeholder engagement & consultation through BID commenced for 30 days from the day of announcement.

The Draft BAR and EMPR will be released for a period of 30 days excluding public holidays declared in terms of Section 2A of the Public Holidays Act of 1994.

Hard copies of the DBAR and EMPr will be submitted to organs of state and relevant authorities i.e Mpumalanga Tourism Parks Agency (MTPA), Department of Agriculture, Land Reform and Rural Development (DALRRD), South African National Roads Agency Ltd (SANRAL) & Inkomati Usuthu Catchment Management Agency. Additionally, copies will be available at the following places: Mkhondo Local Municipality & Mkhondo Public Library. The electronic copies will be made available upon request from Singo Consulting (Pty) Ltd, using the detailed EAP'S contact's below, via emails; Dropbox link; Google drive; WeTransfer, etc.

6.5 List of Surface Rights/Landowners Identified and Notified

The land belongs to Kangra Coal (Pty) Ltd as per the tittle deed illustrated in Table 8 below

Newspaper Publication

Letter to the Editor

I had business to conduct in Vryheid on Monday 10 October.

Rumours of how busy the road to Paulpietersburg and from there to Vryheid is, left me (woman alone) a bit nervous. Nevertheless I had to go.

A lot of coal trucks are travelling on this route, because of the N2 Pongola road being unaccessible to them. This is normally such a tranquil quiet road, but not anymore.

The fact that I want to share is that I experienced many a courteous coal truck driver on my way. They moved over to the side of the road to afford me the opportunity to get past and they indicated when the road was clear to overtake.

Some impatient drivers of normal vehicles and bakkies (driving between these trucks) were another story. They took chances to overtake where it was not safe and I had a few close encounters.

Don't only concentrate on the coal trucks, see the bigger picture. Before going on the road, be well rested, don't text on your cellphone and see that your vehicle is roadworthy.

There is not a place for "cowboys" on the road. Arrive alive!

Reality Check

Three-ingredient condensed milk ice cream

Perfect for warm summer days

This homemade condensed milk ice cream recipe is a delicious one!

Making your own ice cream means you know what is going to be in it. It can be healthier (or more naughty) if you want it to be! It is also great because you can make it whatever flavour you want!

But truly - it is already very sweet - because its main ingredient is condensed milk! The only problem with making your own ice cream at home is that it tends to go very hard when you freeze it. But to stop that from happening, once the ice cream has been frozen, pop it into a large zip lock bag - and it will be totally scoopable right away!

Ingredients:

- 1 tsp Vanilla Extract
- 1 Can Sweetened Condensed Milk (395 Grams)
- 1 Thickened Cream (600 Millilitres)

Method:

1. Beat the cream with an electric mixer until it begins to thicken.
2. Add the vanilla and beat until a light whipped cream forms.
3. Gradually add the condensed milk and keep beating until it thickens and becomes a nice cream.
4. Pour into a container and freeze until hard.

Recipe hints and tips:

- You can add all sorts of flavourings depending on what you like, macadamia nuts, mango puree, coffee, strawberries, you favourite chocolate bar, coconut - anything you like!

Source: https://www.stayathome-mum.com.au/recipes

Lowveld Hunters Association Golf Day

Kate-Merie Ferreira

On Saturday 8 October, the Lowveld Hunters Association hosted a golf day at the Piet Retief Country Club, in order to raise funds for the renovation of their shooting range.

68 people participated in the event and with the help from sponsors, prizes were handed out to the top players.

After the tournament, everyone enjoyed a delicious meal together.

The top players of the day were:

- Longest drive women - Linda Needham
- Longest drive men - Jurgen Gevers
- Nearest to the pin - Arina Böhmer
- Nearest to the pin - Anton Bakker and Nkosi-Dlamini

The top-6 teams were:

1. Ulrich and Arina Böhmer
2. Steven and Estiaan Smit
3. Rudi Woest and Jan Oukamp
4. Jaco Smit and Jan-Hendrik Viljoen
5. Ralton and Elizabeth Lewis
6. Danie Schoeman and Linda Needham

Thank you to everyone who supported this initiative and many thanks to the sponsors of the day.

Piet Retief Parkrun

David Mkhonta

On Saturday morning the 8th of October, 64 people participated in the Piet Retief Parkrun.

Congratulations to the top ten:

1. Kunene Phakamani - 19:13
2. Zwakele Welcome Mntambo - 25:39
3. Unknown
4. Shayne Bligraut - 26:10
5. Zakhele Mashego - 26:40
6. Sheldon Hallis - 27:41
7. Corrie Nel - 28:43
8. Sibinelo Mbuli - 29:09
9. Anton Robberts - 29:34
10. Malachi Mans - 29:42

A goal setting helps trigger new behaviours, guides your focus and helps you sustain that momentum in life.

Special thanks to the weekly volunteers!

Source: https://www.parkrun.co.za/pietretief/results/latestresults/

NOTICE OF A JOINT PUBLIC PARTICIPATION PROCESS FOR A MINING PERMIT AND ENVIRONMENTAL AUTHORISATION APPLICATION

ISIZULU

Isicelo Semvume Yezimayini: **I-Vernex Holdings (Pty) Ltd** ifake Isicelo Semvume Yezimayini ku-**(DMRE Ref: MP 30/5/1/1/3/13020 MP)** ngenhloso yokumba **Amalahle engxenyeni yeNdawo esele ye ipulazi i-Klipspruit 138 HT,** ngaphansi kwesiFunda sikaMantshi **sase-Wakkerstroom, eSifundazweni saseMpumalanga.**

ISIMEMO SOKUPHAWULA NOKUVEZA IMIBONO MAYELANA NALE APPLICATIONI

Isaziso sinikezelwe ngokoMthetho Wo-Kuthuthukiswa Kwezimboni Kanye Neza-mafutha (IMPRDA) (uMthetho wama-28 ka-2002)kanye nemithethonqubo ye-EIA ka-2014, eshicilelwe ngaphansi kweSa-ziso Sikahulumeni No.982 kuGazethi No. ukuthi **i-Vernex Holdings (Pty) Ltd** ifake isicelo Semvume Yezimayini yale mineral eshiwo ngenhla ene-**(DMRE Ref: MP 30/5/1/1/3/13020 MP)** Njengengxenye yenqubo ye-EIA, ikakhu- lukazi inqubo yokubamba iqhaza kom-phakathi kule phrojekthi ehlongozwayo, Abanentshisekelo Nabathintekayo (I&APs) bayamenywa ukuba babhalise futhi bale-the noma yikuphi ukuphawula noma ukukhathazeka ukuze kufinyelelwe **Ms Zwivhuya Tshabuse** kusetshenziswa othin- tana nabo abangezansi. Umphakathi uyamenywa futhi ukuthi ubuyekeze futhi uphawule ngoMbiko Owuhlaka Wokuhlola Okuyisisekelo (DBAR) kanye nombiko weHlelo Lokuphathwa Kwemvelo (EMPr). I-BAR ne-EMPr engaka-phelli izothola kala ukuthi ibuyekezwe izin-suku ezingu-**30 enkathini yekhalenda mhla ziyi-13 kuDisemba 2022 kuya kumhla ziyi-03 Februwari 2023.** Lo mbiko uzo-tholakala **e-Mkhondo Public Library** Nga-phezu kwalokho, ikhophi elitnambile uma licelwa lizotholakala (via email; Dropbox link; Google drive;We Transfer,etc.)nge -sicelo esivela kwa-Singo Consulting (Pty) Ltd, kusetshenziswa imininingwane yokuxumana no Dokotela Ohlola Imvelo (EAP) u Dkt Kenneth Singo kanye nochwepheshe beseMvelo (Envir.Tech) kuNksz Zwivhuya Tshabuse ngezansi.

ENGLISH

Application for Mining Permit: **Vernex Holdings (Pty) Ltd** has lodged an application for Mining Permit with **(DMRE Ref: MP 30/5/1/1/3/13020 MP)** for the purpose of extracting **Coal** on **portion of the remaining Extent of the farm Klipspruit 138 HT,** under the Magisterial District of Wakkerstroom, Mpumalanga Province.

INVITATION TO COMMENT

Notice is hereby given in terms of the Mineral and Petroleum Resources Development Act (MPRDA) (Act 28 of 2002) and EIA regulations 2014, published under Government Notice No. 982 in Gazette No. 3822 of 4 December 2014, amended on 7 April 2017 that **Vernex Holdings (Pty) Ltd** has applied for a Mining Permit for the above-mentioned mineral with **(DMRE Ref: MP 30/5/1/1/3/13020 MP)**

As part of the EIA process, more specially the public participation process for this proposed project, Interested and Affected Parties (I&APs) are invited to register and kindly submit any comments or concerns to reach **Ms Zwivhuya Tshabuse** using the contacts below. The public is also invited to review and comment on the Draft Basic Assessment Report (DBAR) and Environmental Management Programme report (EMPr). The draft BAR & EMPr will be available for review for 30 days calendar period **13th of December 2022 to the 03rd of February 2023.** This report will be available at **Mkhondo Public Library** and Furthermore, electronic copies will be made available (via email; Dropbox link; Google drive; We Transfer, etc.) upon request from Sin-go Consulting (Pty) Ltd, using the contact details of the Environmental Assessment Practitioner (EAP) Dr Kenneth Singo and Environmental Technician (Envir. Tech.) Miss Zwivhuya Tshabuse below.

EAP and Envir. Tech. Contact Details

Singo Consulting (Pty) Ltd

Office 870, 5 Balalaika Street,
Tasbet Park Ext 2, Witbank,1040
Tel No.: +27 13 6920 041
Cell No.: +27 67 904 7475
Fax No.: +27 86 5144 103
E-mail: zwivhuya@singoconsulting.co.za

Applicant Details

Vernex Holdings (Pty) ltd

Physical Address: 4695 Monyal Street, Ackerville, Witbank, Mpumalanga, 1039

Contact person: Mr William Sindane
Tel No.: +27 63 342 6983
Fax: 086 514 4103
E-mail: wimprojects2@gmail.com

Site Notices

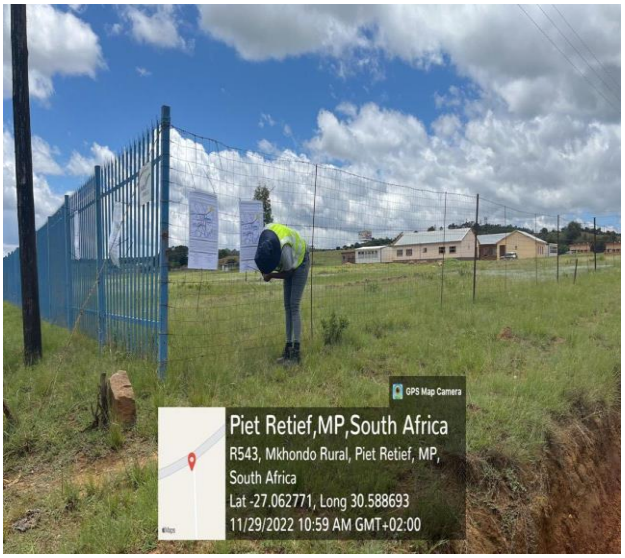


Table 8: WinDeed results

Deeds Office Property - List

HT, 138, MPUMALANGA

Lexis® WinDeed

Any personal information obtained from this search will only be used as per the Terms and Conditions agreed to and in accordance with applicable data protection laws including the Protection of Personal Information Act, 2013 (POPI), and shall not be used for marketing purposes.

SEARCH CRITERIA			
Search Date	2022/10/11 14:59	Farm Number	138
Reference	-	Registration Division	HT
Report Print Date	2022/10/11 15:00	Portion Number	-
Farm Name	-	Remaining Extent	NO
Deeds Office	Mpumalanga	Search Source	Deeds Office

PORTION LIST				
Portion	Owner	Title Deed	Registration Date	Purchase Price (R)
0	KANGRA COAL PTY LTD	T608/2004	-	-
1	ZEELIE HENDRIK JACOBUS	T87794/1995	-	-
2	KANGRA COAL PTY LTD	T607/2004	-	-

LexisNexis®

0861 946 333
windeed.support@lexisnexis.co.za
search.windeed.co.za | www.windeed.co.za

6.6 Summary of issues raised by I&APs

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		**Date** Comments Received	**Issues raised**	**EAPs response to issues as mandated by the applicant**	Section and paragraph reference in this report where the issues and or response were incorporated.
AFFECTED PARTIES					
Landowner/s					
Kangra Coal Pty Ltd			To be completed after 30 days review period		
Lawful occupier/s of the land					
Kangra Coal Pty Ltd					
Landowners or lawful occupiers on adjacent properties					

N/A					
Municipal councillor					
Municipality					
 **Department of Environment and Waste** **Management** **De Wet St, Piet Retief** Mr Vusi Dube **Department of Town planning** Mr Ntando Bembe nlbembe@gmail.com Tmazibuko@Mkhondo.gov.za	X		To be completed after 30 days review period		

Gert Sibande District Municipality **Oosthuise street,** **Ermelo,2351** orbertM@gsibande.gov.za	X				
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DW					
38, 44 Ida Street, **Lynnwood glen, Pretoria** Ria Barkhuizen Email: nrstat@nra.co.za Tell: +27 12 426 6200	X		To be completed after 30 days review period		
Mpumalanga Region Wayleavesmou Email:	X				

Wayleavesmou@eskom .co.za Tshifhiwa Nekhavhambe NekhahTT@eskom.co.za					
TRANSNET Yuza Chabalala **Email:** yuza.Chabalala@transnet.net	X		To be completed after 30 days review period		
INKOMATI-USUTHU CATCHMENT MANAGEMENT AGENCY **Inkomati-Usuthu Catcchement Management Agency** **Sonnyboy Mhlongo** Environmental Officer: Water Use Authorization Suite 801, The MAXSA Building, 13 Streak Street	X				

Tel: +27 13 753 9000 **Cell:** +27 78 1206094 mhlongos@iucma.co.za					
Communities					
KwaNgema Community					
Dept. Land Affairs					
Department of Rural Development and Land Reform 200 Street Address: Restitution House, 30 Samora Machel Drive, NELSPRUIT Thomas Sambo Thomas.sambo@dalrrd.gov.za Lazarus Masuku Lazarus.Masuku@dalrrd.gov.za	X		To be completed after 30 days review period		
Traditional Leaders					
KwaNgema Tribal House	X	12/08/2022 (Meeting)			
Dept. Environmental Affairs					

forestry, fisheries and the environment Department: Forestry, Fisheries and the Environment REPUBLIC OF SOUTH AFRICA Environment House 473 Steve Biko and Soutpansberg Streets, Pretoria slekota@environment.gov.za Portia Makitla PMakitla@dffe.gov.za	X		To be completed after 30 days review period		
Other Competent Authorities affected					
Mpumalanga Tourism and Parks Agency	X				
OTHER AFFECTED PARTIES					

7 ENVIRONMENTAL ATTRIBUTES AND ASSOCIATED ALTERNATIVES

The environmental attributes described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects.

8.1 The Baseline Receiving Environment

This section describes the baseline receiving environment of the Mining Permit application area. Information in this section is based on specialist studies undertaken in support of this application, desktop studies and a site visit by the EAP as well as input from the public through the I&AP questionnaire. As such, the descriptions below of environmental features represent a consolidation of relevant information to the application area.

8.2 Socio Economic Environment

The proposed project area is located in Mkhondo Local Municipality within Gert Sibande District Municipality (GSDM), Mpumalanga Province. The socio-economic analysis is based on a desktop study of existing socio-economic information and development strategies contained in the governmental national, regional and local databases (Statistics SA: Census 2011/2016 and Community Survey 2016), IDP and Census data from the Municipal IDP (2017- 2022).

Table 9: Mkhondo Local Municipality Structure

Urban nodes	Rural nodes/Settlements
• Mkhondo (Town) • Thandakukhanya • Amsterdam • KwaThandeka	• Saul Mkhizeville • KwaNgema • Mahamba • Dirkiesdorp/Mabola • Iswepe • Stafford • eNtombe • Commondale

The Municipality comprises of forestry plantations and much of its economy originates from this source. Mondi, Sappi, TWK and Komati Land Forests are the major companies that lead the forestry industry in the municipality. Mkhondo Local Municipality is known for wood processing, furniture, manufacturing, and coal briquettes manufacturing. A number of timbers producing companies are located within the municipality, including Mpact, Tafibra and PG Bison and Normandien which are national businesses. Large-scale agriculture is limited in the municipality due to the extensive use of land for forestry.

The municipality's primary economic components are forestry, mining, and subsistence farming. Mkhondo Local

Municipality is home to two significant mining firms (Jindal and Kangra Coal Pty (Ltd). In comparison to other local municipalities in Mpumalanga, Mkhondo Local Municipality ranks low in terms of tourism. There is, nevertheless, a lot of tourism potential within the municipality, thanks to the South African heritage sites that are located there.

8.2.1 Population Distribution

According to Stats SA (2016) the population of Mpumalanga Province has increased. The population of Gert Sibande District Municipality has increased from 1 043 194 in 2011 to 1 135 409 in 2016 and that of Mkhondo Local Municipality has also increased (from 171 982 in 2011 to 189 036 in 2016). It is evident that the Gert Sibande District recorded an increase in population of 92216 people between 2011 and 2016. It noteworthy that Mkhondo Local Municipality grew at a rate of 2.0 % during the 2011 to 2016 period. This shows that the Gert Sibande District is ever-growing in population, between 2001 and 2011, there was an increase of +152 496 people.

Table 10: Mkhondo Local Municipality Population Distribution (IDP 2017- 2022)

	2011	2016	Growth rate	Projected 2030 number
Population	**171 982**	**189 036**	**2.0%**	**252 874**
Number of House Hold	**37 433**	**45 595**		
House Hols living in RDP House	**11 733**			
House Hold in Shacks within Informal Settlements	**642**	**508**		

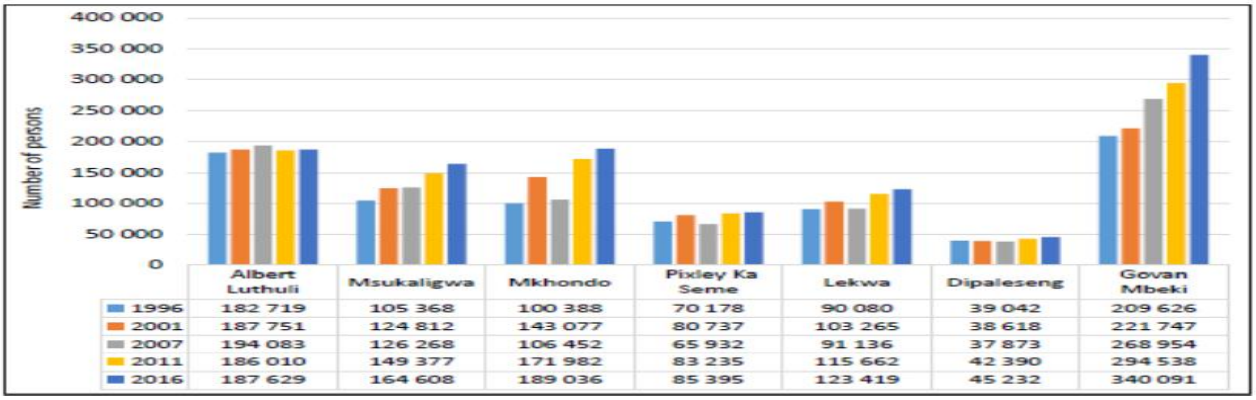


Figure 13: Population 2001 vs 2011 vs 2016

8.2.2 Education & Unemployment

The number of people with 'no schooling' has declined from 2001 to 2011, while those with 'matric 'has increased. According to the Final MLM Draft SDF (2016) the settlements with the lowest education level are Ngema Tribal Trust, Mkhondo Non-urban, Saul Mkhizeville and KwaNgema. These are the settlements that are in close proximity to traditional areas or informal settlements. Settlements with the highest education levels are eMkhondo, Iswepe and Amsterdam (UP Enterprise, 2016).

Table 11: Educational Background 1996 vs 2001 vs 2011 vs 2016

EDUCATION BACK-GROUND	1996	2001	2011	2016
No Schooling	18 000	22 806	15 914	38 045
Grade 7	3 360	4 304	4 543	7880
Grade 12	5 594	8 674	22 600	30841
Higher than Grade 12	1 759	2 411	4 575	

Sources: STATS SA 2016

(Sources: STATS SA Community Profile (2001, 2011 and 2016)

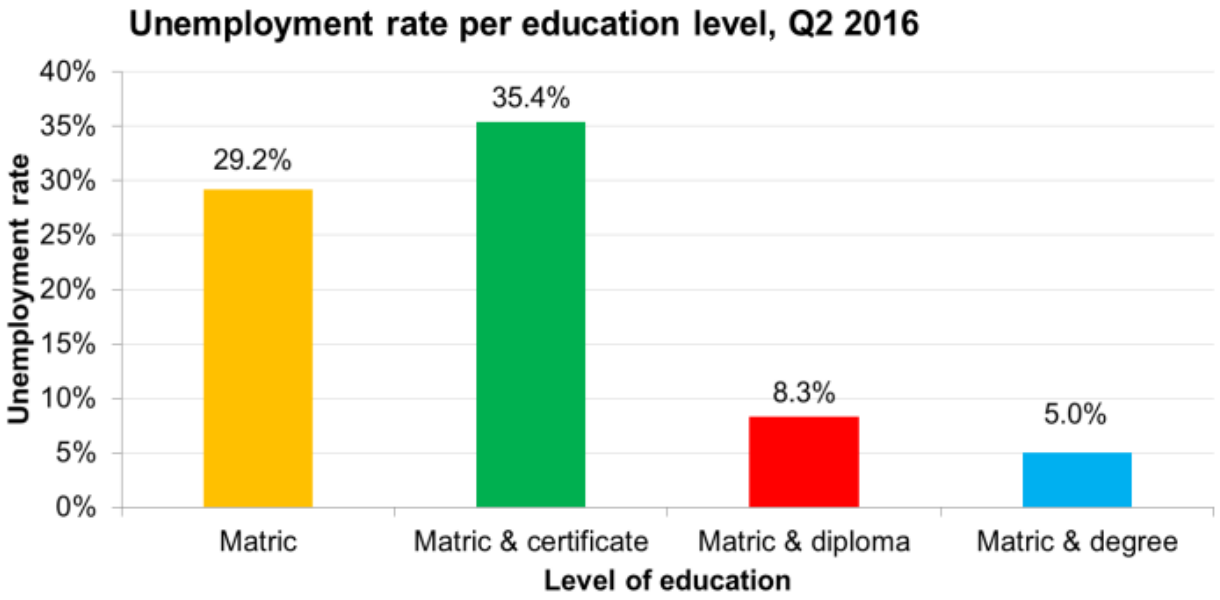


Figure 14: Unemployment rate per education level, Q2 2016

8.2.3 Gross Value Added (GVA) Contribution for Mkhondo Local Municipality

The sector or industry that contributes the most to the GVA of the municipality is community services (22.2 %) followed by trade (18.4 %), agriculture and forestry (16 %), finance (14.8 %), mining (11.9 %), transport (7.6 %), manufacturing (5.4%), construction (2.3%) and utilities (1.4 %).

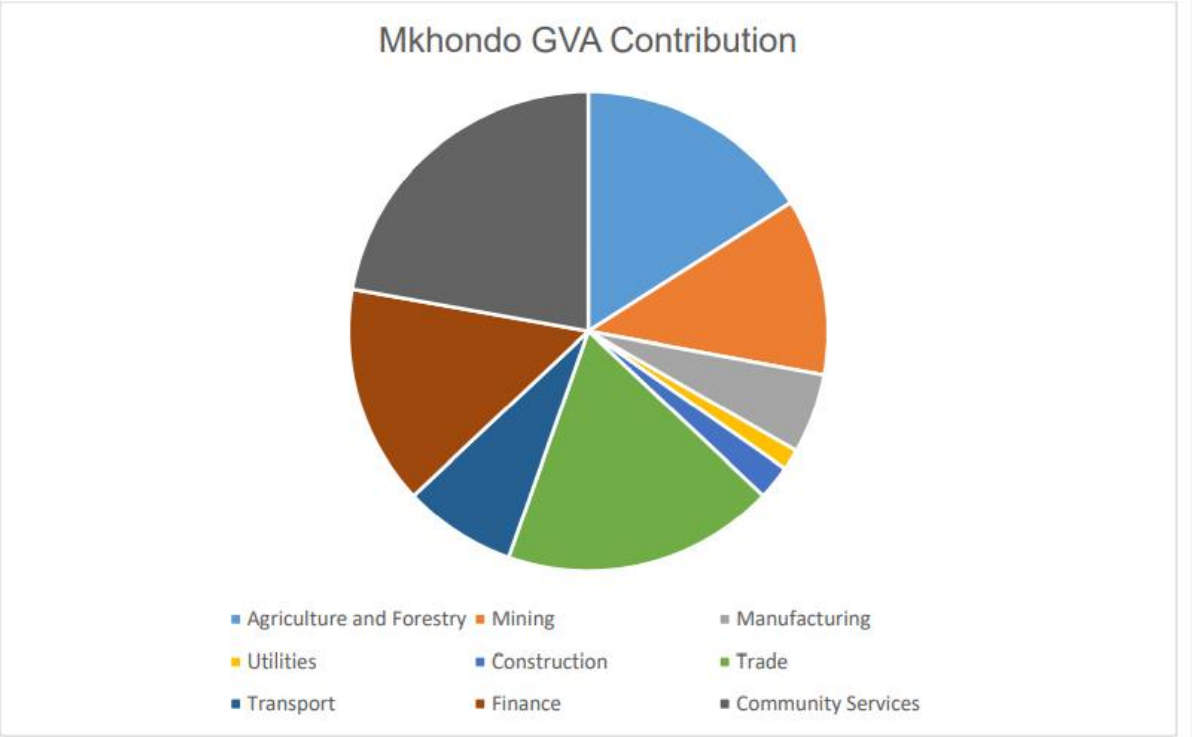


Figure 15: Mkhondo GVA Contribution (2017- 2022)

Concluding Remarks

Socio-economic information detailed in this section of the report provides an understanding of the need for economic development which is to further create employment opportunities. The people most affected by the proposed project is the community residing near/around the project area. Although there are economic/agricultural activities taking place in close proximity to the application area, most of the people residing within the 20 km radius; in this context being Dirkiesdorp, Driefontein and Kwa Ngema remain unemployment and underprivileged. Not implementing the activities will result in a loss of potential economic development and opportunities that comes with the development.

8.3 Geology

The Geology of the proposed site is underlain by Vryheid formation which is characterized by fine-to coarse-grained sandstone, shale, and coal seams. The PermianVryheid formation hosts most of Southern Africa's economic coal reserves. The Witbank coalfield has produced a large proportion of coal mined for export as well as for the local market. As such, it is one of the most important geographic as well as geological regions with respect to coal distribution and coal production (Cadie, 1987).

Karoo Supergroup

The proposed project area follows under the main Karoo supergroup, under Ecca group. The sedimentary part of the Karoo Supergroup is subdivided into four main lithostratigraphic units, which from the base up are the Dwyka, Ecca, Beaufort and Stormberg (Molteno, Elliot and Clarens formations) groups (Johnson et al., 1996; SACS, 1980;). These are capped by some 1.4 8 km of basaltic lavas of the Drakensberg Group (Johnson et al., 1996; Veevers et al., 1994), the extrusion of which is related to the break-up of Gondwana (Cox, 1992). The basement to the Karoo Supergroup fills in both the MKB and in the northern basins is heterogeneous (Bordy et al., 2004; Hancox, 1998; Rutherford, 2009) and this heterogeneity plays a significant control on the nature of the fill, particularly during the early phases of the deposition of the Karoo Supergroup.

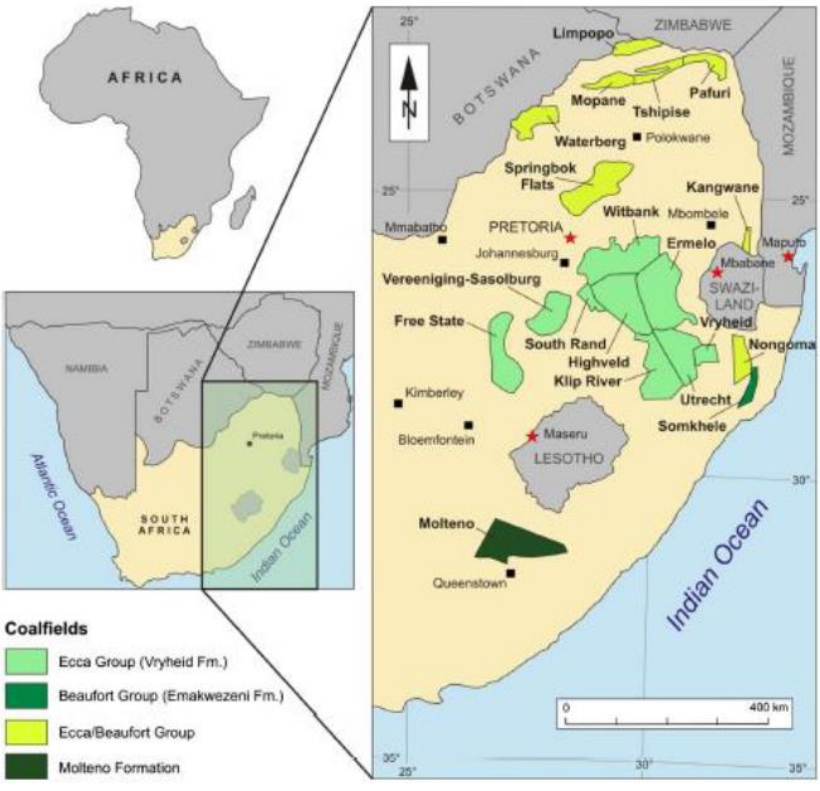


Figure 16: Coal field of South Africa (adopted from Hancox and Gotz, 2014).

Dwyka Group

The rocks of the Dwyka Group in South Africa are amongst the most important glaciogenic deposits from Gondwana. This Group is named for exposures along the Dwyka River east of Laingsburg and forms the basal succession of the Karoo Supergroup. Dwyka Group strata are mostly contained within bedrock valleys incised into Archean to lower Palaeozoic bedrock (Visser, 1990; Visser and Kingsley, 1982; Von Brunn, 1996). The lithologies in the areas underlying the coalfields of South Africa consist of a heterolithic arrangement of massive and stratified polymictic diamictites, conglomerates, sandstones and drop stone-bearing varved mudstones. The easily identifiable lithologies form a good marker below the coal bearing Ecca Group. In the distal sector of the MKB these sedimentary strata accumulated largely as ground moraine associated with continental ice sheets and is generally composed of basal lodgement and supraglacial tills. These deposits are generally massive, but crude horizontal bedding occurs in places towards the top (Tankard et al., 1982).

Ecca Group

In the 1970s several studies (Cadle, 1974; Hobday, 1973, 1978; Mathew, 1974; Van Vuuren and Cole, 1979) showed that the Ecca Group could be subdivided into several informal units based on the cyclic nature of the sedimentary fills. In 1980 the South African Committee for Stratigraphy (SACS, 1980) introduced a formal lithostratigraphic nomenclature for the Ecca Group in the northern, distal sector of the MKB, which replaced the previously used informal

Lower, Middle, and Upper subdivisions with the Pietermaritzburg Shale Formation, the Vryheid Formation, and the Volksrust Shale Formation.

Ermelo coalfield

The Emerlo Coalfield's southeasterly region contains the project area. The Carolina Dirkiesdorp, Hendrina, Breyten, Davel, Ermelo, and Morgenzon districts in the southeast Mpumalanga Province are home to the Ermelo Coalfield. It covers an area of around 11,250,000 acres and stretches for about 75 km east to west and 150 km north to south. The sub-outcrop of the coal-bearing strata against pre-Karoo basement determines the northern and eastern limits of the Ermelo Coalfield. The Ermelo Coalfield borders the Witbank and Highveld coalfields to the west and the Klip River and Utrecht coalfields of KZN to the south. There is a weak (thin) coal development area between Ermelo and the Highveld Coalfield's westernmost portion, where no coal mining is done

Karoo Dolerite suite

Dolerite is the medium grained, intrusive, equivalent of a basalt (link to basalts). It usually occurs as dykes, plugs or sills. Being intruded into country rocks at shallow levels, the magma has more time to cool than if extruded. This allows for the growth of constituent minerals to the point where the groundmass crystals may be easily identified with a hand lens if not the naked eye. Dolerites may be porphyritic, containing phenocrysts of plagioclase, olivine and even quartz (an olivine analcite dolerite is known as a crinanite).

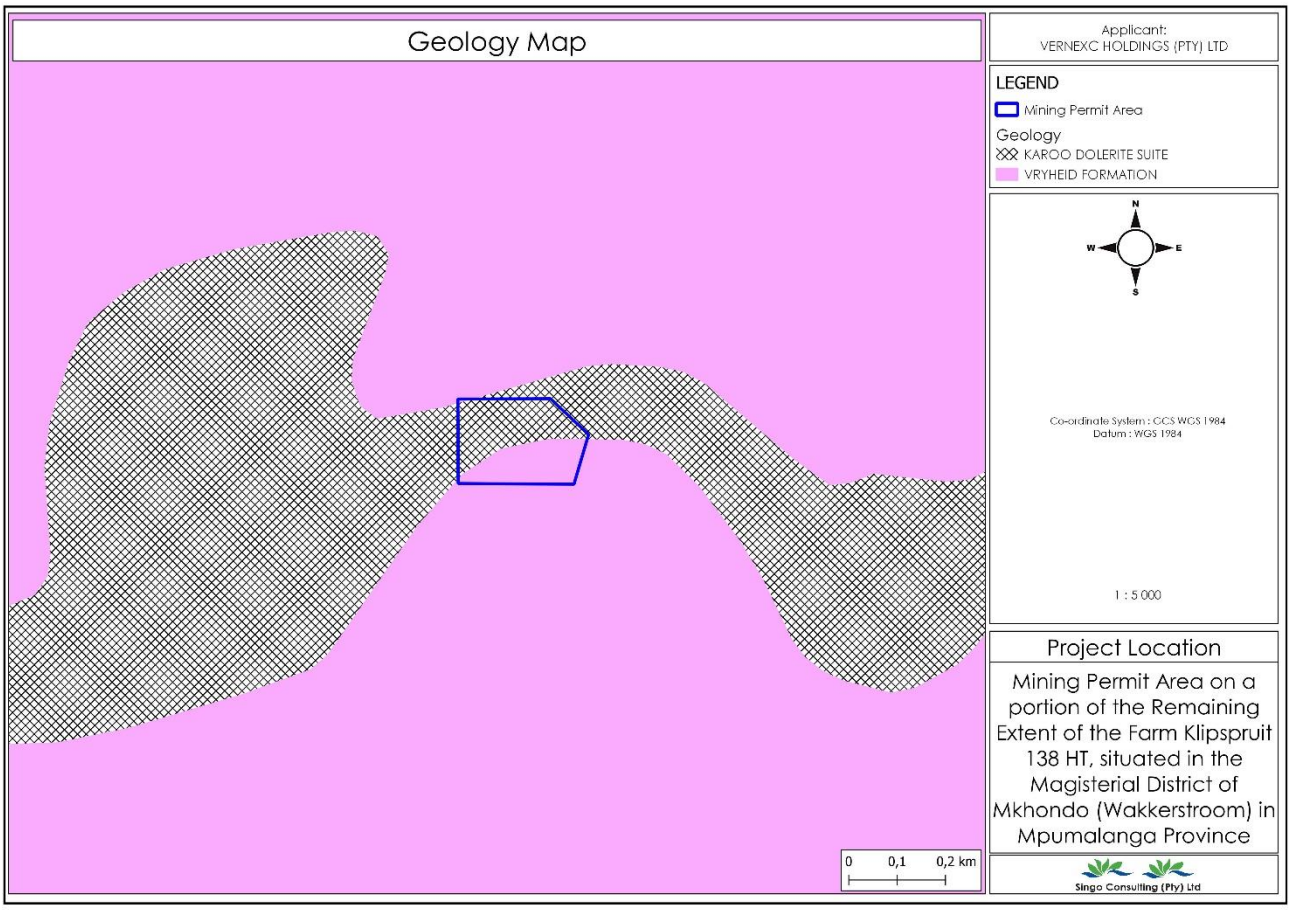


Figure 17: Geology of the proposed project (Singo Consulting GIS Team, 2022).

8.4 Soils

The soils in the area vary significantly in physical and chemical composition over the different areas. They are strongly influenced by the underlying rocks (geology) from which they are derived from through the process of weathering, as well as by their position in the landscape and the origin of the parent material (in-situ versus colluvium derived). The proposed mining permit area is essentially covered with the Freely drained, structureless soils, according to the map produced by Singo Consulting's GIS specialist.

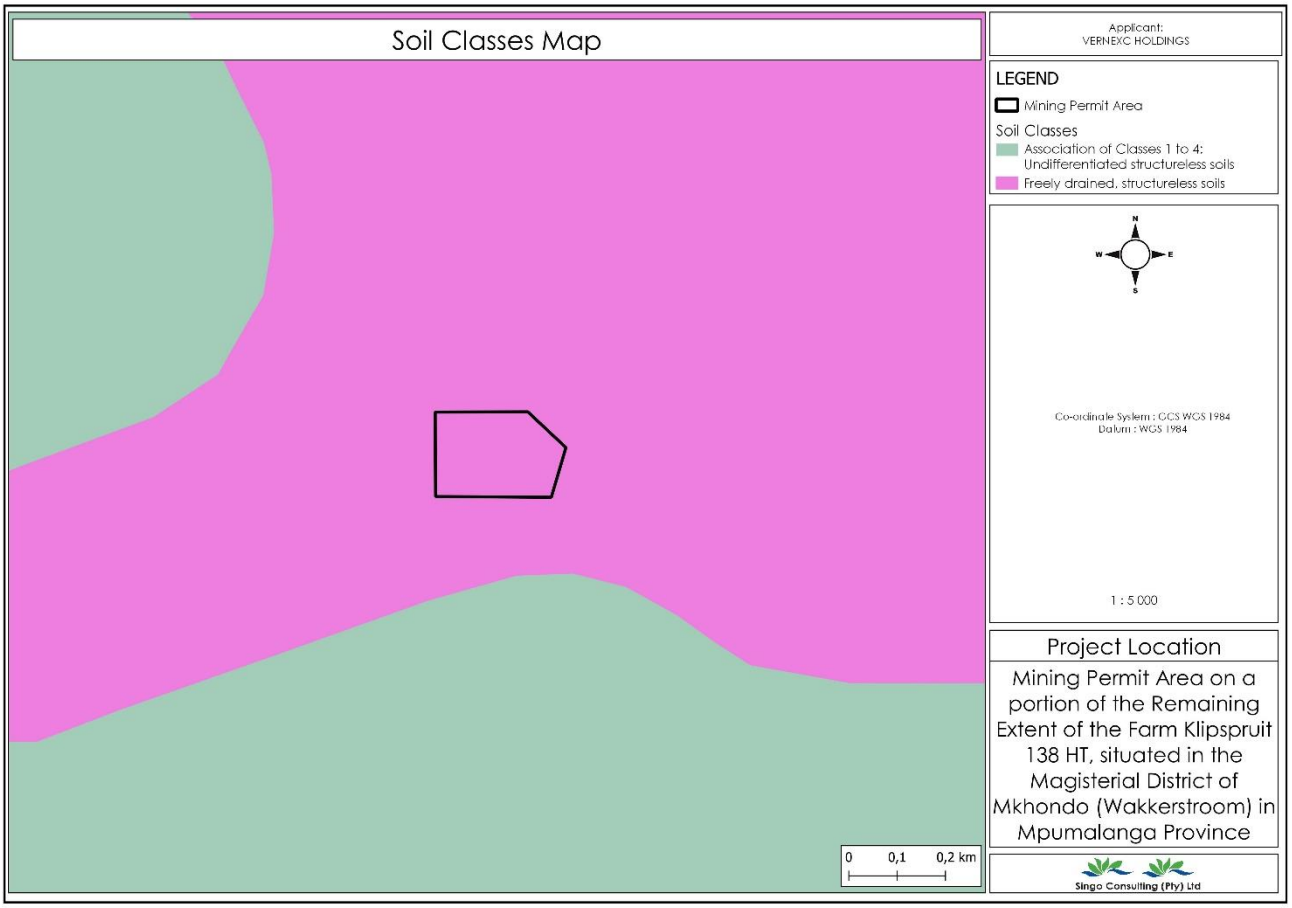


Figure 18: Soil classes map for the project area (Singo Consulting GIS Team, 2022).

Mining operations have the potential to damage soil resources 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. Due to the increased activity of trucks and heavy machinery the possibility of soil contamination by leaking oils and fuels is increased. The contamination of soils may contribute to the contamination of surface and groundwater resources. Increased soil erosion can be caused by a loss in vegetative cover resulting in increased water runoff. This is especially likely to occur on sloping terrain. Impacts on soil structure can result in changes to soil drainage, increasing runoff and erosion, and may also result in further potential knock on effects impacting on surface and underground water resources. Loss of the topsoil resource reduces chances of successful rehabilitation and restoration. The above impacts on soil resources will be negative but site specific. Following the potential impacts on the soils, mitigation measures have been proposed in the EMPr. Although the impacts cannot be completely avoided, they can be controlled and mitigated, and their significance will remain low to moderate if and when mitigation measures are implemented.

8.5 Land Capability

From the basic Environmental Impact Assessment, it was found that the proposed area is merely utilised for cattle grazing from time to time. Land capability is inextricably tied to soil quality. Land capability refers the potential of land to support different land uses, and is determined by the physical, chemical and biological properties of the soils. In nature these qualities develop over millennia and are dependent on the type of underlying parent rock, the geographic locality, and climate. On rehabilitated land, the desired land capability is reinstated by re-creating the key fundamentals of what defines land capability (e.g., soil type, soil depth, soil texture, soil density, soil chemistry, topographic slope, and soil microbiology). Upon Rehabilitation, the land will be transformed to arable land for which the agricultural activities taking place on either adjacent property of the area can be extended towards the mined area. The land capability of the proposed project area is classified into arable. In this classification the arable soils are grouped according to their potentialities and limitations for sustained production of the common cultivated crops that do not require specialized site conditioning or site treatment. Nonarable soils (soils unsuitable for long time sustained use for cultivated crops) are grouped according to their potentialities and limitations to produce permanent vegetation and according to their risks of soil damage if mismanaged. The land capability of the proposed area is classified as an arable land. Arable land is any land capable of being ploughed and used to grow crops.

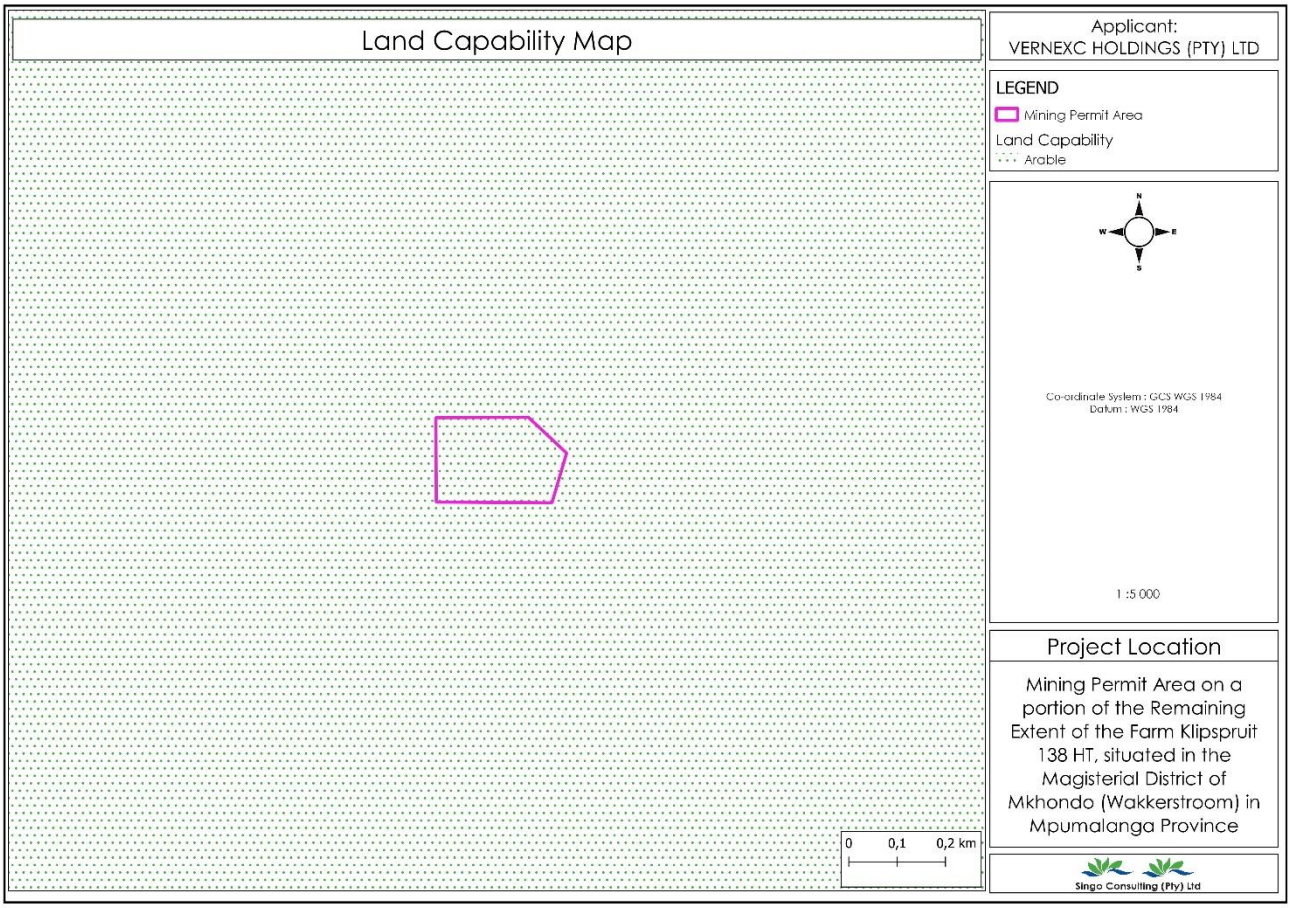


Figure 19: Land Capability map of the project area (Singo Consulting GIS Team, 2022).

8.6 Climate

Mkhondo has a Temperate highland tropical climate with dry winters climate (Classification: Cwb) The climatic conditions described in this section are based on the W5E009 weather station, which is the closest to the project site, at about 18 km southwest.

8.6.1 Temperature

Over the course of the year, the temperature typically varies from 0,1°C to 32°C. Table 12 below shows the monthly minimum, maximum and average temperatures for January 2016 - December 2018. December is the hottest month with temperatures reaching up to 32°C, followed by the months October, November and January ranging from 30°C – 30,5 °C. July is the coldest month, with temperatures as low as 0.1°C.

8.6.2 Rainfall

In Mkhondo, the wet season is comfortable and partly cloudy and the dry season is cool and mostly clear. The monthly rainfall in the project region varies greatly depending on the season. The monthly rainfall in the project region varies greatly depending on the season. The average annual rainfall ranges from 601 to 800mm, with January having the greatest rain and July receiving little to none. Figure 21 shows the monthly rainfall and evaporation for the project area, whereas Figure 20 shows the mean yearly rainfall.

Table 12: Monthly minimum, maximum and average temperatures for January 2016 - December 2018.

MONTHLY MINIMUM, MAXIMUM AND AVERAGE TEMPERATURES (°C) 2016 – 2018												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Minimum	8.8	10.8	8.6	5.6	3.2	1.6	0.1	1.1	3.6	3.1	5.0	9.4
Maximum	30.5	29.4	27.8	27.1	21.2	19.4	19.0	23.1	27.2	30.2	30.0	32.0
Average	19.2	19.4	18.8	16.3	12.2	10.2	9.4	12.1	15.8	16.1	18.0	20.0

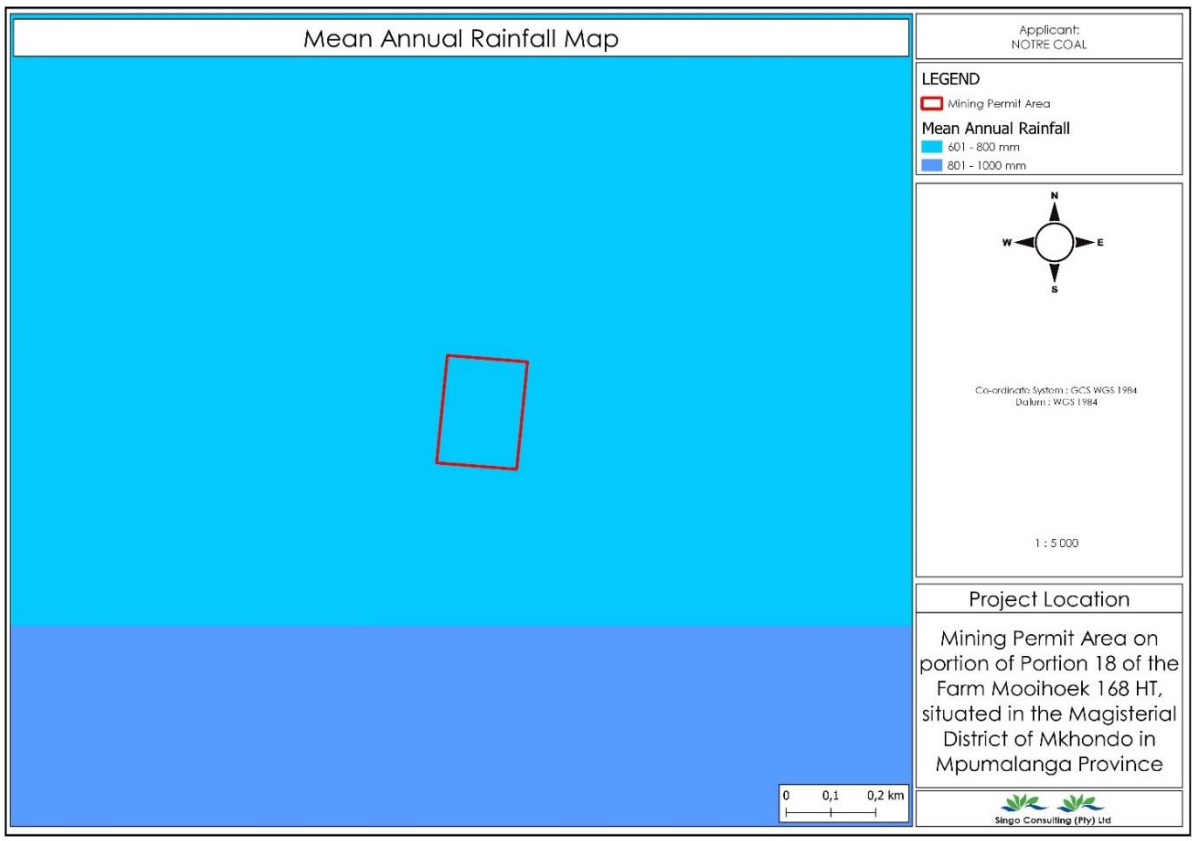


Figure 20: Mean annual Rainfall for the project area (Singo Consulting GIS Team, 2022)

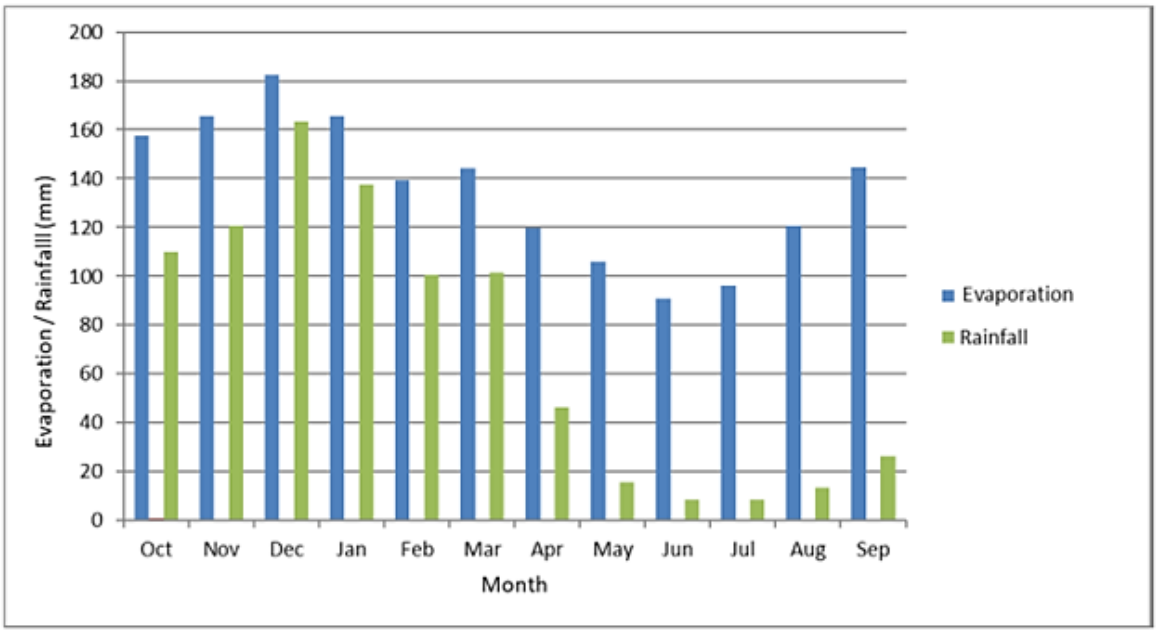


Figure 21: Monthly rainfall and evaporation, from saws station W5E009.

8.6.3 Wind

From January 2016 to December 2018, the prevailing wind direction was 13.8 percent west and 11% east-northeast; wind speeds with calm circumstances were usually moderate to high, as illustrated in Figure 22.

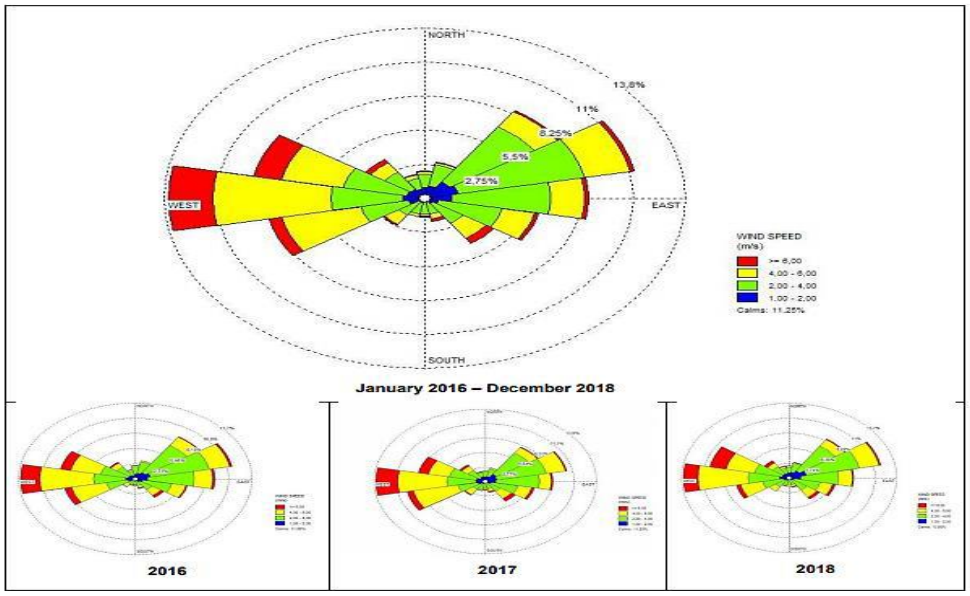


Figure 22: Windrose data from Jan 2016-Dec 2018

8.7 Environmental Sensitivity

Table 13 summarises the environmental sensitivities identified for the proposed project. These sensitivities are indicative only and must be verified on-site by a suitably qualified person before the specialist assessments identified can be confirmed.

Table 13: Proposed mining permit area environmental sensitivity.

Theme	Very high sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture		X		
Animal species		X		
Aquatic biodiversity	X			
Archaeological and cultural heritage				X
Civil aviation				X
Defence				X
Palaeontology	X			
Plant species			X	
Terrestrial biodiversity	X			

8.8 Catchment and Water Management Area

South Africa's water resources are divided into quaternary catchments, which are the country's primary water management units (DWAF 2011). In a hierarchical classification system, a quaternary catchment is a fourth order catchment below the primary catchments. The primary drainages are further classified as Water Management Areas (WMA) and Catchment Management Agencies (CMA). In accordance with Section 5 subsection 5(1) of the National Water Act, 1998, the Department of Water and Sanitation (DWS) has established nine WMAs and nine CMAs as outlined in the National Water Resource Strategy 2 (2013). (Act No. 36 of 1998). The purpose of establishing these WMAs and CMAs is to improve water governance in various regions of the country, ensuring a fair and equal distribution of the Nation's water resources while ensuring resource quality is maintained.

The prospecting area falls within the Inkomati-Usuthu Water Management Area (WMA). The quaternary catchment is the W51C. The WRC 2012 study, presents hydrological parameters for each quaternary catchment including area, mean annual precipitation (MAP) and mean annual runoff (MAR).

Quaternary Catchment	Water Management Area	S-Pan Evaporation		Rainfall		Catchment Area
		Evaporation Zone	MAE (mm)	Rainfall Zone	MAP (mm)	
W51C	Inkomati-Usuthu	13A	1400	W5A	903	678

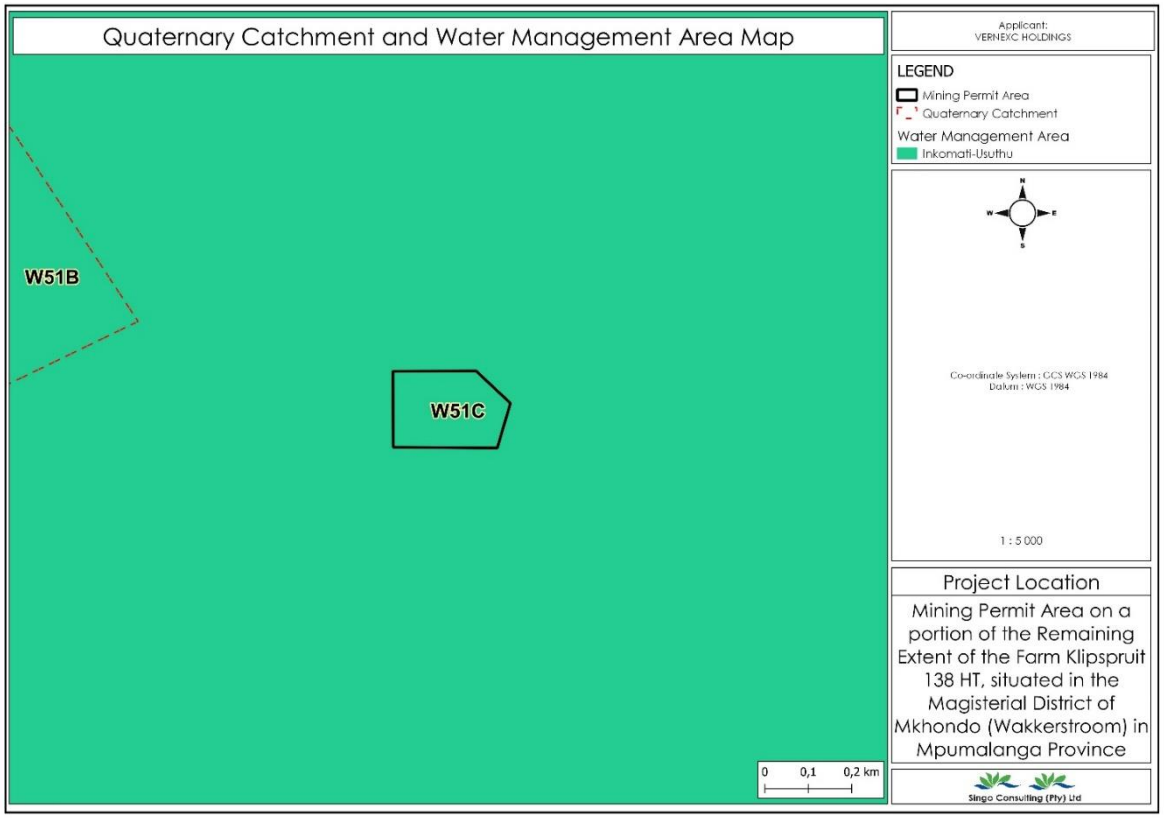


Figure 23: Quaternary Catchment and Water Management Areas (Singo Consulting GIS Team, 2022)

A Topographic map is a map which indicates, to scale, the natural features of the Earth's surface, as well as human features, with features at the correct relationship to each other (Oxford Dictionary; 2020). The topography map other than showing landform features, rivers, and associated water resources, it also shows the height above sea level with the use of contour lines. Contour lines are an Imaginary line on the ground surface joining the points of equal elevation, with the vertical distance or a difference in elevation between contour lines in a topographic map known as contour interval. The topographic map in **Error! Reference s ource not found.** 24 indicates a 20m contour interval.

In this environmental project, topography is used to determine how surface water flows during rainy seasons or how it would flow during the existence of the project. The topography also influences groundwater vulnerability, as topography also influences run-off and infiltration rate by means of residence time.

From the data collected from the hydrology and topology map illustrated by the QGIS below (figure 24), the google earth search and site inspection conducted on the 16th of November 2022, it was verified that no waterbody is situated within the project area (portion of remaining extent of the farm Klipspruit 138 HT). However, a dam and a seep wetland were observed situated approximately 600m away on the northeastern side of the mining permit area, and a perennial river situated approximately 1 km away on the Southeastern side of the project area.

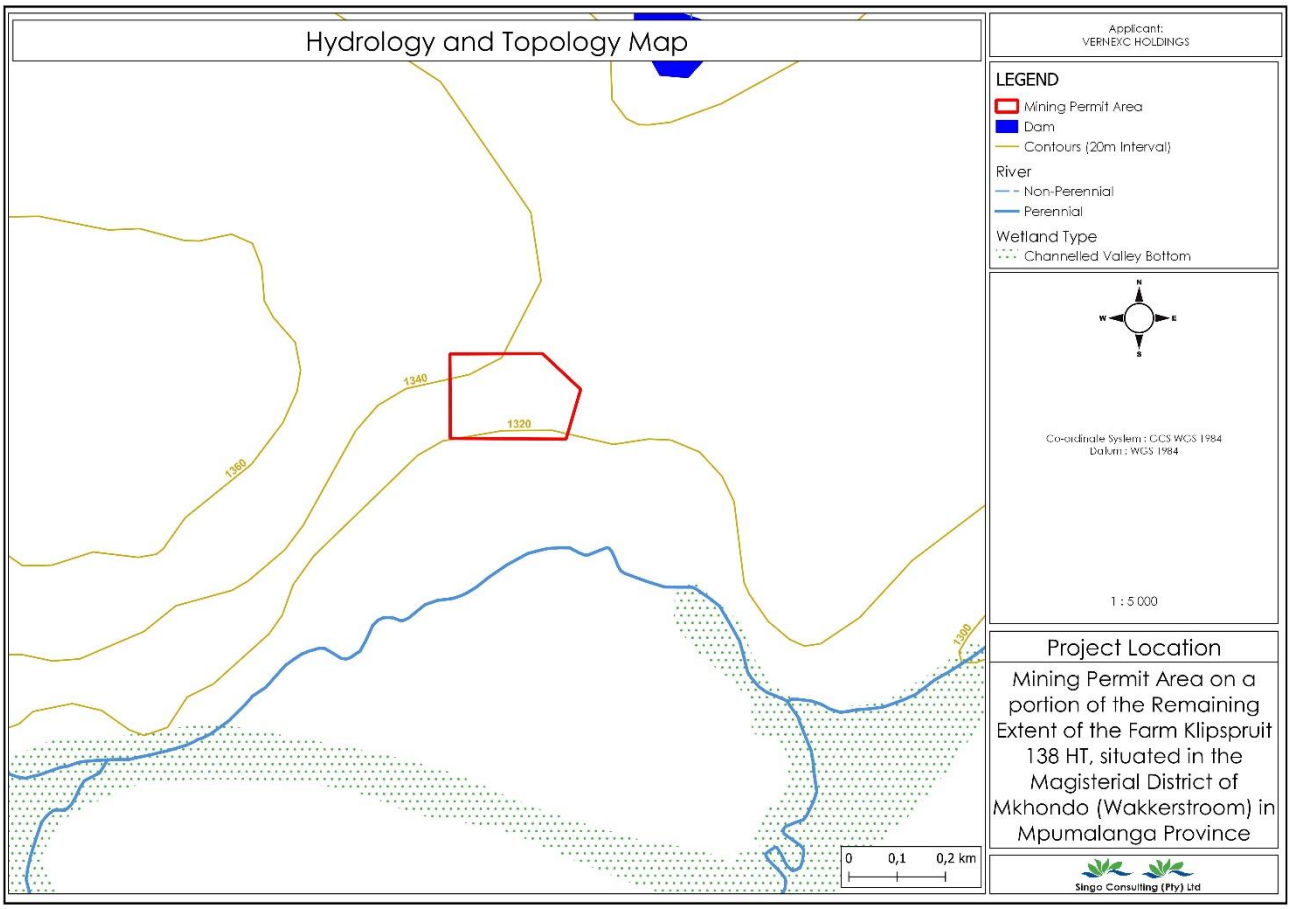


Figure 24: Hydrology & topology map of the proposed project area (Singo Consulting GIS Team, 2022)

8.11 Biodiversity

According to the terrestrial biodiversity map produced by GIS specialist, it shows that the proposed area falls within Heavily Modified. Heavily modified are transferred areas, where biodiversity and ecological function have been lost to the point that they are not worth considering for conservation at all.

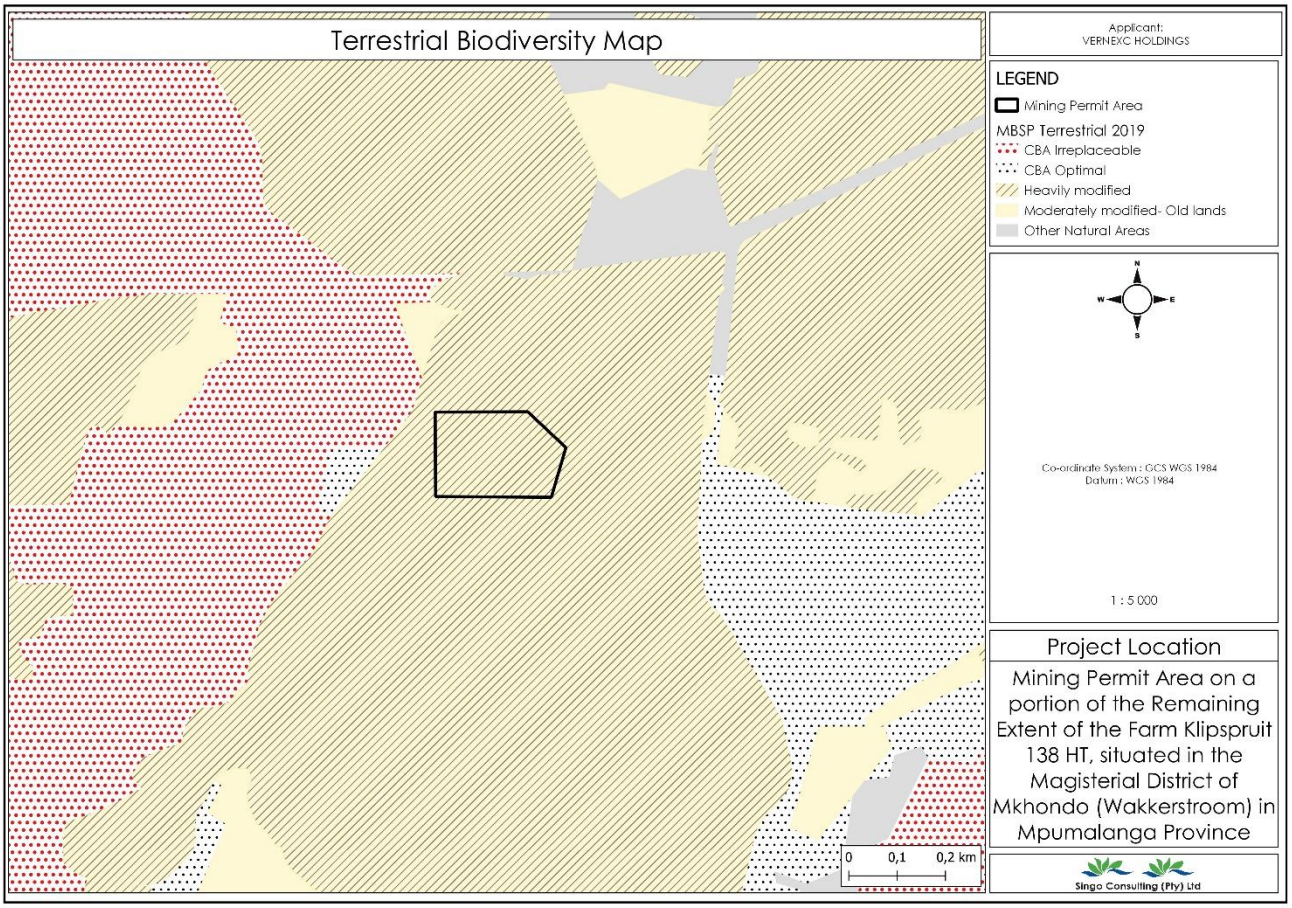


Figure 25: Terrestrial biodiversity

8.12 Site Vegetation

The vegetation of the proposed project area is dominated by Northeastern Mountain Grassland (see Figure 27). The grassland is dominated by Indigofera Hybrida. The distribution of this vegetation is controlled by rainfall on the cold, frosty, eastern Mpumalanga highveld together with sandy soils. It is generally very suitable for crop production while areas of natural vegetation are heavily grazed by cattle.

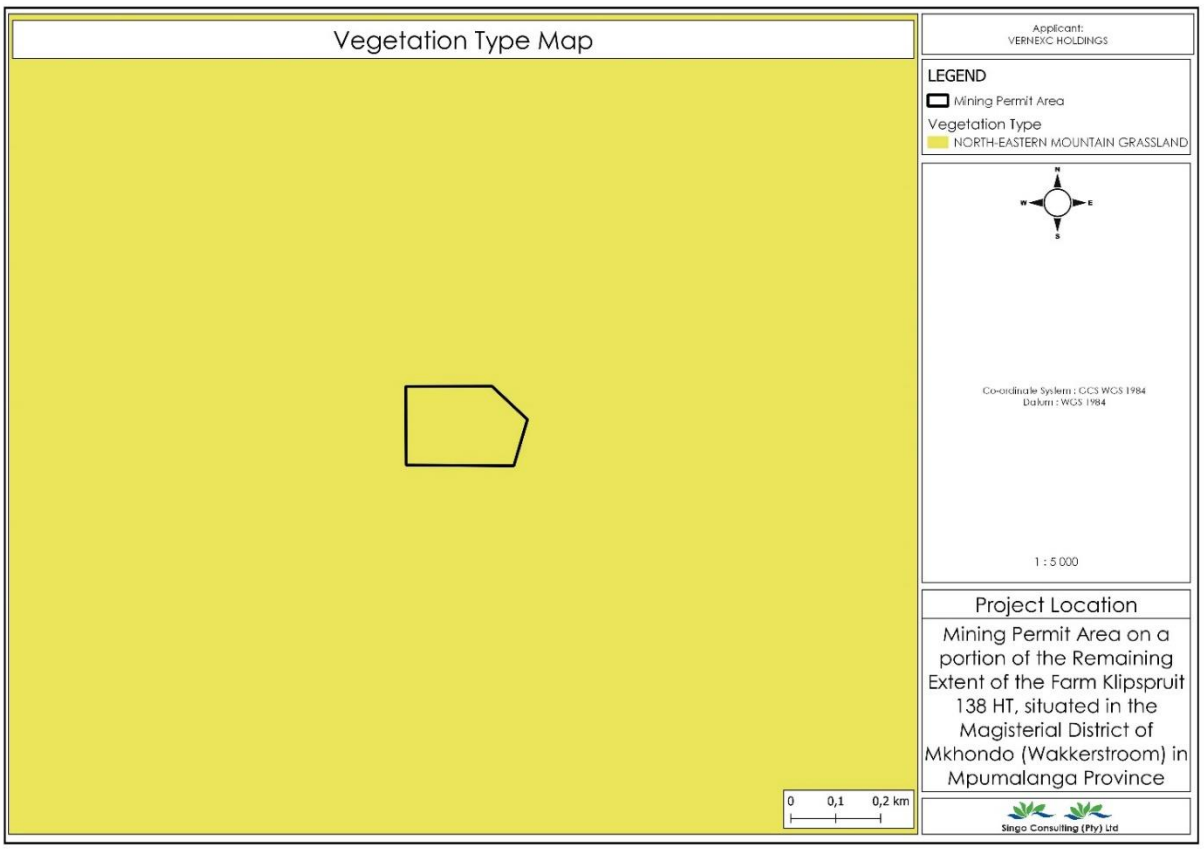


Figure 26: Vegetation type map of the proposed project area (Singo Consulting GIS Team, 2022)

The screening report shows that the proposed project area is of medium sensitivity with the following plant species:

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Sensitive species 1252
Medium	Melanospermum italae
Medium	Sensitive species 1003
Medium	Sensitive species 41
Medium	Sensitive species 691
Medium	Sensitive species 998
Medium	Sensitive species 1152
Medium	Sensitive species 313
Medium	Gerbera aurantiaca

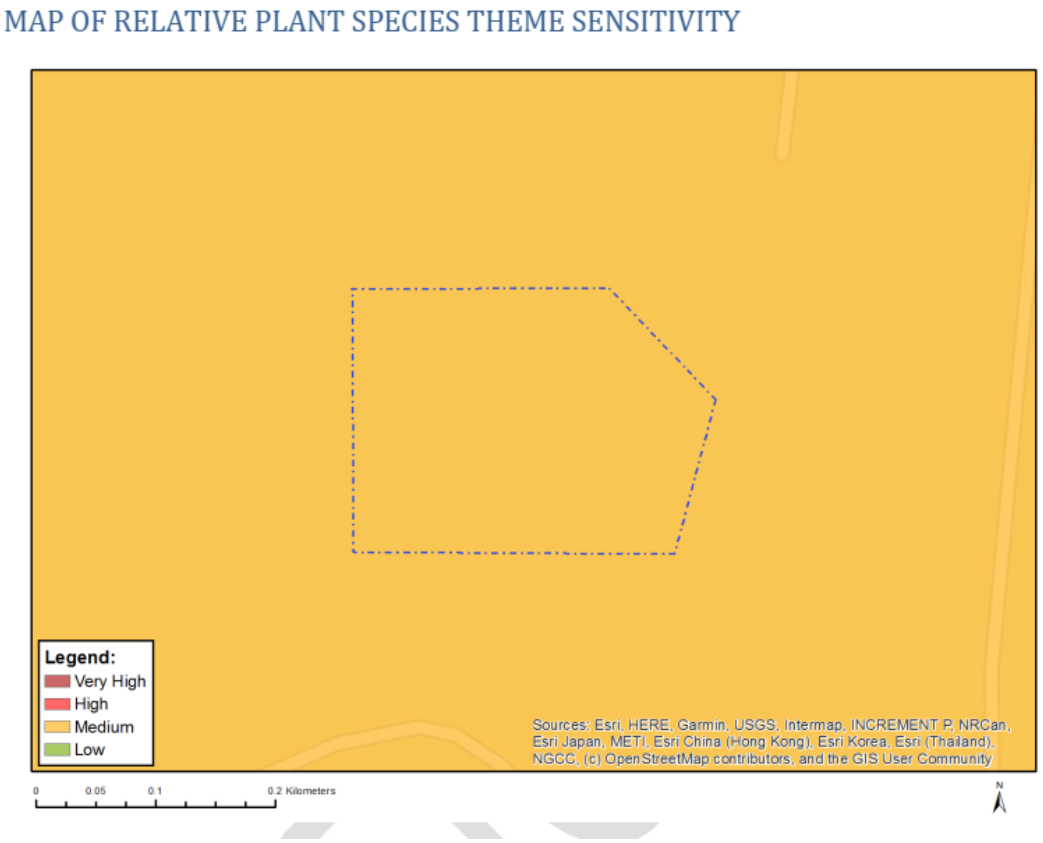


Figure 27: Map of relative plant species theme sensitivity (source, screening report)

Figure 28: vegetation found during site assessment

8.13 Mammals

During the desktop study, no red data mammal species were found on the proposed site and during site assessment, cow's skin was observed on site and cows were observed within 2 km off site. The screening report shows that the proposed project area is of medium sensitivity with the following mammal species:

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Geronticus calvus
Medium	Mammalia-Chrysospalax villosus
Medium	Mammalia-Ourebia ourebi ourebi
Medium	Invertebrate-Clonia lalandei
Medium	Invertebrate-Doratogonus praealtus

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY

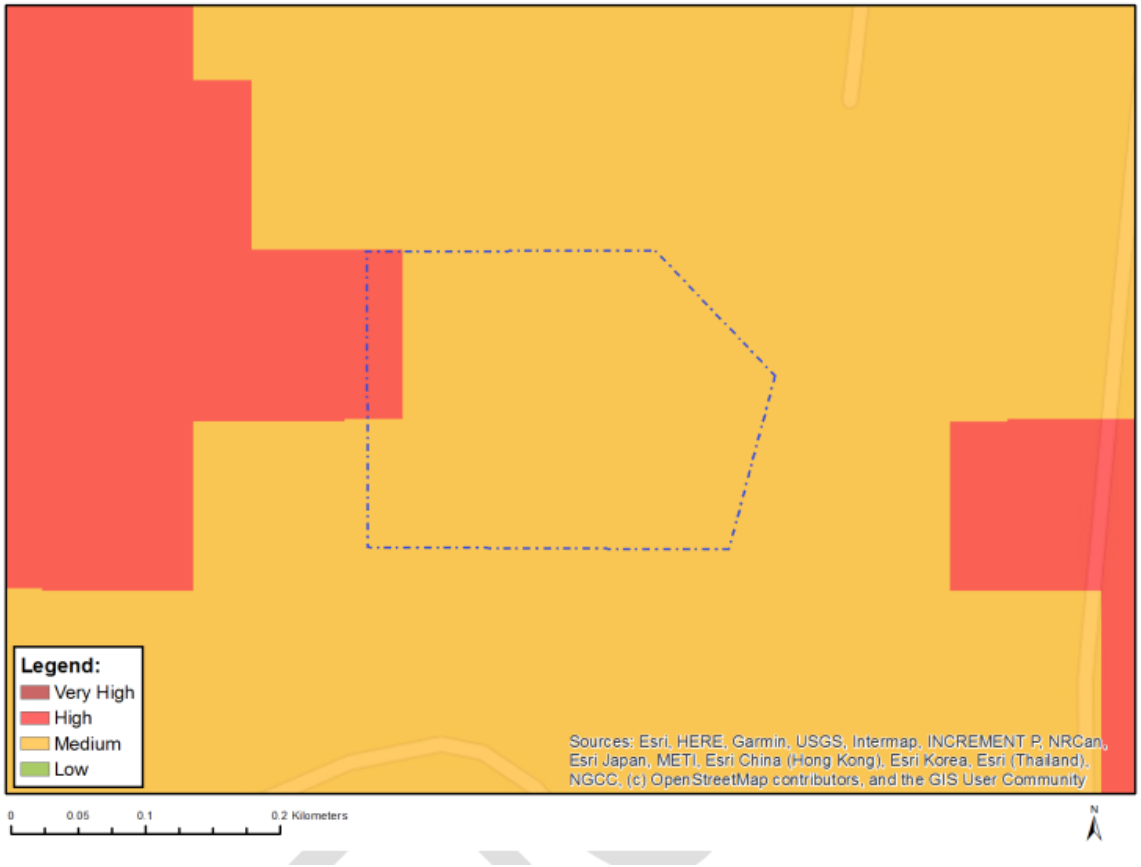


Figure 29: Map of relative animal species theme sensitivity (source, screening report)


Birds

Birds are considered good ecological indicators, since their presence or absence indicate whether the ecosystem is functioning properly or not. Bird communities and ecological condition are linked to land cover, as the types of bird species in the area change when land cover changes. Habitat-specific species are sensitive to environmental change, with habitat destruction being the leading cause of species decline worldwide. It is widely accepted that vegetation structure, rather than the actual plant species, influences bird species distribution and abundance (Harrison et al., 1997).

Table 14: Loss of vegetation and natural habitat during mining

Impact phase	Mining phase				
Possible impact	Loss of vegetation and natural habitat				
Type of impact	Direct and indirect impact				
Rating criteria	**Extent**	**Duration**	**Magnitude**	**Probability**	**Significance**
Calculation	3	5	8	4	High (61-90)
Can the impact be reversed					No
Will impact cause irreplaceable loss of resources					Yes
Can impact be avoided, managed, or mitigated					Yes
Impact mitigation measures • Limit vegetation clearing to what is necessary for mining activities. • Carry out a pre-vegetation clearing walk to identify SCC which might be present onsite. • Prioritise development in low sensitive/already disturbed areas.					

• Offer environmental awareness and training before mining commences. • Implement a biodiversity action plan prior to mining and ensure adherence thereto. • Fence-off mining site to demark working extent and prevent mining impacts on biodiversity. • Minimise areas affected during mining and establish buffer zones. • Use available farm roads to avoid unnecessary disturbance of natural and indigenous vegetation. • Supervise (to be done by an ecologist) the rescue operation to ensure its success. • Disturbed areas must be rehabilitated with indigenous plants as soon as mining concludes.

Table 15: Introduction of alien invasive species during rehabilitation.

Impact phase	Rehabilitation phase after mining activities				
Possible impact	Introduction of alien invasive species				
Type of impact	Direct and indirect impact				
Rating criteria	**Extent**	**Duration**	**Magnitude**	**Probability**	**Significance**
Calculation	2	5	8	4	Medium (30-60)
Can the impact be reversed					No
Will impact cause irreplaceable loss of resources					Yes
Can impact be avoided, managed, or mitigated					Yes
Impact mitigation measures • Establish buffer zones and implement strict measures to prevent mining in these zones. Do not clear vegetation in buffer zones. • The best mitigation measure for alien and invasive species is early detection and eradication of these species using a monitoring programme. • An alien invasive management programme should be developed and implemented to control alien invasive species. • Disturbed area should be rehabilitated with indigenous plant species to avoid colonisation of the area by invasive species.					

Table 16: Impacts of mining on birds and its associated roosting site.

Impact phase	Mining phase				
Possible impact	The fragmentation, clearing, and alteration of natural habitat have a huge impact on birds breeding and roosting sites.				
Type of impact	Direct Impact				
Rating criteria	**Extent**	**Duration**	**Magnitude**	**Probability**	**Significance**

Calculation	3	5	8	4	High (61-90)
Can the impact be reversed					No
Will impact cause irreplaceable loss of resources					Yes
Can impact be avoided, managed, or mitigated					Yes
Impact mitigation measures • Ensure that there is no-alteration of vegetation patches that will provide space for breeding and roosting site for birds. • Ensure that there is no disturbance to bird species, nests, breeding sites if identified and create artificial site for birds. • Prohibit activities like trapping, hunting, and killing of birds onsite during mining. • ECO to conduct regular site inspections and remove any snares erected onsite. • A conservation-orientated plan should be developed personally for contractors so that there will be a penalty clause for non-compliance.					

Table 17: Loss of mammals due to mining.

Impact phase	Mining phase				
Possible impact	Loss of mammals due to habitat fragmentation and degradation				
Type of impact	Direct Impact				
Rating criteria	**Extent**	**Duration**	**Magnitude**	**Probability**	**Significance**
Calculation	3	5	8	4	High (61-90)
Can the impact be reversed					No
Will impact cause irreplaceable loss of resources					Yes
Can impact be avoided, managed, or mitigated					Yes
Impact mitigation measures • Pre-mining walk to be carried out onsite to ensure the absence of mammal habitats. • Hunting weapons are prohibited onsite. • Dogs are prohibited on the worksite as they are threats to wild animals. • A low-speed limit should be enforced onsite to reduce animal-vehicle collisions • No animals should be intentionally killed/poached if identified, and hunting is not permitted on site. • Relocate any threatened mammal species identified before commencement of mining. • Offer environmental induction for all employees to raise awareness on the value of wild animals (if identified) and the importance of their conservation. • ECO to conduct regular site inspections and remove any traps erected onsite.					

- Contractual fines to be imposed and contract employees to be immediately dismissed if found attempting to snare or otherwise harm faunal species identified.
- Ensure that sensitive mammal habitats like drainage lines and wetlands area avoided.

Table 18: Impacts of the mining on sensitive areas

Impact phase	Mining phase				
Possible impact	Destruction of streams and wetlands and its associated vegetation				
Type of impact	Direct Impact				
Rating criteria	Extent	Duration	Magnitude	Probability	Significance
Calculation	3	5	8	5	High (61-90)
Can the impact be reversed					No
Will impact cause irreplaceable loss of resources					Yes
Can impact be avoided, managed, or mitigated					Yes
Impact mitigation measures • No disturbance in drainage lines, rivers, and wetlands, including mining across wetlands and rivers, fill dumping, road construction, and all forms of temporary disturbance. • Storm water and erosion control measures to be implemented and monitored as per EMPr to prevent siltation or erosion of sensitive environment identified onsite. • Do not lower the original stream bed/profile of the wetland, as this may result in scouring in an upstream direction and further alteration of bed conditions. • Prioritise development in low sensitive/already disturbed areas. • Immediately and appropriately clean any accidental chemical, fuel, and oil spill from machines. • Store all materials appropriately to prevent contamination of sensitive sites.					

7.14 Graves, heritage, archaeological and cultural resources.

The study serves to inform and guide the proponent and contractors about the potential impacts that the proposed mining development may have on heritage resources (if any) located in the study area. In addition, the document aims to inform the Mpumalanga Province Heritage Resource Agency (MPHRA) and the South African Heritage Resource Agency (SAHRA) Burial Ground and Graves Unit about the presence, absence and significance of heritage resources that may be located within the proposed mining permit application site. During site assessment, graves were not observed on site.

7.15 Access Road

The national roads are relatively far from the project area. The project area is easily accessible by an unnamed road from the R543 road to KwaNgema. The unnamed road connecting from the R543 to the project area is in reasonable condition.

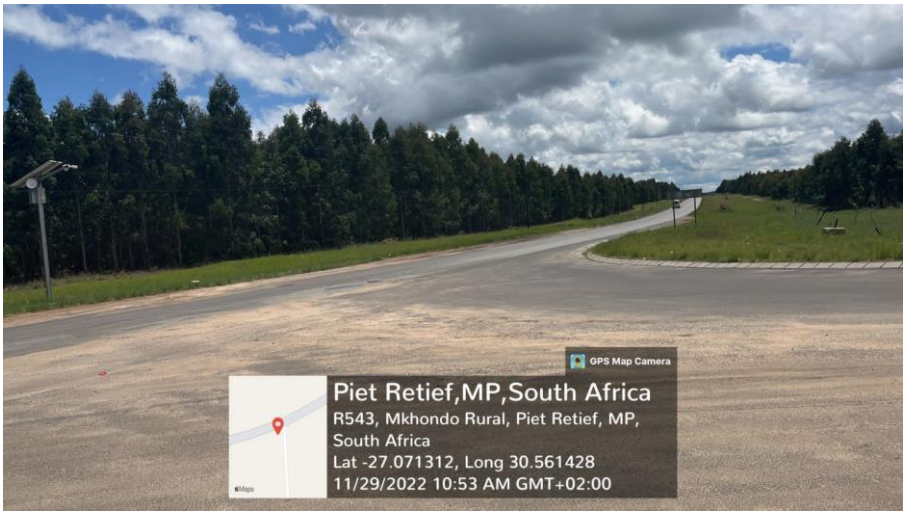


Figure 30: R543

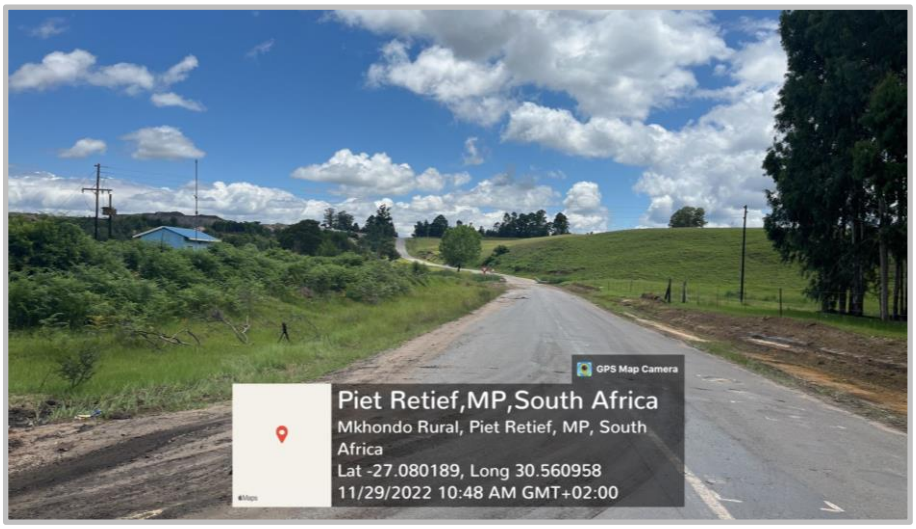


Figure 31: unnamed road connecting to R543

7.16 Description of current land uses

The current land uses within 3 km:

- Watercourses
- Residential
- Access roads
- Open cast mine
- Cattle grazing

8 IMPACTS AND RISKS IDENTIFIED

Impacts and risks were identified based on the proposed mining activities to take place on-site. Table 19 lists the potential impacts related to each of the significant activities related to the small-scale mining operation.

Table 19: List of potential impacts per activity.

Aspect	Main Activity/Action/Process	Impact
Social	Site establishment	Safety and security risks to landowners and lawful occupiers
Social	Site establishment	Interference with existing land uses
Social	Site establishment	Sense of place
Social	Site establishment	Safety and security risks to landowners and lawful occupiers
Social	Site establishment	Interference with existing land uses
Social	Site establishment	Sense of place
Social	General mine management	Crime and violence
Social	General mine management	Influx of migrant workers
Social	General mine management	Sense of place
Social	General mine management	Social vices
Socio-economic	Opencast mining	Coal supply
Socio-economic	Opencast mining	Economic growth
Socio-economic	Opencast mining	Education, skills development and training
Socio-economic	Opencast mining	Employment opportunity
Health & safety	Maintenance and operation of site infrastructure and facilities	Fire and explosion hazard
Health & safety	Opencast mining	Fly rock
Health & safety	Opencast mining	Health impacts
Land capability	Maintenance and operation of site	Loss of soil fertility, soil resource and its utilisation potential

Aspect	Main Activity/Action/Process	Impact
Land use	Opencast mining	Damage/Disruption of services (such as water and power supply, etc.)
Land use	Opencast mining	Interference with existing land uses
Soil	Opencast mining	Soil compaction
Soil	Opencast mining	Soil pollution/contamination
Soil	Opencast mining	Erosion and sedimentation
Topography and landform	Opencast mining	Alteration of topography
Topography and landform	Opencast mining	Altered drainage patterns
Transportation, infrastructure & traffic	Opencast mining	Soil surface subsidence
Transportation, infrastructure and traffic	Opencast mining	Damage to infrastructure
Transportation, infrastructure and traffic	Opencast mining	Increased traffic
Visual	Opencast mining	Visual impact of mine infrastructure, stockpiles and dust
Air quality	Opencast mining	Fugitive emissions (dust)
Blasting & vibration	Opencast mining	Air blast
Blasting & vibration	Opencast mining	Ground vibration and human perception
Blasting & vibration	Opencast mining	Impact on infrastructure
Blasting & vibration	Opencast mining	Noxious fumes
Noise	Opencast mining	Disturbing and/or nuisance noise
Fauna & flora	Opencast mining	Direct and indirect mortality of flora and fauna

Aspect	Main Activity/Action/Process	Impact
Fauna & flora	Opencast mining	Habitat fragmentation and blockage of seasonal and dispersal movements
Fauna & flora	Opencast mining	Introduction/invasion by alien (non-native) species
Surface water	Opencast mining	Pollution of surface water resources/decreased water quality
Surface water	Opencast mining	Decrease in surface water availability
Ground water	Opencast mining	Pollution of groundwater
Heritage	Opencast mining	Discovery and preservation of fossils
Heritage	Opencast mining	Destruction/damage of palaeontological resources
Heritage	Opencast mining	Destruction/damage of heritage resources
Geology	Opencast mining	Impact on geology
Environmental pollution	Opencast mining	General environmental pollution
Environmental pollution	Opencast mining	Hydrocarbon spills/contamination
Environmental pollution	Opencast mining	Sewage spills/contamination

Each of the identified risks and impacts for these phases was assessed utilising the assessment methodology described in Section 10.1. The assessment criteria include the nature, extent, duration, magnitude/intensity, reversibility, probability, public response, cumulative impact and irreplaceable loss of resources. The full scoring of each impact is provided and a summary of the impacts and their significance before and after mitigation is provided in Section 32.

In order to calculate the significance of an impact, probability, duration, extent and magnitude will be used. The pre- and post- mitigation scores will provide an indication of the extent to which an impact can be mitigated.

8.1 The Impact Assessment Methodology

The subsections below present the approach to assessing the identified potential environmental impact with the aim of determining the relevant environmental significance.

8.1.1 Method of Assessing Impacts

The impact assessment methodology is guided by the requirements of the NEMA 2014 EIA Regulations (as amended). The broad approach to the significance rating methodology is to determine the Environmental Risk (ER) by considering the Consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the Probability/likelihood (P) of the impact occurring. This determines the Environmental Risk. In addition, other factors, including cumulative impacts, public concern, and potential for irreplaceable loss of resources are used to determine a Prioritisation Factor (PF) which is applied to the ER to determine the overall Significance (S).

8.1.2 Determination of Environmental Risk

The significance (S) of an impact is determined by applying a Prioritisation Factor (PF) to the Environmental Risk (ER).

The Environmental Risk is dependent on the Consequence (C) of the particular impact and the Probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M) and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the Consequence of the impact is represented by:

$$C = \frac{(E+D+M+R) \times N}{4}$$

Each individual aspect in the determination of the Consequence is represented by a rating scale as defined in Table 20.

Table 20: Criteria for determination of impact Consequence.

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)

	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way)
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease) or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease)
Reversibility	1	Impact is reversible without any time and cost
	2	Impact is reversible without incurring significant time and cost
	3	Impact is reversible only by incurring significant time and cost
	4	Impact is reversible only by incurring prohibitively high time and cost

Once the C has been determined the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/scored as per Table 21.

Table 21: Probability scoring.

		Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions;<25%),
		Low probability (there is a possibility that the impact will occur; >25% and <50%),
		Medium probability (the impact may occur; >50% and <75%),
		High probability (it is most likely that the impact will occur- > 75% probability), or
		Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows (Table 22).

$$ER = C \times P$$

Table 22: Determination of Environmental Risk.

Consequence						
	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	Probability					

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 23.

Table 23: Significance classes.

Environmental Risk Score	
Value	Description
< 10	Low (i.e. where this impact is unlikely to be a significant environmental risk),
≥ 10; < 20	Medium (i.e. where the impact could have a significant environmental risk),
≥ 20	High (i.e. where the impact will have a significant environmental risk).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre- mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/ mitigated.

8.1.3 Impact Prioritization

In accordance with the requirements of Appendix 3(1)(j) of the NEMA 2014 EIA Regulations (as amended) (GNR 326 of 2017), and further to the assessment criteria presented in the Section above, it is necessary to assess each potentially significant impact in terms of cumulative impacts and the degree to which the impact may cause irreplaceable loss of resources.

In addition, it is important that the public opinion and sentiment regarding a prospective development and consequent potential impacts is considered in the decision-making process.

In an effort to ensure that these factors are considered, an impact Prioritisation Factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/ significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/ mitigation impacts are implemented Table 24.

Table 24: Criteria for the determination of prioritisation.

Public response (PR)	Low (1)	Issue not raised in public response.
	Medium (2)	Issue has received a meaningful and justifiable public response.
	High (3)	Issue has received an intense meaningful and justifiable public response.
Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal

		cumulative change.
Irreplaceable loss of resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criterion. The impact priority is therefore determined as follows:

$$\text{Priority} = PR + CI + LR$$

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 2 Table 25.

Table 25: Determination of prioritization factor.

Priority	Ranking	Prioritization Factor
3	Low	1
4	Medium	1.17
5	Medium	1.33
6	Medium	1.5
7	Medium	1.67
8	Medium	1.83
9	High	2

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is to be able to increase the post mitigation environmental risk rating by a full ranking class, if all the priority attributes are high (i.e. if an impact comes out with a medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential, significant public response, and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance (Table 26).

Table 26: Environmental significance rating.

Environmental Significance Rating	
Value	Description
< -10	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥ -10 < -20	Medium negative (i.e. where the impact could influence the decision to develop in the area).
≥ -20	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
0	No impact
< 10	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥ 10 < 20	Medium positive (i.e. where the impact could influence the decision to develop in the area).
≥ 20	High positive (i.e. where the impact must have an influence on the decision process to develop in the area)

8.2 Assessment and Evaluation of Potential Project Impacts and Mitigation Measures

The following potential impacts were identified during the Basic Assessment. Mitigation measures have also been provided for each environmental aspect assessed. The draft BAR & EMPR was made available to I&APs for review and comment and their comments and concerns were addressed in this final report that is submitted to the DMRE for decision-making. The results of the public consultation were utilised to update the impact scores upon completion of the public review period.

8.2.1 Topography and Landform

Topography refers to the surface shape and features of an area. Opencast operations will remove surface material to access and mine coal and this can alter the natural topography of the site. Resultant changes to the topography can in turn impact on groundwater, surface water drainage, visual character and the safety of both people and animals if not properly mitigated. If mining extraction techniques are not carried out correctly, lack of support from underlying layers could cause the surface soil profile to vertically subside to a greater or lesser degree. This could result in limitations to the viability of potential post mining land uses.

Impacts on the topography and landform within the application area are expected to occur as follows:

- Alteration of topography.
- Altered drainage patterns.
- Soil surface subsidence.

8.2.1.1 Significance of Impacts

The above impacts on topography and landform will be negative but site specific. With mitigation, the impact can be controlled but not prevented and will remain low to moderate in significance.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance
Alteration of topography	-15,00	-13,75	-13,75
Altered drainage patterns	-11,00	-5,00	-5,00
Soil surface subsidence	-10,00	-4,00	-4,67

The following mitigation types are associated with potential impacts on topography and landform:

- Control through site planning and design.
- Control through proper soil management procedures.
- Avoidance through mine design and planning (depth of mining, safety factors, overburden and rock qualities).

8.2.2 Impact on Geology

Geology refers to the underlying mineral structure of an area. Alterations to the natural geology could have impacts on other aspects such as groundwater and topography. Mining operations will remove the coal layer which will alter the geology of the site. Resultant changes to the geology can in turn impact on groundwater, soil forms, and paleontological resources. Mining will have a permanent impact on the geology of the application area.

8.2.2.1 Significance of Impact

The impact on the local geology is permanent as an entire orebody and stratigraphic unit will be removed during the mining operations. There are no mitigation measures to reduce the impact on geology as the removal of a geological unit is the goal of the activity. The impact will remain high.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Impact on Geology	-14,00	-18,75	-25,00

The following mitigation types are associated with potential impacts on the geology:

- Control through site planning and design.
- Control through proper soil management procedures.
- Avoidance through mine design and planning (depth of mining, safety factors, overburden and rock qualities).

8.2.3 Impacts on Soil.

Mining operations have the potential to damage soil resources 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. Due to the increased activity of trucks and heavy machinery the possibility of soil contamination by leaking oils and fuels is increased. The contamination of soils may contribute to the contamination of surface and groundwater resources. Increased soil erosion can be caused by a loss in vegetative cover resulting in increased water runoff. This is especially likely to occur on sloping terrain. Impacts on soil structure can result in changes to soil drainage, increasing runoff and erosion, and may also result in further potential knock on effects impacting on surface and underground water resources. Loss of the topsoil resource reduces chances of successful rehabilitation and restoration.

Impacts on soil resources are expected to occur as follows:

- Erosion and sedimentation.
- Soil compaction.
- Soil pollution/contamination.

8.2.3.1 Significance of Impacts

The above impacts on soil resources will be negative but site specific. With mitigation, the impact can be controlled but not prevented and will remain low to moderate in significance.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Erosion and sedimentation	-11,00	-5,50	-7,33
Soil compaction	-11,00	-7,50	-10,00
Soil pollution/contamination	-11,00	-5,50	-7,33

The following mitigation types have been associated with potential impacts on soil:

- Avoid and control through preventative measures (soil placement, storm water infrastructure, erosion control structures).
- Avoid through implementation of EMPR mitigation measures
- Remedy through application of treatment measures (e.g. ripping).
- Avoid through preventative measures (e.g. bunding, spill kits).

- Remedy through clean-up and waste disposal.
- Modify through soil treatment if required.

8.2.4 Impacts on Land Capability

Land capability is closely linked to the soil. Mining operations have the potential to significantly transform the land capability, often irreparably. The types of impacts related to land capability involve post mining compaction, loss of fertility, impeded soil drainage and insufficient depth of the replaced soil. In many cases, mining may result in the land capability class changing from arable to grazing post closure. The loss of potentially productive agricultural land, along with a reduction in land capability may occur as a result of site sterilisation due to mining activities. Some impacts such as acidification and loss of original soil depth and volume can be permanent and will reduce the capability post closure.

Impacts on land capability are expected to occur as follows:

- Loss of soil fertility (denitrification, loss of soil nutrient store and organic carbon stores) and loss of land capability.
- Loss of soil resource and its utilisation potential.
- The land will be transformed to arable land after a successful rehabilitation.

8.2.4.1 Significance of Impacts

The above impacts on land capability will be negative but site specific. They are long term impacts and are expected to last for the duration of the life of the mine and in some cases the disturbance will be permanent. With mitigation, the impact can be controlled but not prevented and some impacts will be permanent.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Loss of soil fertility (denitrification, Loss of soil nutrient store and organic carbon stores) and loss of land capability	-12,00	-11,00	-12,83
Loss of soil resource and its utilisation potential	-12,00	-11,00	-12,83

The following mitigation types are associated with potential impacts on land capability:

- Avoid through preventative measures (e.g. limit area of disturbance).
- Remedy through soil remediation if required (e.g. fertilizer and organic matter applications)

8.2.5 Impacts on Land Use

The predominant land use in the surrounding area is grassland. Mining activities have the potential to affect land uses within the application area and in the surrounding areas. This can be caused by physical transformation of land through direct or indirect impacts. Impacts may be related to factors such as loss of soil, loss of biodiversity, pollution of water, dewatering, air pollution, noise pollution, and damage/destruction from blasting. The nature of opencast mining is such that it is unlikely that mining and other land uses can coexist. This means that any area utilised for opencast mining will be unavailable for other land uses.

Impacts on land use are expected to occur as follows:

- Damage/Disruption of services (such as water and power supply, etc.).
- Interference with existing land uses.

8.2.5.1 Significance of Impacts

The above impacts on land use will be negative but site specific. With mitigation, the impact can be controlled but not prevented and will remain low in significance.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Damage/Disruption of services (such as water and power supply, etc.)	-9,00	-5,00	-5,00
Interference with existing land uses.	-9,75	-7,50	-8,75

The following mitigation types have been associated with potential impacts on land use:

- Avoid through implementation of EMPR mitigation measures (e.g. service detection and communication with landowners).
- Remedy through repair or reinstatement of services if required.

8.2.6 Impacts on Fauna and Flora

The mining activities and the establishment of the supporting infrastructure have the potential to result in loss of vegetation, habitat disruption, loss of ecosystem functionality, habitat transformation, spread of alien invasive species, a reduction in overall biodiversity, increased hunting of animals, the introduction of new species to the site and disruption of migration routes.

Mining and associated activities may result in the removal and destruction of primary vegetation communities. These communities may be in threat categories according to NEMBA or important according to the Mpumalanga C-Plan.

Disturbances to the site may result in an increase of invasive species on site and on downstream and adjacent properties. Increased erosion may alter the drivers that affect wetland vegetation. Several

pollutants associated with mining activities including oil, concrete and dust have the potential to inhibit plant growth and germination and could potentially result in plant mortality. Mining alters the movement of water through the landscape, potentially affecting the hydrological flow regime which is the main driver of natural vegetation.

Threatened animal species are affected primarily by the overall loss of habitat, as direct mining impacts on individuals can often be avoided due to movement of individuals from the area of disturbance. Direct impacts during mining activities are unlikely to have an impact on individual animals of concern, as most are highly mobile and will move out of the area. During operation, birds could potentially suffer mortality due to collisions with vertical infrastructure, especially infrastructure with low visibility, such as powerlines.

Impacts on fauna and flora are expected to occur as follows:

- Direct and indirect mortality of flora and fauna.
- Habitat fragmentation and blockage of seasonal and dispersal movements.
- Introduction/invasion by alien (non-native) species.

8.2.6.1 Significance of Impacts

The above impacts fauna and flora will be negative for the duration of the Mining Permit period. With mitigation, the impact can be controlled but not prevented and will remain low to moderate in significance.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Direct and indirect mortality of flora and fauna	-12,00	-7,50	-8,75
Habitat fragmentation and blockage of seasonal and dispersal movements	-10,00	-6,00	-6,00
Introduction/invasion by alien (non-native) species	-6,75	-3,50	-4,08

The following mitigation types are associated with potential impacts fauna and flora:

- Control through implementation of EMPR mitigation measures (e.g. limit area of disturbance, maintaining corridors and alien vegetation management plan).
- Avoid/stop through relocation of threatened or protected species.

8.2.7 Impacts on Surface Water Resources

Mining activities have the potential to alter surface water features through actual mining methods employed as well as the placement of infrastructure. Hydrocarbon spills from diesel machinery also pose threats to local water resources. Surface infrastructure can result in the diversion of surface runoff to

storm water dams resulting in a decrease in the quantity of water entering local resources. Should surface water become contaminated it could have impacts on downstream users, resulting in affected livelihoods and supply problems.

Impacts on surface water are expected to occur as follows:

- Pollution of surface water resources/decreased water quality.
- Decrease in surface water availability.

8.2.7.1 Significance of Impacts

The above impacts on surface water will be negative and are expected to last for the duration of the Mining Permit period. With mitigation, the impact can be controlled but not prevented.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Pollution of surface water resources/decreased water quality	-8,25	-4,50	-5,25
Decrease in surface water quantity/availability	-5,50	-4,50	-5,25

The following mitigation types are associated with potential impacts on surface water resources:

- Avoid through implementation of preventative measures (e.g. bunding, hazardous materials management, pollution prevention measures and storm water management).
- Avoid and control through implementation of preventative measures (e.g. limitation of water usage, water conservation strategies, optimisation of water usage and recycling).

8.2.8 Pollution of Groundwater

Mining activities have the potential to impact on groundwater resources through potential pollution and/or contamination as a result of activities such as the actual mining method employed and resultant geological exposure of oxidising materials, seepage, spillages and both mineralised and non-mineralised waste streams.

8.2.8.1 Significance of Impact

The above impacts on groundwater will be negative and are expected to last for the duration of the Mining Permit period. Mitigation is possible and effective if implemented correctly.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Pollution of groundwater	-13,00	-6,00	-7,00

The following mitigation types have been associated with potential impacts on groundwater:

- Avoid and control through implementation of preventative measures (e.g. mine design and progressive rehabilitation).
- Avoid and control through implementation of preventative measures (e.g. bunding, hazardous materials management, Pollution prevention measures).

8.2.9 Impacts of Environmental Pollution

Environmental pollution refers to any contamination of the environment resulting from mining activities. The types of impacts related to environmental pollution include hydrocarbon spills, sewage spills, and decant from underground workings. Environmental pollution can affect surface water, groundwater, wetlands, soil resources, and air quality. Poorly designed wash bays, accidental spillages, related water facilities on site, hydrocarbon spills from heavy machinery and vehicles onsite, the removal or capping of waste products from the site, the intentional washing and rinsing of equipment, storage and use of hydrocarbons and other hazardous materials including cement, and improper waste handling, storage and disposal can all be sources of environmental pollution.

Impacts of environmental pollution are expected to occur as follows:

- General environmental pollution.
- Hydrocarbon spills/contamination.
- Sewage spills/contamination.

8.2.9.1 Significance of Impact

The above impacts of environmental pollution will be negative and are expected to last for the duration of the Mining Permit period. Mitigation is possible and effective in most cases.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
General environmental pollution	-13,00	-6,00	-7,00
Hydrocarbon spills/contamination	-10,50	-4,00	-4,67
Sewage spills/contamination	-9,00	-4,50	-5,25

The following mitigation types have been associated with potential impacts on environmental pollution:

- Avoid through implementation of suitable progressive rehabilitation and soil management.
- Control/remedy through interception of decant and treatment of polluted water where required.
- Avoid and control through implementation of EMPR mitigation measures (e.g. spill prevention, hydrocarbon storage).
- Avoid through preventative measures (e.g. bunding, spill kits).

- Remedy through clean-up and waste disposal.
- Modify through soil treatment if required.
- Avoid and control through implementation of preventative measures (e.g. location of toilets, spill prevention, waste management).

8.2.10 Impacts on Heritage Resources

An HIA/AIA study area has shown that there are graves within 400m from the project site. Mining activities such as blasting may result in damage to heritage features. The disturbance, destruction or damage of such sites requires a permit from the responsible heritage authority. If graves are to be relocated, the community will need to be engaged in a consultation process. The relocation of graves and the associated consultation process will need to be conducted by a reputable organisation. Unexpected discovery of any unidentified graves and cemeteries during the operations may also delay mining activities due to the legal processes involved.

Impacts on heritage resources are expected to occur as follows:

- Discovery and preservation of fossils.
- Destruction/damage of palaeontological resources.
- Destruction/damage of heritage resources.

8.2.10.1 Significance of Impact

If the provided mitigation measures are implemented any disturbance to heritage features can be minimised. Any destruction of heritage features is considered permanent. If the provided mitigation measures are implemented any disturbance to heritage features can be minimised.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Discovery and preservation of fossils.	-10,00	-3,50	-4,67
Destruction/damage of palaeontological resources	-11,00	-3,50	-4,67
Destruction/damage of heritage resources	-7,50	-3,00	-4,00

The following mitigation types have been associated with potential impacts on heritage resources:

- It is advised that the SAHRA/ MPHRA is alerted when work on site begins.
- Strict and clear reporting procedures for chance findings must be followed by and its contractors throughout the mining phase.
- Although the burial site was recorded outside the mining permit application site, it is the responsibility of the applicant to protect the graves during the operational phase of the mine.
- The proposed mining development must provide at least 100m buffer zone from the recorded burial site.
- The burial site must be mapped and clearly marked to avoid any accidental damage to the graves.

8.2.11 Social Impacts

It is important to understand the difference between a social change process and a social impact. Social change processes are set in motion by project activities or policies. Social change processes can be measured objectively, independent of the local context. Examples of a social change process are increase in the population, relocation or presence of temporary workers. Under certain circumstances these processes may result in social impacts, but if managed properly these changes may not create impacts. Whether impacts are caused will depend on the characteristics and history of the host community, and the extent of mitigation measures that are put in place (Vanclay, 2003).

A social impact is something that is experienced or felt by humans. It can be positive or negative. Social impacts can be experienced in a physical or perceptual sense. Social impacts can be either objective or subjective. Objective social impacts can be quantified and verified by independent observers in the local context, such as changes in employment patterns, in standard of living or in health and safety. Subjective social impacts occur "in the heads" or emotions of people, such as negative public attitudes, psychological stress or reduced quality of life. It is very likely that a number of social changes processes will be set in motion by the project. Whether these processes result in social impacts will depend on the successful implementation of the suggested mitigation measures.

Impacts on the social environment are expected to occur as follows:

- Crime and violence.
- Influx of migrant workers.
- Loss of sense of place.
- Social vices.

8.2.11.1 Significance of Impacts

Social impacts will be negative and site specific. Social impacts will remain for the duration of the Mining Permit period and have an overall to moderate significance. With mitigation, the impacts can be controlled but not prevented.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Crime and violence	-12,00	-5,00	-5,00
Influx of migrant workers	-13,00	-12,00	-12,00
Loss of sense of place	-9,00	-5,25	-5,25
Social vices	-9,00	-8,25	-8,25

The following mitigation types have been associated with potential social impacts:

- Avoidance and control through preventative measures (e.g. site security, code of conduct).
- Avoidance and control through mitigation measures (e.g. recruitment procedure, grievance mechanism, code of conduct).

8.2.12 Socio-Economic Impacts

The study of economic development, which is generally broad in its scope, refers to the standard of living of citizens; most often measured by GDP per capita, literacy rate, and life expectancy. Economic development incorporates many elements of pure macro-economics, such as price stability, high employment, and sustainable growth. However, this is underpinned by the study of infrastructure and social development programmes, such as education, housing, and road networks. Mine operations have the potential to positively or negatively influence/affect the economic environment of the area. Mines contribute directly towards employment, procurement, skills development and taxes on a local, regional and national scale. In addition, mines indirectly contribute to economic growth in the local and regional economies because the increase in the number of income earning people has a multiplying effect on the trade of other goods and services in other sectors.

However, the introduction of a mine into an area can have undesirable implications in the surrounding environment. This is because changes occur not only to the pre-existing land uses but also to the existing associated social structures and general way of life. The closure phase of the mine can have highly negative impacts because the surrounding environment loses the economic support that it receives during the operation of the mine. To ensure the economic safety of the communities which are affected by the mining operations, mitigation measures post closure of the mine will need to consider the economic environment of the communities and address these impacts effectively.

Impacts on the socio-economic environment are expected to occur as follows:

- Coal supply for metallurgical companies.
- Economic growth.
- Education, skills development and training.
- Employment opportunities.

8.2.12.1 Significance of Impacts

The socio-economic impact will be positive in nature and of short-term duration over the region. Considering the levels of unemployment in the area, the significance is moderate. The impact is definite but will only be temporary as employment positions will be lost once the mining activities cease. Implementation of mitigation measures will help maximise the positive impact of the mining operation.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Coal supply for metallurgical companies	13,00	18,75	21,88
Economic growth	6,00	12,00	14,00
Education, skills development and training	5,50	8,25	9,63
Employment opportunities	9,00	12,00	14,00

The following mitigation types are associated with potential socio-economic impacts:

- Maximise through optimisation of economic growth opportunities.
- Maximise employment opportunities, skills development and training.
- Minimise impacts of job loss through compensation, skills development and livelihood restoration.
- Avoid through implementation of preventative measures (e.g. consultation and communication).
- Maximise security of Coal supply through sound and responsible mine management.

8.2.13 Impacts on Health and Safety

It is important to recognise that mining activities, equipment, and infrastructure can increase community exposure to risks and impacts. The mining activities can result in a possible increase in crime due to increased number of strangers in the community. Hazardous structures and excavations may pose a threat to community safety if not correctly located, properly designed and correctly managed. By way of example, excavations may pose a risk to animals and people if not properly managed to prevent unauthorised access. The use of hazardous materials on the mine may result in a community health and safety risk if these materials are not stored, handled and disposed of in an appropriate manner. For example, the storage and use of explosives may represent a safety risk if appropriate controls and procedures are not followed.

Fly rock in particular may pose a risk to people, animals and infrastructure within close proximity to the mine. The use of public roads for hauling Coal will result in increased safety risks for members of the community and public utilising these roads. Mining activities have the potential to increase the risk of accidental fires. Impacts on ecosystem services can impact on communities, particularly where these communities rely on these ecosystem services (e.g. water from watercourses) for their livelihoods. The contamination or degradation of natural resources, such as adverse impacts on the quality, quantity, and availability of freshwater, may result in health- related risks and impacts. Land use changes may result in the loss of natural buffer areas such as wetlands, and impacts to natural vegetation areas that mitigate the effects of natural hazards such as flooding, landslides, and fire, may result in increased vulnerability

and community safety-related risks and impacts. An influx of people to the mining area seeking employment may the increase the risk for community exposure to waterborne, water based, water-related, and vector borne and communicable diseases.

Impacts on health and safety are expected to occur as follows:

- Fire and explosion hazard.
- Fly rock
- Health impacts.

8.2.13.1 Significance of Impacts

The socio-economic impact will be positive in nature and of short-term duration over the region. Considering the levels of unemployment in the area, the significance is moderate. The impact is definite but will only be temporary as employment positions will be lost once the mining activities cease. With mitigation, the impact can be controlled but not prevented.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Fire and explosion hazard	-7,50	-4,50	-5,25
Fly rock	-7,50	-4,50	-5,25
Health impacts	-12,50	-6,00	-7,00

The following mitigation types are associated with potential impacts on health and safety:

- Avoidance and control through preventative measures (e.g. HIV/AIDS awareness).
- Remedy through application of mitigation measures in EMPR.
- Avoid and control through implementation of preventative measures (e.g. fire breaks, blasting procedures, hazardous substances management).
- Avoid and control through implementation of preventative measures (e.g. blast procedures, monitoring, communication with landowners, emergency response procedures).

8.2.14 Impacts on Transportation, Infrastructure and Traffic

In terms of potential impacts, the mine will result in increased use of the local road network which may result in the deterioration of road surfacing, damage to bridges and culverts in the area, and safety risks to surrounding communities. This will be predominantly due to the increase in transport of heavy machinery, and vehicles carrying Coal and labour for mining activities. Increased traffic may have repercussions on safety for other road users, predominantly by increasing the potential for road accidents in nearby communities.

Impacts on transportation, infrastructure, and traffic are expected to occur as follows:

- Damage to road infrastructure.
- Increased traffic.

8.2.14.1 Significance of Impacts

The impacts on transportation, infrastructure, and traffic will be negative. With mitigation, the impact can be controlled but not prevented and will remain low to moderate in significance.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Damage to road infrastructure	-11,00	-4,00	-4,67
Increased traffic	-12,00	-10,00	-10,00

The following mitigation types have been associated with potential impacts on transportation, infrastructure and traffic:

- Avoid and control through implementation of EMPR mitigation measures (e.g. speed limit enforcement and vehicle maintenance).

8.2.15 Visual Impact

Considering the rural setting of the application area and the mountain backdrop, it is anticipated that the introduction of mining structures and related activities would create strong contrast with the existing landscape characteristics. During mining, it is expected that there will be haul trucks and other mine vehicles on the roads. This, along with the removal of vegetation, dust generation and preparation of opencast mining areas will result in a negative impact on the visual aspect. Operational areas may require lighting at night for safety reasons.

The visual impact is expected to occur as follows:

- Visual impact of mine infrastructure, stockpiles and dust.

8.2.15.1 Significance of Impact

The impact on transportation, infrastructure, and traffic will be negative. Mitigation is possible and effective if implemented correctly.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Visual impact of mine infrastructure, stockpiles and dust	-9,00	-5,25	-5,25

The following mitigation types have been associated with the potential visual impact:

- Avoid and control through implementation of EMPR mitigation measures (e.g. directional down lighting, dust suppression, mine planning and progressive rehabilitation).

8.2.16 Impacts on Air Quality

Existing sources of emissions in the region and the characterization of existing ambient pollution concentrations is fundamental to the assessment of cumulative air impacts. A change in the ambient air quality can result in a variety of impacts which in turn may cause a disturbance to and/or health impacts on nearby receptors. Sensitive receptor sites include residential areas, communities, and natural environments. Mining activities have the potential to result in increased levels of atmospheric dust, increased concentrations of PM10 (Particulate Matter with an aerodynamic diameter of less than 10µm) and increased concentrations of PM2.5 (Particulate Matter with an aerodynamic diameter of less than 2.5µm). Historical evidence indicates that the pollutant of concern associated with open-cast mining operations is particulate matter creating a dust source and resulting in human health concerns and nuisance.

Impact on air quality is expected to occur as follows:

- Fugitive emissions (Dust).

8.2.16.1 Significance of Impact

The impact on air quality will be negative. With mitigation, the impact can be controlled but not prevented and will remain low in significance.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Fugitive emissions (Dust)	-13,00	-7,50	-8,75

The following mitigation types have been associated with potential impacts on air quality:

- Avoid and control through implementation of EMPR mitigation measures (e.g., vehicle maintenance and progressive rehabilitation).
- Avoid through preventative measures (e.g., speed limit enforcement).
- Control through implementation of EMPR mitigation measures (e.g., dust suppression).

8.2.17 Noise Impact

Certain noise generating activities associated with mining operations can cause an increase in ambient noise levels in and around the site. Significant noise is associated with opencast and plant (including workshops) activities. A source of noise during the operational phase will be traffic to and from the site, traffic around the facility, RoM and product transport and activities associated with waste management. In some cases, mining and related activities may result in an increase in noise levels above the allowable

thresholds. Whilst studies show that the response differs greatly between species, noise typically disturbs animals and results in them moving away from the source of noise or becoming adapted to the noise. Some of the typical effects that disturbing noise may have on sensitive receptors include interference with daily activities (work, leisure and sleeping), hindered speech communication, impeded thinking process and interference with concentration. Mine workers in very close proximity to noisy activities would be at risk to hearing damage if the proper precautions (e.g. use of personal protective equipment) are not taken.

The impact of noise is expected to occur as follows:

- Disturbing and/or nuisance noise

8.2.17.1 Significance of Impact

The impact of noise will be negative and will remain for the duration of the Mining Permit period. With mitigation, the impact can be controlled but not prevented and will remain low in significance.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Disturbing and/or nuisance noise	-9,00	-5,50	-6,42

The following mitigation types have been associated with the potential noise impact:

- Avoid through preventative measures (e.g. communication with landowners and timing of activities).
- Control through implementation of EMPR mitigation measures (e.g. noise abatement measures).

8.2.18 Blasting and Vibration

The application of explosives for breaking rock will always have an effect on the surrounding environment. These effects can manifest in the form of ground vibration, air blast, fumes, fly rock and noxious fumes. These short duration events may be noticeable by communities and individuals living in the immediate environment. These events tend to cause nuisance and elicit an emotive response because of resonance because they are easily recognised as being related to blasting.

Impacts of blasting and vibration are expected to occur as follows:

- Ground vibration and human perception.
- Impacts on infrastructure (roads, communications infrastructure, services, houses, boreholes).
- Noxious fumes.

8.2.18.1 Significance of Impacts

The impacts of blasting and vibration will be negative and will remain for the duration of the Mining Permit

period. Mitigation is possible and is effective in most cases.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance Score
Air blast	-12,00	-6,00	-7,00
Ground vibration and human perception	-12,00	-8,25	-9,63
Impacts on infrastructure (roads, communications infrastructure, services, houses, boreholes	-12,00	-8,25	-9,63
Noxious fumes	-12,00	-8,25	-9,63

The following mitigation types are associated with potential blasting and vibration impacts:

- Avoid and control through implementation of preventative measures (e.g. blast procedures, monitoring, communication with landowners, emergency response procedures).

9 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

No alternatives have been investigated as the activity or project is solely dependent on the underlying geology, prospecting results and historical mining operations on the property, as well as surrounding areas which indicate that economically viable mineral resources occur within the application area.

10 STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE

No alternative development location within the overall site was selected as no alternatives were considered.

11 FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY

The impact assessment process may be summarised as follows:

- Identification of proposed mining activities including their nature and duration.
- Screening of activities likely to result in impacts or risks.
- Utilisation of the above-mentioned methodology to assess and score preliminary impacts and risks identified.
- Inclusion of I&AP comments regarding impact identification and assessment.

- Finalisation of impact identification and scoring.

The impact significance rating methodology is guided by the requirements of the NEMA 2014 EIA Regulations (as amended). Please refer to Section 10.1 for a full description of the impact assessment methodology. Please refer to Table 27 for a description of the activities and associated impacts.

12 IMPACT ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

Table 27: Impact significance table.

IMPACT DESCRIPTION						
Aspect	Main Activity/Action/Process	Impact	Phase	Pre-Mitigation	Post-Mitigation	Final Score
Social	Site establishment	Safety and security risks to landowners and lawful occupiers	Planning	-12,00	-8,00	-9,33
Social	Site establishment	Interference with existing land uses	Planning	-7,50	-5,25	-5,25
Social	Site establishment	Sense of place	Planning	-9,00	-5,25	-5,25
Social	Site establishment	Safety and security risks to landowners and lawful occupiers	Construction	-12,00	-8,00	-9,33
Social	Site establishment	Interference with existing land uses	Construction	-7,50	-5,25	-5,25
Social	Site establishment	Sense of place	Construction	-9,00	-5,25	-5,25
Social	General mine management	Crime and violence	Operation	-12,00	-5,00	-5,00
Social	General mine management	Influx of migrant workers	Operation	-13,00	-12,00	-12,00
Social	General mine management	Sense of place	Operation	-9,00	-5,25	-5,25
Social	General mine	Social vices	Operation	-9,00	-8,25	-8,25

	management					
Socio-economic	Mining	Coal supply	Operation	13,00	18,75	21,88
Socio-economic	Mining	Economic growth	Operation	6,00	12,00	14,00
Socio-economic	Mining	Education, skills development and training	Operation	5,50	8,25	9,63
Socio-economic	Mining	Employment opportunity	Operation	9,00	12,00	14,00
Health and safety	Maintenance and operation of site infrastructure and facilities	Fire and explosion hazard	Operation	-7,50	-4,50	-5,25
Health and safety	Opencast mining	Fly rock	Operation	-7,50	-4,50	-5,25

IMPACT DESCRIPTION						
Aspect	Main Activity/Action/Process	Impact	Phase	Pre-Mitigation	Post-Mitigation	Final Score
Health and safety	Opencast mining	Health impacts	Operation	-12,50	-6,00	-7,00
Land capability	Maintenance and operation of site	Loss of soil fertility, soil resource and its utilisation potential	Operation	-12,00	-11,00	-12,83
Land use	Opencast mining	Impacts on services	Operation	-9,00	-5,00	-5,00
Land use	Opencast mining	Interference with existing land uses	Operation	-9,75	-7,50	-8,75

Soil	Opencast mining	Soil compaction	Operation	-11,00	-7,50	-10,00
Soil	Opencast mining	Soil pollution/contamination	Operation	-11,00	-5,50	-7,33
Soil	Opencast mining	Erosion and sedimentation	Operation	-11,00	-5,50	-7,33
Topography and landform	Opencast mining	Alteration of topography	Operation	-15,00	-13,75	-13,75
Topography and landform	Opencast mining	Altered drainage patterns	Operation	-11,00	-5,00	-5,00
Transportation, infrastructure and traffic	Opencast mining	Soil surface subsidence	Operation	-10,00	-4,00	-4,67
Transportation, infrastructure and traffic	Opencast mining	Damage to infrastructure	Operation	-11,00	-4,00	-4,67
Transportation, infrastructure and traffic	Opencast mining	Increased traffic	Operation	-12,00	-10,00	-10,00
Visual	Opencast mining	Visual impact of mine infrastructure, stockpiles and dust	Operation	-9,00	-5,25	-5,25
Air quality	Opencast mining	Fugitive emissions (dust)	Operation	-13,00	-7,50	-8,75

Blasting and vibration	Opencast mining	Ground vibration and human perception	Operation	-12,00	-8,25	-9,63
Blasting and vibration	Opencast mining	Impact on infrastructure	Operation	-12,00	-8,25	-9,63
Blasting and vibration	Opencast mining	Noxious fumes	Operation	-12,00	-8,25	-9,63
Noise	Opencast mining	Noise generation	Operation	-9,00	-5,50	-6,42
Fauna and flora	Opencast mining	Direct and indirect mortality of flora and fauna	Operation	-12,00	-7,50	-8,75
Fauna and flora	Opencast mining	Habitat fragmentation and blockage of seasonal and dispersal movements	Operation	-10,00	-6,00	-6,00
Fauna and flora	Opencast mining	Introduction/invasion by alien (non-native) species	Operation	-6,75	-3,50	-4,08

IMPACT DESCRIPTION						
Aspect	Main Activity/Action/Process	Impact	Phase	Pre-Mitigation	Post-Mitigation	Final Score
Surface water	Opencast mining	Pollution of surface water resources/decreased water quality	Operation	-8,25	-4,50	-5,25

Surface water	Opencast mining	Decrease in surface water availability	Operation	-5,50	-4,50	-5,25
Ground water	Opencast mining	Pollution of groundwater	Operation	-13,00	-6,00	-7,00
Heritage	Opencast mining	Discovery and preservation of fossils	Operation	-10,00	-3,50	-4,67
Heritage	Opencast mining	Destruction/damage of palaeontological resources	Operation	-11,00	-3,50	-4,67
Heritage	Opencast mining	Destruction/damage of heritage resources	Operation	-7,50	-3,00	-4,00
Geology	Opencast mining	Impacts on geology	Operation	-14,00	-18,75	-25,00
Environmental Pollution	Opencast mining	General environmental pollution	Operation	-13,00	-6,00	-7,00
Environmental Pollution	Opencast mining	Hydrocarbon spills/contamination	Operation	-10,50	-4,00	-4,67
Environmental Pollution	Opencast mining	Sewage spills/contamination	Operation	-9,00	-4,50	-5,25
Soil	Decommissioning of surface infrastructure	Soil compaction	Decommissioning	-11,00	-7,50	-10,00
Visual	Decommissioning of surface infrastructure	Visual impact of mine infrastructure, stockpiles and dust	Decommissioning	-9,00	-5,25	-5,25

Noise	Decommissioning of surface infrastructure	Noise generation	Decommissioning	-9,00	-5,50	-6,42
Surface water	Decommissioning of surface infrastructure	Pollution of surface water resources/decreased water quality	Decommissioning	-8,25	-4,50	-5,25
Ground water	Decommissioning of surface infrastructure	Pollution of groundwater	Decommissioning	-13,00	-6,00	-7,00
Environmental Pollution	Decommissioning of surface infrastructure	General environmental pollution	Decommissioning	-13,00	-6,00	-7,00
Soil	Surface rehabilitation	Erosion and sedimentation	Rehab and closure	-11,00	-5,50	-7,33
Topography and landform	Surface rehabilitation	Altered drainage patterns	Rehab and closure	-11,00	-5,00	-5,00
Environmental Pollution	Surface rehabilitation	General environmental pollution	Rehab and closure	-13,00	-6,00	-7,00

13 ENVIRONMENTAL IMPACT STATEMENT

Based on the impact assessment conducted by the EAP and various studies, the environmental impacts associated with the mining activities are expected to be localised and of low to medium significance, with one impact (impact on geology) remaining permanently high even if mitigation measures are implemented. Mitigation measures have been recommended by the EAP and specialists in order to eliminate and/or reduce environmental impacts. These mitigation measures and monitoring programmes have been included as commitment in the Environmental Management Programme. The Environmental Management Programme aims to present management measures that will eliminate, offset or reduce adverse environmental impacts, as well as to provide the framework for environmental monitoring. The primary purpose of the Environmental Management.

Programme is to ensure that negative environmental impacts of the proposed project are effectively managed within acceptable limits and that the positive impacts are enhanced.

In terms of site sensitivities, the most sensitive features which will require protection on site may be summarised as follows:

- Watercourses and wetlands.

In terms of positive impacts, the following key benefits have been identified:

- Coal supply for the market.
- Economic growth.
- Employment opportunities.

14 SUMMARY OF POSITIVE AND NEGATIVE IMPLICATIONS AND RISKS

The positive implications of the proposed project include (i) economic growth, (ii) employment, (iii) Coal supply, (iv) education, (v) skills development and (vi) training. In terms of risks and negative implications, the mine will have an adverse effect on the environment. These include impacts to the geophysical, hydrological, biological, and social aspects of the local environment. The most severe risks relate to the potential for water pollution and the destruction of heritage resources. These potential impacts also have legal implications and risks should they not be minimised through the application of mitigation measures.

This Basic Assessment Report and the associated EMPR has identified appropriate mechanisms for avoidance and mitigation of negative impacts. It is anticipated that the implementation of the measures stipulated in this report will result in effective mitigation of the negative impacts. Conversely, the implementation of the mitigation measures is designed to maximise the positive aspects of the project and it will result in a significant positive influence as a result of the small-scale mine's operation. There is a notable risk that may results in relation to influx of employee which may give rise to theft on surrounding farms.

15 PROPOSED IMPACT MANAGEMENT OBJECTIVES AND OUTCOMES

The following potential mitigation measures and residual risks have been provided for each environmental aspect assessed. It is noted that the draft BAR and EMPR report was made available to I&APs for review and comment, and their comments and concerns were addressed in this final report that is submitted to the DMRE for adjudication. Furthermore, it is noted that the results of the public consultation were utilised to update the proposed potential mitigation measures prior to the submission of this finalised BAR and EMPR to the DMRE for decision-making.

As a result of the impact assessment and the specialist studies undertaken, the following principles and objectives have been identified for the management of the proposed Project:

- Socio-Economic

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

- Always adhere to an open and transparent communication procedure with stakeholders.
- Ensure that accurate and regular information is communicated to I&APs.
- Ensure that information is communicated in a manner which is understandable and accessible to I&APs.
- Enhance project benefits and minimise negative impacts through intensive consultation with

stakeholders.

- Assemble adequate, accurate, appropriate, and relevant socio-economic information relating to the context of the operation.
- Ensure that recruitment strategies for the mine prioritizes the sourcing of local labour and share in gender equality.
- Ensure an atmosphere of equality and non-discrimination among the workforce.
- Contribute to the development of functional literacy and numeracy among employees.
- Empower the workforce to develop skills that will equip them to obtain employment in other sectors of the economy.
- Historical and Cultural Aspects

The following objectives should be attained during the planning, construction, operation, and decommissioning phases of the mining operations:

- All heritage sites must be demarcated as No-Go Zones to prevent accidental damage by mining activities.
- A Cultural Heritage Management Plan must be established.
- Topography

The following objectives should be attained during the planning, construction, operation, and decommissioning phases of the mining operations:

- Maintain the integrity of the landscape as far as possible by reinstating the topography to match the surroundings.
- Reinstate vegetation cover to match the surroundings.
- Monitor the reinstated areas to ensure that erosion does not occur.
- Ensure drainage lines are not disturbed as far as possible.
- Create pollution control structures to ensure pollution on site is minimised.
- Geology

The following objectives should be attained during the planning, construction, operation, and decommissioning phases of the mining operations:

- Stockpile slopes should be kept as flat as possible.
- Areas of high danger should be checked regularly for potential subsidence.
- Soil

The following objectives should be attained during the planning, construction, operation, and decommissioning phases of the mining operations:

- Only clear areas needed and keep footprints as small as possible.
- Vegetate topsoil stockpiles as soon as possible. Implement storm water management infrastructures.
- Keep active pit area as small as possible and implement continual rehabilitation.
- Conduct waste classification of overburden material. Backfill opencast as soon as possible to reduce volume of overburden stored on site.
- Land Use

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Preserve soil so that land capability class can be re-established post mining (as far as this is possible).
- Surface Water

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Ensure minimal impact to the surface water resources.
- Ensure that the construction activities are carried out so as to aid rehabilitation during decommissioning.
- Groundwater

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Prevent construction material becoming a source for pollution to the local aquifers.
- Ensure effective management of any accidental spills.
- Flora

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Ensure awareness amongst all staff, contractors and visitors to site to not needlessly damage flora.
- A management plan for the control of invasive alien species needs to be implemented. Specialist advice should be used in this regard. This plan should include pre-treatment, initial treatment and follow-up treatment and should be planned and budgeted for in advance. The cleared areas after removal should be re-vegetated with indigenous naturally occurring species to decrease large patches of bare soil. The best mitigation measure in this regard is avoiding invasive and/or exotic species from being established. It is vital that the control of alien invasive species is ongoing.

- No foraging, food and wood collecting within the veld should be allowed.
- Eliminate alien invasive and exotic plants.
- Minimise and limit the destruction or disturbance of vegetation of the proposed mining areas and mine infrastructure. The vegetation removal should be controlled and should be very specific.
- Prevent the destruction of natural and/or pasture vegetation of the surrounding areas that will not be mined.
- Prevent heavy machinery and light vehicles driving through natural vegetation that will not be disturbed by the proposed activities.
- Prevent the destruction of vegetation in areas prone to soil erosion.
- Remove and relocate any rare and endangered species within the areas where the natural vegetation will be destroyed.
- Prevent any pollution of natural vegetation, wetlands and red data species.
- Fauna

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Fauna (domestic animals) may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-Contractors' employees.
- Activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act 71 of 1962). Workers should also be advised on the penalties associated with the needless destruction of wildlife, as set out in this act.
- Appoint an ECO to oversee the activities and ensure that ecological aspects are kept in mind.
- Priority species, specifically nests if encountered, should be identified first and a management plan should be established for each of the priority species.
- Continuous rehabilitation and clean-up of the area should be implemented during the operational phase.
- Limit activities (transport etc.) to the smallest area possible. This is to prevent fragmentation that may have irreversible changes to faunal communities. It also increases the invasion of alien/foreign species.
- A management plan for the control of invasive and exotic plant species needs to be implemented (if required).
- No camping activities or other contractor camps should be allowed on Project and this practice will be a good investment in preventing more impacts, noise and waste or possibly the spread of fires.
- Air Quality

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Implement dust suppression in and around site as needed.
- Vehicles must be regularly serviced.
- By minimising the removal of vegetation and topsoil in affected area, this will minimise the potential for dusty conditions.
- Vehicles utilising public gravel roads must adhere to the speed limits.

- Noise

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- All vehicles and machinery must be maintained in good working order.
- When working or traveling past noise sensitive receptors, no unnecessary hooting or noise should occur.
- Visual

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- To limit the visual impact of mining and related infrastructure as far as possible during mining.
- To enhance the visual aspect and maintain the aesthetics of the region post mining.
- Transportation, Infrastructure and Traffic

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Ensure trucks and vehicles remain on roads and areas designated as a construction site to limit disturbance to areas unaffected by construction.
- Ensure drivers are informed that off-road travelling is prohibited except where otherwise not practically feasible.
- Ensure speed limits are set on all roads and enforce speed limits. Ensure all drivers at the site are informed about speed limits.
- Drip trays must be placed under vehicles.
- Any spills or leaks must immediately be cleaned up and the contaminated soil suitably disposed of.
- During refuelling of vehicles or equipment, drip trays must be utilised to prevent spills or leaks.

- Spill clean-up equipment must be available on site at all times.
- In the event of large spills, this must be reported to the authorities and a specialist spill contractor immediately sought to assist with the clean-up
- Create safe entry roads into the construction and mining areas.
- Repair damage to road infrastructure.
- Maintain safety to pedestrians and motorists.

Health and Safety

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Undertake mining and ancillary activities in safe and responsible manner to protect the safety of people and the environment.
- Manage hazardous materials and explosives in a safe and responsible manner to protect the safety of people and the environment.

Environmental Pollution

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Any excess or waste material or chemicals must be removed from the site and must preferably be recycled (e.g. oil and other hydrocarbon waste products).
- Any waste materials or chemicals that cannot be recycled must be disposed of at a suitably licensed waste facility.
- All permanent facilities must be removed from site upon closure. This will include the associated equipment, material and waste on site.
- Under no circumstances is any form of waste to be disposed of on site.

16 ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

- The approval of the project is for opencast mining of a 5 ha area only.
    - A 100 m buffer zone around watercourses must be regarded as a No-Go area for mining activities.
- A 100 m buffer zone around existing structures (such as dwellings, pipelines, Eskom underground and overhead powerlines, cemeteries, any fences, etc.) must be regarded as No-Go areas for mining activities unless permission is granted by landowners and/or relevant authorities.
- The Mining Permit holder must appoint a suitably qualified Environmental Control Officer (ECO) who must oversee the mining activities and monitor compliance with the EMPR and relevant legislation.

- The EMPR must be made binding on all contractors, sub-contractors or agents operating on behalf of the Mining Permit Holder.
- Stakeholder engagement will continue throughout the mining activities to ensure the community and landowners are kept informed and allowed to raise issues. These issues will then be addressed through a grievance mechanism.
- No animal burrows found on site should be destroyed, and no wild animals found during the operations should be killed.
- Any pit left open temporarily (not backfilled during the operations) should be fenced off to prevent humans and animals from falling into the pits.
- All topsoil stockpiles must be removed and the soil be reused as topsoil again on the denuded areas.
- All denuded backfill and the surfaces revegetated upon completion of operations.
- The Mining Permit holder should adhere to the conditions of the EA, EMPR and the specialist reports for this project.
- Arrangements for Financial Provision for the decommissioning, closure and rehabilitation must be made prior to the commencement of the mining activities.

17 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

Certain assumptions, limitations, and uncertainties are associated with the BAR and EMPR. These are detailed for each aspect below:

17.1 Heritage

Although all efforts were made to locate, identify and record all possible cultural heritage sites and features (including archaeological remains) there is always a possibility that they might have been missed as a result of grass cover and other factors. The subterranean nature of these resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any development actions then an expert should be contacted to investigate and provide recommendations on the way forward. From a cultural heritage point of view the development can therefore continue, taking cognisance of the recommendations.

17.2 Surface Water

The Surface Water specialist report is a desktop assessment, and the assessment is thus based on available information. It is not expected that the proposed opencast activities will have a significant impact on the water resource mostly due to the fact that the activities are located more than 100 m from the nearest water

resource.

17.3 Flora

The desktop flora study was conducted with up-to-date resources and the site visit was conducted as thoroughly as possible. However, it might be possible that additional information becomes available in time, as environmental impact assessments deal with dynamic natural ecosystems. It is therefore important that the specialist report be viewed and acted upon with these limitations in mind. In order to obtain a comprehensive understanding of the dynamics of the vegetation of the study area, surveys should ideally have been replicated over several seasons and over a number of years. However, due to project time constraints such long-term studies are not feasible, and this vegetation survey was conducted in one season.

Species flowering only during specific times of the year could be confused with a very similar species of the same genus and some plant species that emerge and bloom during another time of the year or under very specific circumstances may have been missed entirely. No scientific data was collected or analysed for the calculation of ecological veld condition. Any comments or observations made in this regard are based on observations, the expert knowledge and relevant professional experience of the specialist investigator. The specialist responsible for this study reserves the right to amend this report, recommendations and/or conclusions at any stage should any additional or otherwise significant information come to light.

17.4 Fauna

In terms of the baseline investigation conducted. No amphibians or reptiles with red listed status were recorded for the quarter degree square and suitable habitat for these species is associated closer to the nature reserve and not the footprint. No red listed butterflies were recorded for the specific quarter degree square. There are several sensitive birds recorded in the baseline study that enjoys conservation status.

18 REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

This BAR and EMPR has assessed the potential impacts associated with the proposed mining activities and mitigation measures have been developed to address the impacts identified. Furthermore, this BAR and EMPR has been compiled in accordance with the most recent guidelines and legislation. The draft BAR and EMPR was also be made available to I&APs review and comments, and appropriate changes have been made to this final BAR and EMPR as a result of the I&APs consultation process. Furthermore, appropriate measures are included in the BAR and EMPR wherever possible, to ensure I&APs concerns are addressed. As such, the EAP is of the opinion that the activity should be authorised.

19 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The Environmental Authorisation is required for 2 years and may be renewed for three periods of which may not exceed one year.

20 UNDERTAKING

It is confirmed that the undertaking required to meet the requirements of this section is provided at the end of the EMPR and is applicable to both the BAR and the EMPR.

21 FINANCIAL PROVISION

The Regulations pertaining to the Financial Provision for Mining and Production Operations promulgated under Section 44(A) (e), (f), (g), (h) read with sections 24(5)(b)(ix), 24(5)(d), 24N, 24P and 24R of the National Environmental Management Act, 1998 (Act 107 of 1998) (20 November 2015) have been considered and this is anticipated to result in an increase in the rehabilitation costs estimated using the above mentioned quantum. The amount that is required to both manage and rehabilitate the environment in respect of rehabilitation is reflected in the quantum of financial provision in Section 32 (Part B) of the report. An amount of R 1 139 372 will be required for rehabilitation of a 5 ha.

Table 28: Financial Provision for Rehabilitation

CALCULATION OF THE QUANTUM

MP 30/5/1/3/2/13020 MP

Applicant: **Vernex Holdings (Pty) Ltd** REF No:
Evaluator: **Zwivhuya Tshabuse** Date: Dec-22

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	**Dismantling of processing plant and related structures (including overland conveyors and powerlines)**	**m3**	**0**	**17.14**	**1**	**1**	**0**
2 (A)	**Demolition of steel buildings and structures**	**m2**	**0**	**238.71**	**1**	**1**	**0**
2(B)	**Demolition of reinforced concrete buildings and structures**	**m2**	**0**	**351.79**	**1**	**1**	**0**
3	**Rehabilitation of access roads**	**m2**	**0**	**500**	**1**	**1**	**0**
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414.61	1	1	**0**
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	226.15	1	1	**0**
5	**Demolition of housing and/or administration facilities**	**m2**	**0**	**477.42**	**1**	**1**	**0**
6	**Opencast rehabilitation including final voids and ramps**	**ha**	**4.1**	**242984.15**	**0.5**	**1**	**498117.5075**
7	**Sealing of shafts adits and inclines**	**m3**	**0**	**128.15**	**1**	**1**	**0**
8 (A)	**Rehabilitation of overburden and spoils**	**ha**	**0.03**	**166847.44**	**1**	**1**	**5005.4232**
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.003	207805.47	1	0	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0.06	603565.59	1	1	**36213.9354**
9	Rehabilitation of subsided areas	ha	0	139709.6	1	1	**0**
10	**General surface rehabilitation**	**ha**	4.1	132171.31	0.5	1	**270951.1855**
11	River diversions	ha	0	132171.31	1	1	**0**
12	**Fencing**	**m**	**0**	**150.77**	**1**	**1**	**0**
13	**Water management**	**ha**	**0.06**	**50255.25**	**0.6**	**1**	**1809.189**
14	**2 to 3 years of maintenance and aftercare**	**ha**	**0**	**17589.34**	**1**	**1**	**0**
15 (A)	**Specialist study**	**Sum**	**0**	**0**	**1**	**1**	**0**
15 (B)	Specialist study	Sum	0	0	1	1	**0**
					Sub Total 1		**812097.2406**

1	Preliminary and General	97451.66887	**weighting factor 2** 1	**97451.66887**
2	Contingencies	81209.72406		**81209.72406**
			Subtotal 2	**990758.63**
			VAT (15%)	**148613.80**
			Grand Total	**1139372**

SIGN Zwivhuya Tshabuse
DATE 12/12/2022

22 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

As part of the consultation process, the Competent Authority requires proof of consultation of the community concerned that is supported by a resolution taken in a meeting attended. This report has the required information.

23 COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) READ WITH SECTION 24(3)(A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998) THE BAR REPORT MUST INCLUDE THE:

23.1 Impact on the Socio-Economic Conditions of any Directly Affected Person

The potential impacts on the socio-economic conditions have the potential to include:

- Education, skills development and training
- The implementation of skills development and training programmes will have a direct positive effect on a number of individuals.
- Employment opportunities
- The operation of the mine will result in both direct and indirect employment opportunities.
- Influx of migrant workers
- The mining operations can result in the influx of migrant workers seeking jobs and thereby reducing the number of jobs available to local labour. This is addressed through the recruitment procedure which focuses on employment of local labour.
- Upon closure and downscaling of mining operations, there will be a loss of jobs and income for a large number of individuals. Training and skills development aim to equip to employees with portable skills, thereby opening up other employment opportunities post mining.
- Perceptions and expectations
- When a new mine operation commences in an area there is often false perceptions and expectations, particularly surrounding potential employment. There are inevitably more people seeking jobs than the number of jobs available at the mine, especially for unskilled labour. The manner in which false perceptions and expectations is addressed is through extensive consultation and communication to ensure people are fully aware of the potential employment opportunities and recruitment process.

The consultation process allows directly affected parties to raise their concerns. It is noted that I&APs, including directly affected parties such as landowners, were given the opportunity to review and comment on the draft BAR and EMPR. The results of the public consultation are included in this final report that is submitted to the Department for adjudication.

23.2 Impact on any National Estate Referred to in Section 3(2) of the National Heritage Resources Act

Integrated Specialist Services (Pty) Ltd conducted the Phase 1 Archaeological and Heritage Impact Assessment Report for the proposed coal mining permit application. The literature review and field research confirmed that the project area is situated within a contemporary cultural landscape dotted with settlements with long local history. The field survey recorded one burial site outside the proposed mining permit application site. Although the site is fairly outside the mine permit application site, it may be indirectly affected by auxiliary mine infrastructure developments such as storm water management, erosion control and access roads. As such it is the responsibility of the applicant to protect the sites during mining. No mining activity should take place within 100m from the site. In terms of the archaeology and heritage in respect of the proposed mining development site, there are no obvious 'Fatal Flaws' or 'No-Go' areas on the site however the burial site must be treated as a No Go area. The potential for chance finds is rated low, however, the applicant and contractors are advised to be diligent during clearance and mining, should mining activities commence on the site. This report concludes that the mining permit application may be approved by SAHRA/MPHRA to proceed as planned subject to recommendations herein made and heritage monitoring and management plan being incorporated into the EMPr. The mitigation measures are informed by the results of the AIA/HIA study and principles of heritage management enshrined in the NHRA.

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

There are no other matters required in terms of Section 24(4)(A) and (B) of the Act.

PART B:

ENVIRONMENTAL MANAGEMENT PROGRAMME

25 INTRODUCTION

25.1 Details of the EAP

The details and expertise of the EAP are detailed in Sections 2 above as required.

25.2 Description of the Aspects of the Activity

A description of the aspects of the activity covered by the EMPR below is included in Section 2 above.

26 ENVIRONMENTAL MANAGEMENT PRINCIPLES

It is extremely important for effective environmental management that the Applicant be aware of the general principles upon which sound environmental management is based and that these principles are considered in all aspects of the mining operation. NEMA has established a general framework for environmental law, in part by prescribing national environmental management principles that must be applied when making decisions that may have a significant impact on the environment. These principles are briefly summarized in the sections that follow.

26.1 Holistic Principle

The Holistic principle, as defined by NEMA (Section 2(4)(b) requires that environmental management must be integrated, acknowledging that all elements of the environment are linked and inter-related and it must take into account the effect of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option (defined below). Holistic evaluation does not mean that a project must be looked at as a whole. It rather means that it must be accepted that there is a whole into which a project introduced. If the indications are that the project could have major adverse effects, the project must be reconsidered and where appropriate re-planned or relocated to avoid an adverse impact or to ensure a beneficial impact.

26.2 Best Practicable Environmental Option

When it is necessary to undertake any action with environmental impacts, the different options that could be

considered for the purpose must be identified and defined. The Best Practicable Environmental Option (BPEO) is defined in NEMA as "the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term." Other guidelines typically used for environmental management in terms of other legislation include: BPM which is the Best Practicable Means and BAT which is the Best Available Technology.

26.3 Sustainable Development

The concept of sustainable development was introduced in the 1980's with the aim to ensure that the use of natural resources is such that our present needs are provided without compromising the ability of future generations to meet their own needs. The constitution of South Africa is built around the fact that everyone has the right to have the environment protected through reasonable legislative and other measures that secure ecologically sustainable development. The National Environmental Principles included in the NEMA require development to be socially, environmentally and economically sustainable.

26.4 Preventative Principles

The preventative principle is fundamental to sustainable development and requires that the disturbance to ecosystems and the pollution, degradation of the environment and negative impacts on the environment be avoided, or, where they cannot be altogether avoided, are minimised and remedied.

26.5 The Precautionary Principles

The precautionary principle requires that where there is uncertainty, based on available information, that an impact will be harmful to the environment, it is assumed, as a matter of precaution, that said impact will be harmful to the environment until such time that it can be proven otherwise. The precautionary principle requires that decisions by the private sector, governments, institutions and individuals need to allow for and recognize conditions of uncertainty, particularly with respect to the possible environmental consequences of those decisions. In South Africa, the DWA (then DWAF, now DWS) adopted a BPEO guideline in 1991 for water quality management and in 1994 in the Minimum Requirements document for waste management.

In terms of DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, the precautionary principle is defined as, "Where a risk is unknown; the assumption of the worst-case situation and the making of provision for such a situation." Here the precautionary principle assumes that a waste or an identified contaminant of a waste is "both highly hazardous and toxic until proven otherwise."

In the context of the EIA process in South Africa, the precautionary principle also translates to a requirement to provide sound, scientifically based, information that is sufficient to provide the decision-making authority with reasonable grounds to understand the potential impacts on the environment, the extent thereof and

how impacts could be mitigated. If such information is not adequate for this purpose, the relevant authority cannot be satisfied as is required and then the authority should require that further information be collected and provided.

26.6 Duty of Care and Cradle to Grave Principle

In terms of the NEMA Section 28, “Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.”

By way of example, the principle of “duty of care” in terms of waste management emphasizes the responsibility to make sure that waste is correctly stored and correctly transported, as it passes through the chain of custody to final point of disposal. This means that waste must always be stored safely and securely. The company removing and disposing of waste also holds the responsibility to hold the relevant licenses, and that waste is transported alongside the necessary paperwork.

“Cradle to Grave” refers to the responsibility a company takes for the entire life cycle of a product, service or program, from design to disposal or termination. In terms of the DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, “any person who generates, transports, treats or disposes of waste must ensure that there is no unauthorized transfer or escape of waste from his control. Such a person must retain documentation describing both the waste and any related transactions. In this way, he retains responsibility for the waste generated or handled.” This places responsibility for a waste on the Generator and is supported by the "Cradle to Grave" principle, according to which a "manifest" accompanies each load of Hazardous Waste until it is responsibly and legally disposed. This manifest is transferred from one transporter to the next along with the load, should more than one transporter be involved. Once the waste is properly disposed of at a suitable, permitted facility, a copy of the manifest must be returned to the point of origin.” Duty of Care offers one strategy to implement sustainable development.

26.7 Polluter Pays Principle

The "polluter pays principle" entails that the person or organization causing pollution is liable for any costs involved in cleaning it up or rehabilitating its effects. It is noted that the polluter will not always necessarily be the generator, as it is possible for responsibility for the safe handling, treatment or disposal of waste to pass from one competent contracting party to another. The polluter may therefore not be the generator but could be a disposal site operator or a transporter. Through the 'duty of care' principle, however, the generator will always be one of the parties held accountable for the pollution caused by the waste. Accordingly, the

generator must be able to prove that the transferal of management of the waste was a responsible action. The polluter pays principle acceding to NEMA dictates that "the cost of remedying pollution, environmental degradation and consequent adverse effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment."

26.8 Duty of Care Responsibilities

The principle of duty of care is especially important to understand when it comes to pollution that arises as a result of mining. Notwithstanding any licenses or permits that may exist, the mine still has a responsibility to take suitable measures should pollution arise as a result of the mining activities.

Training and awareness should be fostered in all staff working to ensure that they can perform their duties. Failure to comply with the provisions in the EMPR and NEMA would be a contravention of the Act. The relevant sections of NEMA are provided below, to outline the duty of care and responsibility that the applicant and all employees have towards the environment. The National Environmental Management Act (Act 107 of 1998) (NEMA) Section 28 makes provision for Duty of care and remediation of environmental damage. The binding principals are described below:

- Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.
- Without limiting the generality of the duty in subsection (1), the persons on whom subsection (1) imposes an obligation to take reasonable measures, include an owner of land or premises, a person in control of land or premises or a person who has a right to use the land or premises on which or in which-
- any activity or process is or was performed or undertaken or
    - any other situation exists, which causes, has caused or is likely to cause significant pollution or degradation of the environment.
- The measures required in terms of subsection (1) may include measures to-
    - investigate, assess and evaluate the impact on the environment.
    - inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment.
    - cease, modify or control any act, activity or process causing the pollution or degradation.ontain or prevent the movement of pollutants or the cause of degradation.

- eliminate any source of the pollution or degradation or
- remedy the effects of the pollution or degradation.

- No person may-
- unlawfully and intentionally or negligently commit any act or omission which causes significant or is likely to cause significant pollution or degradation of the environment.
- unlawfully and intentionally or negligently commit any act or omission which detrimentally affects or is likely to affect the environment in such manner or
- refuse to comply with a directive issued under this section.

Any person who contravenes or fails to comply with subsection (14) is guilty of an offence and liable on conviction to a fine not exceeding R1million or to imprisonment for a period not exceeding 1 year or to both such a fine and such imprisonment.

26.9 Failure to Comply with Environmental Considerations

Within the provisions of the relevant environmental legislation, there are a number of penalties for non-compliance or offences. Below a few extracts are presented for information purposes, however these must not be read in isolation and the reader is reminded that there are other acts that may be applicable to the relevant project:

- NEMA Section 24F(2): It is an offence for any person to fail to comply with or to contravene the conditions applicable to any environmental authorization granted for that listed activity. 24F(4) A person convicted for an offence under subsection 2 is liable to a fine not exceeding 5 million rand or to imprisonment not exceeding 10 years or to both such a fine and imprisonment
- NEMA Section 34(6): Whenever any manager, agent or employee does or omits to do an act which it had been his or her task to do, or to refrain from doing on behalf of the employer and which would be an offence under any provision listed in Schedule 3 (relates to all environmental related acts) for the employer to do or omit to do, he or she shall be liable to be convicted and sentenced in respect thereof as if he or she were the employer
- NWA Section 151 (1): “No person may fail to comply with any condition attached to a permitted water use (Water Use License)”
- NWA Section 151 (2): “Any person who contravenes any provision of subsection 1 is guilty of an offence and liable, on the first conviction, to a fine or imprisonment for a period not exceeding 5 years or to both a fine and such imprisonment (10 years for second conviction)”
- In addition, if anyone is convicted of an offence under the act which has resulted in harm, loss or damage to any other person, the court may award damages to be paid by the accused or convicted

- NWA Section 154: Makes provision that it's not only the applicant that may be liable but also an employee or agent acting on their behalf
- In terms of the MPRDA, Section 98, any person is guilty of an offence if he or she fails to comply with the requirements of the issued mining permit
- MPRDA Section 99 (1a): any person convicted of an offence in terms of the MPRDA is liable to a fine not exceeding R100, 000 or to imprisonment to a period not exceeding 2 years or to both such fine and imprisonment.

It is recommended that a procedure for non-compliances (i.e. incentives or disincentives for conformance and non-conformance with the EMPR requirements) must be employed to ensure that the EMPR is adequately implemented. The system to be used must be determined before mining commences, included in the tender documents and contracts, and made clear to all project workers. The system may include that the independent ECO can be authorised to impose spot fines on the Contractor and/or his subcontractors for any of the transgressions detailed below:

- Littering on site
- Lighting of illegal fires on site
- Persistent or un-repaired oil leaks
- Any persons, vehicles or equipment related to the Contractor's operations found within the designated "No - Go" areas
- Any vehicles being driven in excess of designated speed limits
- Removal and/or damage to fauna, flora or heritage objects on site
- Legal contraventions

Such fines should be issued in addition to any remedial costs incurred as a result of non-compliance with the Environmental Specifications and or legal obligations.

27 DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

27.1 Determination of Closure Objectives

The vision, and consequent objective and targets for rehabilitation, decommissioning and closure, aim to reflect the local environmental and socio-economic context of the project, and to represent both the corporate requirements and the stakeholder expectations.

The receiving environment within which the mining activities will be undertaken includes the following key land uses:

- Low shrubland.
- Grassland.

Concerns raised by the stakeholders consulted during the public participation process for the basic assessment have been taken into consideration and will be included in the final BAR and EMPR which will be submitted to the DMRE.

In practice the post closure land-use will depend on the pre-mining land use of the study area. Considering that the exact location of the planned mining have been identified and assessed, it can be said that the closure plan will sufficiently address the objectives for the site. This EMPR does, however, aim to address the key closure objectives which are likely to remain consistent for the majority of the mining activities.

The EMPR includes a monitoring and a rehabilitation plan. The plan shall outline the closure objectives which are aimed at reinstating the landform, land use and vegetation units to the same as before mining operations take place unless a specific, reasonable alternative land use is requested by the landowner. As such, the intended end use for the disturbed mining area and the closure objectives will be defined in consultation with the relevant landowner. Proof of such consultation will be submitted together with the Application for Closure Certificate. The overall aim of the rehabilitation plan is to rehabilitate the environment to a condition as close as possible to that which existed prior to mining.

This shall be achieved with a number of specific objectives.

- Making the area safe. i.e. decommission mining activities so as to ensure that the environment is safe for people and animals. This entails refilling excavations, etc.
- Recreating a free draining landform. This entails earthworks infilling, reshaping, levelling, etc. to recreate as close as possible the original topography and to ensure a free draining landscape.
- Re-vegetation. This involves either reseeding or allowing natural succession depending on the area, climate etc.
- Storm water management and erosion control. Management of stormwater and prevention of erosion during rehabilitation. E.g. cut off drains, berms etc. and erosion control where required.
- Verification of rehabilitation success. Entails monitoring of rehabilitation.

27.2 Volumes and Rate of Water Use Required for the Operation

Limited water will be consumed by the surface dust suppression activities (water mist added for dust suppression when required), approximately 18000 liters per day.

27.3 Has a Water Use License Been Applied For?

Water use licence will be applied for.

28 IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

Table 29: Impacts to be mitigated.

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Environmental Management					
General opencast management	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	The small-scale mine shall ensure that social and environmental human resources have the knowledge, skills, and experience necessary to perform their work with competence and efficiency.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout
General opencast management	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	The small-scale mine shall appoint a suitably qualified and competent Environmental Control Officer (ECO) who shall preferably be independent from the Applicant and the Contractor. The ECO must preferably have a tertiary qualification in an Environmental Management or appropriate field. The ECO should have appropriate qualification and	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

			experience in the implementation of environmental management specifications. The ECO shall be tasked with auditing the mines environmental compliance on a regular basis (annually). The Applicant shall provide		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			the ECO with the necessary support to ensure that the environmental aspects relating to the development is adhered to.		
General opencast management	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	All contractors and sub-contractors must have a copy of this EMPR at the point of use and should be briefed by the Pit Environmental Officer (EO) or ECO with regards to the use and implementation of the EMPR.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout
General opencast management	Planning and Design Construction Operation Decommissioning Rehabilitation and	No direct physical disturbance	The EMPR must be binding for all contractors operating on behalf of the Mining Permit Holder.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

	Closure				
General opencast management	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	The small-scale mine shall ensure that all sub-contractors working under the main mining contractor abide by the requirements of the EMPR through the inclusion of the EMPR and applicable environmental requirements in contractual agreements for all sub-contractors.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Health and Safety					
General opencast management	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Health and safety risks are classified as high significance due to the value of human life	The small-scale mine shall ensure that reasonable measures are taken to ensure the safety of all site staff, including induction training for all employees and visitors.	OHS MHSA	Throughout
General opencast management	Construction Operation	Health and safety risks are classified	The small-scale mine shall provide appropriate Personal Protective	OHS MHSA	Throughout

	Decommissioning Rehabilitation and Closure	as high significance due to the value of human life	Equipment (PPE) to employees wherever required and in accordance with the risks associated with their activities.		
General opencast management	Construction Operation Decommissioning Rehabilitation and Closure	Health and safety risks are classified as high significance due to the value of human life	The small-scale mine shall undertake safety audits to ensure compliance with the (i) Occupational Health and Safety Act (Act No. 85 of 1993) and associated regulations and (ii) Mine Health and Safety Act (Act 29 of 1996) as amended and associated regulations.	OHS MHSA	Throughout
General opencast management	Construction Operation Decommissioning Rehabilitation and	Health and safety risks are classified as high significance due to the value of	The small-scale mine shall implement a safety reporting procedure to ensure that all accidents and incidents (safety and environmental) are recorded and	OHS MHSA	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Closure	human life	reported to the pit manager and EO.		

General opencast management	Construction Operation Decommissioning Rehabilitation and Closure	Health and safety risks are classified as high significance due to the value of human life	Any containers in which hazardous substances (e.g. fuel, paints, solvents) are stored shall be clearly marked as to the contents therein (in accordance with OHSA regulations).	OHS MHSA	Throughout
Site Access and Security					
General opencast management	Construction Operation Decommissioning Rehabilitation and Closure	Security risks can have a highly significant impact although minimise.	On-site vehicles must be limited to approved access routes and areas (including turning circles and parking) on the site so as to minimise excessive environmental disturbance to the soil and vegetation off site, and to minimise disruption of traffic.	OHS MHSA	Throughout
General opencast management	Construction Operation	The creation of roads can have a significant and relatively widespread impact, especially as roads create corridors	Any new access (if required) shall first be approved by the pit manager and ECO (method statement may be required) and should be provided with erosion and silt pollution prevention measures where required.	OHS MHSA	Throughout
General opencast management	Construction Operation Decommissioning	Security risks can have a highly significant impact	No person will be allowed to keep or use alcohol, recreational drugs, traditional or modern weapons, snares	OHS MHSA	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Rehabilitation and Closure	although localised	or otherwise dangerous objects on-site, or to enter the site while under the influence of alcohol or drugs.		
Environmental Awareness					
General opencast management	Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	All employees and visitors to the site must undergo a site induction which shall include basic environmental awareness and site specific environmental requirements (e.g. site sensitivities and relevant protocols/procedures). This induction should be presented or otherwise facilitated by the Contractors EO/Pit EO wherever possible.	NEMA	Throughout
Social and Socio-Economic					
General opencast management	Planning Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	The small-scale mine shall develop and implement a recruitment policy that allows equal opportunity to all people (woman, disabled) and give preference to local labour from the local Municipality.	Adherence to corporate policies and compliance with legislation including Labour Act and Employment Act	Throughout

General opencast management	Planning Construction Operation Decommissioning	No direct physical disturbance	The procurement policy for the mine should focus on utilising service providers from the local area so as to encourage the growth of businesses.	Adherence to corporate policies and compliance with legislation including Labour Act and	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Rehabilitation and Closure			Employment Act	
General opencast management	Planning Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	The small-scale mine shall attempt, where possible, to recruit local service providers and contractors to undertake construction activities.	Adherence to corporate policies and compliance with legislation including Labour Act and Employment Act	Throughout
General opencast management	Planning Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	The small-scale mine and contractor(s) shall comply with all relevant legislation pertaining to labour recruitment and employment.	Compliance with legislation including Labour Act and Employment Act	Throughout

General opencast management	Planning Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	The small-scale mine shall appoint a community liaison officer that deals specifically with the surrounding communities. The mine shall communicate frequently with the affected stakeholders to ensure that they understand the processes and do not develop more unrealistic expectations.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Appointment as early as possible and implemented throughout
General opencast management	Planning Construction Operation	No direct physical disturbance	The small-scale mine shall establish a detailed grievance mechanism for communities to lodge concerns,	Shall adhere to the ESMS Framework guided by	Developed as early as possible and

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation

	Decommissioning Rehabilitation and Closure		suggestions and grievances which can be dealt with by the Project in a timely manner. The grievance mechanism shall aim to accomplish the following objectives: • Receive and register external communications from the public. • Screen and assess the issues raised and determine how to address them. • Identify roles and responsibilities relating to the reporting, recording and addressing of grievances. • Maintenance of a grievance register to record and track, and document responses and actions taken to address grievances. • Reporting of grievances to DMRE. • Adjust the management program, as appropriate.	Equator Principles, and IFC Performance Standards	implemented throughout
General opencast management	Planning Construction Operation Decommissioning	No direct physical disturbance	A grievance register must be maintained by the mine to log grievances from landowners, communities, occupants and other	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance	Developed as early as possible and implemented throughout

	Rehabilitation and		Interested and Affected Parties, and		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Closure		response to such grievances. The grievance register should be provided to authorities at any point in time if so requested. The grievance register shall contain, at a minimum, the following information: • Date of the grievance being lodged. • Location relating to the grievance. • Contact details of the complainant. • Grievance description (detailed as possible). • Person receiving grievance. • Agreed corrective action. • Responsible party for corrective action. • Summary of actions taken (and date action was taken).	Standards	
General opencast management	Planning Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	Employees should be sourced from the local area where possible.	Adherence to corporate policies and compliance with legislation including Labour Act and Employment Act	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
General opencast management	Operation	No direct physical disturbance	The workforce should undergo up- skilling during the operation of the mine so that they may be productively absorbed into the local economy after mine closure.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	During operation
General opencast management	Planning Construction Operation Decommissioning Rehabilitation and Closure	No direct physical disturbance	Stakeholder engagement will continue throughout to ensure local communities are kept informed and allowed to raise issues. These issues will then be addressed through the grievance mechanism.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout
General opencast management	Operation	No direct physical disturbance	Where retrenchments are unavoidable, they should be managed humanely according to legislative requirements.	Legislative requirements	When retrenchments are required
General opencast management	Operation	No direct physical disturbance	Upon closure, the contracting company for the mining operations should attempt to redeploy employees to its other operations.		As required when scaling down operations and prior to closure
Site Establishment					

Construction camp sewage management Dust suppression	Construction	Construction impacts are temporary in nature and have a limited	The physical footprint of any construction or site camp shall be minimised and vegetation clearance should be kept to the minimum required	Shall adhere to the ESMS Framework guided by Equator Principles and IFC Performance	Throughout construction

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Earthworks Fencing Fuel storage and refueling Hazardous substances management Site security Soil management Truck and heavy machinery operation Utilisation of portable toilets and generation of sewage		extent but may include significant impacts	area. Topsoil shall be handled in accordance with the soil management principles presented in this EMPR and the soil management guide developed for the Mine. All construction and/or site camps shall be enclosed with a fence. The mesh size should be small enough for the fence to act as a catch net for blown debris and as a demarcation of the site. The fence shall be maintained as required to ensure access control remains effective. All temporary fences erected by the contractor shall be removed and the site restored on completion of construction, unless otherwise agreed in writing with the	Standards OHSA MHSA NEMA MPRDA	

			Applicant.		
Vegetation clearance			Site and construction camps must be kept in a clean, neat and tidy condition at all times. The contractor shall maintain good housekeeping practises and shall comply with the relevant HSE regulations in terms of materials storage. Stockpiles of construction materials may only be placed within		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			demarcated areas within the construction camp. Laydown areas must be kept neat and tidy and free of litter or waste at all times.		

			A waste storage area must be established within the site camp/construction camp that provides for appropriate and adequate waste storage and waste separation for recycling. All waste must be adequately contained so as to prevent ground and/or water pollution. The total volume of general waste stored shall not exceed 100 m3. In the case that a storage capacity exceeding this amount is required or planned for, the necessary waste permits must be obtained in accordance with the NEMWA beforehand (GN 718).		
			The site camp/construction camp shall have adequate provision for the storage of hazardous waste (e.g. old oil filters, soil from spills etc.) and the waste shall be contained within closed containers to prevent the possibility of spillages.		
			All fuel storage areas shall be bunded.		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			Fuel storage areas may not be located within 100 m of the watercourse and the total volume of fuel stored on site may not exceed 30 m3 (30 000 liters) without the necessary authorisation in terms of the NEMA. Fuel storage areas must be provided with an impervious surface with the provision to contain any potential fuel spillages during re-fueling (e.g. a bunded, sealed concrete slab which drains to a sump/oil separator). No person smoke or take part in any activity that may results in sparks in the vicinity of fuels and other flammable substances to prevent ignition.		

			All hazardous substances shall be stored within designated areas that comply with the relevant HSE standards (e.g. access control, HSE signage, fire-fighting equipment etc.) and that provide for spill prevention and containment. It is recommended that a dedicated, bunded and fenced Hazardous Storage Area is provided within the construction camp for this		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			purpose.		
			Site camps/construction camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and this equipment must be readily accessible.		
			No open fires shall be permitted within the site camp/construction camp, except where approved by the responsible safety officer and ECO and within a designated structure designed for that purpose. In such cases fire fighting equipment must be readily available in the vicinity of the fire place and an appropriate safety representative should be present at all times during burning of the fire. All fires shall be fully extinguished after use.		
Flora					

General surface rehabilitation Infrastructure removal Maintenance and operation of site	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high	The small-scale mine, in consultation with the ECO, shall develop an appropriate weed management plan, to be implemented throughout the lifespan of the project. The weed management plan shall aim to eradicate and control	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by	Development of plan as soon as possible and implementation throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
infrastructure and facilities Mining Permit area site preparation Filling opencast voids Post closure monitoring and maintenance		significance	alien vegetation in accordance with NEMBA. Control involves killing the plants present, killing the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Specialist input shall be sought in developing the plan to ensure the potential for residual or latent impacts	Equator Principles IFC Performance Standards	

Site establishment			resulting from alien vegetation removal are minimised and mitigated. The weed management plan shall include appropriate measures for removal/control of alien vegetation across the entire site. The weed management plan shall include the following measures as a minimum: • Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act or in terms of Working for Water guidelines.		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• Institute an eradication/control programme for early intervention if invasive species are detected, so that their spread to surrounding natural ecosystems can be prevented. • Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds (including closure and post closure monitoring). • The Plan must clearly define the areas from which alien vegetation must be removed as well as the plant, equipment, materials and methodology to be used		
	Planning and Design Construction	Impacts on red data species has a very high significance	All Red Data Plants within the Mining Permit area, roads and all other infrastructure areas should be transplanted and relocated within either	NEMBA Threatened or Protected Species (TOPS) regulations	Prior to commencement of activities or disturbance

	Operation				

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			a nursery or any neighbouring piece of land where it can be conserved until rehabilitation can take place. These species can either be replanted during the rehabilitation process of the Opencast pit mining areas as rehabilitation of mined out areas progresses, or left in their new location if this is not to be disturbed in future.	National Forests Act DAFF permitting requirements	
	Planning and Design Construction Operation	Impacts on red data species has a very high significance	The small-scale mine shall ensure that the relevant permits are obtained to remove and relocate protected species. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetate impacted areas as soon as possible.	NEMBA TOPS regulations National Forests Act DAFF permitting requirements	Prior to commencement of activities or disturbance

	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high significance	No unnecessary clearing of vegetation will take place, to enable seeds from undisturbed areas to move into disturbed area through natural processes of succession.	NEMA	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high significance	The small-scale mine shall plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetate impacted areas as soon as possible. Allow pioneer species to establish in disturbed areas. Erosion prevention measures will be implemented along infrastructure areas.	NEMA CARA	Throughout

	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high significance	The harvesting of plants by construction and mine workers is prohibited on site. This includes the harvesting of plants for firewood, construction material, the making of crafts and medicinal purposes.	NEMA	Throughout
	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high significance	Damage or harm to threatened plant species is illegal in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004). Threatened species are defined in terms of the most recent Red Data list of Southern African Plants. Employees	NEMBA TOPS regulations National Forests Act DAFF permitting requirements	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			and workers shall be educated with regards to any potential threatened species that may be encountered on site, and shall take the necessary actions to prevent of harm to any such species found on site.		
	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high significance	All alien vegetation occurring on the site must be controlled in accordance with NEMBA. The area should be assessed and the alien invasive species controlled prior to the commencement of the construction activities. The area should be monitored for the establishment and spread of alien invasive species throughout. The weed management plan and principles for weed management presented in this EMPR must be implemented throughout the lifespan of the project.	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

	Constructio n Operation	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high significance	All soil stockpiles shall be kept free of any weeds or alien invader plant species.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high significance	Alien species removal must take place in an appropriate manner, which includes: • Avoid disturbance to the soil. • Use an appropriate control for each species. Some species may require manual and herbicide control. • Where appropriate, use biological control. • Where herbicide control is used, ensure that the correct herbicide as registered for the species is used. • Use only herbicides that are registered for use near water close to the wetland areas. • In most cases herbicide control is only successful in the growing season. All herbicides must be applied appropriately.	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high	Where large clumps of invasive trees are to be controlled, do not clear all invasive species at once, since this will lead to large areas bare of vegetation and may lead to erosion and a large sediment load in the adjacent water	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by Equator Principles, and	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
		significance	resources. Aliens must be removed gradually over a long period and the trees replaced with grassland.	IFC Performance Standards	
	Rehabilitation and Closure	Impacts on flora may occur over a large area (active mine areas) and has the potential to be a relatively high significance	The small-scale mine should consider the use of excess vegetation (tree stumps etc.) to create 'safe sites' for seedling recruitment as well as animal habitats in rehabilitated areas.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	During Rehabilitation
	Rehabilitation and	Impacts on flora	Disturbed surfaces will be re-vegetated	Adherence to	During

	Closure	may occur over a large area (active mine areas) and has the potential to be a relatively high significance	as soon as they become available, by seeding with an appropriate seed mix as per direction by a vegetation specialist.	Rehabilitation and Closure Plan	rehabilitation
Fauna					
General surface rehabilitation	Planning and Design Construction Operation Decommissioning	Impacts on fauna has the potential to be a relatively high significance	Visitors and workers will be informed that the killing of fauna is prohibited within the boundaries of the mining area, as well as neighbouring areas.	Induction training shall comply with ESMS Framework guided by Equator Principles, and	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Filling opencast voids Post closure monitoring and maintenance Site establishment	Rehabilitation and Closure	especially where threatened or protected species are impacted upon		IFC Performance Standards	
	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on fauna has the potential to be a relatively high significance especially where threatened or protected species are impacted upon	The small-scale mine shall educate and inform all workers, contractors and visitors about any rare and endangered species through an environmental awareness plan and the distribution of posters, containing pictures of any potential rare and endangered species.	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout
	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on fauna has the potential to be a relatively high significance especially where threatened or protected species are impacted upon	The sighting of any rare or endangered species needs to be reported to management which will keep record of all such species. Should there be a risk of an impact to such a species, the mine shall notify a specialist who shall advise on the best course of action. Should relocation or destruction of any species be required, the necessary	NEMBA TOPS Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

			permits shall be obtained.		
	Constructio n Operation	Impacts on sensitive landscapes have the potential to be	The destruction of sensitive landscape features shall be avoided where possible and otherwise minimised through effective planning. In areas	In accordance with Rehabilitation and closure plan	During construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
		a relatively high significance with widespread effects	where the destruction cannot be avoided, these features should be re- introduced in the post mining landscape.		
	Constructio n Operation	Impacts on sensitive landscapes have the potential to be a relatively high significance with widespread effects	Infrastructure should be designed to rather follow the edge of natural areas than crossing it. If crossing it is the only option, then the area should be transected so that one large area remains rather than two equally sized areas. Infrastructure should be condensed to prevent unnecessary sprawl into sensitive areas.	In accordance with Rehabilitation and closure plan	During construction and operation

	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on fauna has the potential to be a relatively high significance especially where threatened or protected species are impacted upon	No construction workers or mine employees may disturb, hunt, set traps/snares, utilise dead or alive fauna/livestock/wildlife/fish. This includes the killing of any animal caught in construction works. No construction workers or mine employees may collect or remove firewood or medicinal plants or other plants/crops/fruits from the site or areas adjacent to the site. Disciplinary action must be taken in the event that any flora or fauna is willfully disturbed or killed.	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on fauna has the potential to be a relatively high significance especially where threatened or protected species are impacted upon	Any animals found within excavations should be carefully returned without harm to an adjacent area away from potential harm, but preferably not further than 200 m away from where it was found unless otherwise agreed to by the ECO.	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout
	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on fauna has the potential to be a relatively high significance especially where threatened or protected species are impacted upon	The contractor shall ensure that any snakes discovered in excavated areas, on or near the construction site are not killed or otherwise harassed. The Pit EO must be notified should a snake be found on or near the site. The Pit EO will be responsible to ensure that an appropriately skilled person is summoned to remove the snake from the site for relocation to a suitable nearby location.	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on fauna has the potential to be a relatively high significance especially where threatened or protected species	The small-scale mine shall take the necessary measures to limit the speed of trucks and vehicles on the roads on site and enforce these speed limits.	Internal speed limits for haul roads and declared legal speed limits for public roads	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
		are impacted upon			
	Planning and Design Construction Operation Decommissioning	Impacts on fauna has the potential to be a relatively high significance especially where threatened or protected species are impacted upon	Any Red Data species recorded within the areas that will be cleared for the newly Opencast pit mining areas should be relocated within re- vegetated areas where a good vegetation cover has been established. The mine must ensure relevant permits are in place if any threatened or protected species are relocated.	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout
	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Impacts on fauna has the potential to be a relatively high significance especially where threatened or protected species are impacted upon	No person should willfully disturb the movement of any mammals, birds, amphibians, insects or reptiles on the mine site.	NEMA NEMBA CARA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout
Soils					

Filling opencast voids General decommissioning activities	Construction Operation Decommissioning	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can	Topsoil shall be removed from all areas where physical disturbance of the surface will occur (up to a maximum of 30 cm depth). Topsoil must be stockpiled for re-use in subsequent rehabilitation activities outside of areas	CARA NEMA GN704 In accordance with Rehabilitation and closure plan	As required

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
General surface rehabilitation Infrastructure removal		in turn affect land use and land capability	prone to erosion and 1:100 year floodplain demarcation.		
Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Re-vegetation Site establishment	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability	Soils must be stripped from the area of activity. Topsoils and subsoils should be stripped separately. The stripped soils should be utilised to create a berm up-slope of the proposed development area to divert runoff water around the site. Re-vegetate any bare soil immediately. Activity should be limited to area of disturbance. Where required the compacted soils should be ripped to an adequate depth and re- vegetated with indigenous plants.	CARA NEMA In accordance with Rehabilitation and closure plan	As required

	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability	To the greatest extent possible topsoil shall only be handled twice, only-once during the initial stripping of topsoil and a second time to replace it.	CARA NEMA In accordance with Rehabilitation and closure plan	Throughout
	Construction Operation	Impacts on soils can have	It must be ensured that the topsoil is separated from the subsoil and that the	CARA NEMA	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
		significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability	topsoil is stockpiled separately from the subsoil and construction materials.	In accordance with Rehabilitation and closure plan	
	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability	Topsoil and sub-soil stockpiles must be located such that the potential for erosion is minimised. Areas with existing erosion and stability issues must be avoided. Topsoil stockpiles will not be placed within the 1:100 year floodline of a water course, and will not be placed within the path of a stormwater channel, and if necessary, will be provided with a silt fence around the perimeter of the foot of the stockpile. Stockpiles are to be stabilised if signs of erosion are visible. Any evidence of erosion, scouring,	CARA NEMA GN 704 In accordance with Rehabilitation and closure plan	Throughout

			sedimentation, and/or undercutting must be rectified and rehabilitated immediately.		
	Construction Operation	Impacts on soils can have	There must be no contamination of topsoil. The biological, chemical and	MPRDA CARA	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Decommissioning Rehabilitation and Closure	significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability	physical properties of the topsoil must not be changed by introducing detrimental foreign material, gravel, rock, rubble or mine residue to such soil (MPRDA Regulation 70(7)). This also includes littering, waste disposal, fuel or chemical contamination, plant matter dumping or other activity occurs that may introduce pollutants or foreign plant species into stockpiled soils. Material laydown areas and stockpiles of construction materials must be clearly separated from topsoil stockpiles in order to limit any contamination of the topsoil.		

	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability.	Care must be taken to protect topsoil resources on site and thereby avoid the need to obtain additional topsoil from outside the site for rehabilitation. However, in the event that additional topsoil needs to be sourced from outside the site, this shall be done with extreme caution not to introduce any alien or invasive species to the site.	NEMBA NEMA	Throughout
	Construction Operation	Impacts on soils can have	Compacting of soil must be avoided as far as possible. The contractor should	MPRDA CARA	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Decommissioning Rehabilitation and Closure	significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability.	restrict the use of heavy machinery, particularly in areas outside of the physical mining footprint area to reduce the compaction of soils. No vehicles or machines will be allowed to drive over or be parked on the topsoil stockpiles.		

	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability.	Stockpiles and berms should be vegetated with a suitable seed-mix.	MPRDA CARA	As required
	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability.	A monitoring system shall be implemented which will include inspecting soil stockpiles and berms for any degradation or erosion, and ensure immediate action if these are noted.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Ongoing throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability.	The regular inspections shall aim to identify negative effects such as acidification and erosion of cover-soil, poor quality leachate seeping from the residue deposits and deterioration of vegetation cover. The mine shall take measures to re-vegetate any bare soil immediately.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Ongoing throughout
	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability	Trucks, machinery and equipment will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using spill kits or as per the emergency response plan. For large spills a hazardous materials specialist shall be utilised.	NEMA NWA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Ongoing throughout

	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land	Accidental hydrocarbon spillages should be reported immediately, and then the affected soil should be removed, and rehabilitated or if this is not possible, disposed of at a waste sites designated to accept such waste.	NEMWA DWAF minimum requirement for waste disposal	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
		capability			
	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability	Activity should be limited to area of disturbance. This can be encouraged by pegging out the area of activity. Where required the compacted soils should be disked/ripped to an adequate depth and re- vegetated with indigenous plants.	In accordance with Rehabilitation and closure plan	Throughout

	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land use and land capability	All vehicles will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using spill kits or as per the emergency response plan.	NEMWA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout
	Rehabilitation and Closure	Impacts on soils can have significant impact both in terms of severity and scale. Impacts on soil can in turn affect land	The small-scale mine shall reinstate the soil over the open cast mining areas to the following standards at least 1.5 m deep, preferably the same as before construction in the correct soil profile order add mulching.	In accordance with Rehabilitation and closure plan	During rehabilitation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
		use and land capability	and soil stabilisation measures ensure that the vegetation cover is as evenly spaced as possible with an initial basal cover of at least 15% with pioneer species.		
Land use					
General surface Rehabilitation Infrastructure removal Mining Permit area	Constructio n Operation	Impacts on alternative land uses are considered highly significant and can occur over a large area	Soil stockpiles shall be designed to have free drainage of water with minimal soil erosion potential.	MPRDA	Throughout
site preparation Opencast mining Filling opencast voids Storm water management	Operation	Impacts on alternative land uses are considered highly significant and can occur over a large area	The ongoing rehabilitation should occur soon after the area has been mined out so that alternative land use can commence.	In accordance with Rehabilitation and closure plan	During rehabilitation

construction	Rehabilitation and Closure	Impacts on alternative land uses are considered highly significant and can	Rehabilitation should follow procedures with regard to seed bed preparation and fertilising, and advice on seed mixtures to seed with.	In accordance with Rehabilitation and closure plan	During rehabilitation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
		occur over a large area.			
	Operation Decommissioning Rehabilitation and Closure	Impacts on alternative land uses are considered highly significant and can occur over a large area.	Rehabilitated areas should be mowed or grazed (where appropriate) as soon as they become available.	In accordance with Rehabilitation and closure plan	During rehabilitation
	Operation Decommissioning Rehabilitation and Closure	Impacts on alternative land uses are considered highly significant and can occur over a large area.	Areas that have been rehabilitated and are suitable for grazing must be fenced off from the adjacent mining areas and made available to landowners.	In accordance with Rehabilitation and closure plan	During rehabilitation
	Operation Decommissioning Rehabilitation and Closure	Impacts on alternative land uses are considered highly significant and can occur over a large area.	The post mining land use must be predetermined in order to ensure it is rehabilitated to suit the use of the land.	In accordance with Rehabilitation and closure plan	Established early during operations and implemented during rehabilitation
Pollution Prevention					

General	Construction	Small scale and	Vehicles/machinery will be regularly	NEMA Polluter Pays	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
decommissioning activities General surface Rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Filling opencast voids Post closure monitoring and maintenance Re-vegetation	Operation Decommissioning Rehabilitation and Closure	localised	serviced to reduce risk of leaks. Drip trays will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. For large spills a hazardous materials company (specialist spill cleanup company) will be appointed.	Principle NEMA Duty of Care NWA OHSA MHSA Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	operations
	Construction Operation Decommissioning Rehabilitation and Closure		Any equipment that may leak, and does not have to be transported regularly, shall be placed on watertight drip trays to catch any potential spillages of pollutants. The drip trays shall be of a size that the equipment can be placed inside it. Daily inspections shall be carried out to ensure such spill prevention measures are in place and remain effective. Drip trays shall be cleaned regularly and shall not be allowed to overflow. All spilled hazardous substances must be collected and adequately disposed of at a suitably licensed facility.		

	Construction Operation Decommissioning		Appropriate measures must be implemented to ensure that rainwater does not run into areas containing		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			cement, oil, diesel etc. as this could result in a pollution threat. Storage areas for these substances should be placed on high-lying ground, and surrounded by erosion control measures e.g. rows of filled hessian bags, silt fences etc.		
	Construction Operation Decommissioning Rehabilitation and Closure		Servicing and maintenance of vehicles may only take place in the workshop area (subject to suitable spill prevention and containment measures). If emergency repairs are required elsewhere on site, this shall be undertaken with the necessary spill prevention measures in place.		
	Construction Operation		Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. As a result, the contractor shall		

			ensure that: Concrete shall only be mixed on mortar boards, and not directly on the ground The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			disposed of as waste, (Washing of visible signs into the ground is not acceptable). All excess aggregate shall also be removed.		
	Construction Operation Decommissioning Rehabilitation and Closure	Small scale and localised	All hazardous substances (e.g. fuel, grease, oil, brake fluid, hydraulic fluid) must be handled, stored and disposed of in a safe and responsible manner so as to prevent pollution of the environment or harm to people or animals. Appropriate measures must be implemented to prevent spillage and appropriate steps must be taken to prevent pollution in the event of a spill.		
	Construction Operation Decommissioning Rehabilitation and Closure	High significance and potentially a moderate scale disturbance	Hazardous substances shall be confined to specific and secured areas, and in such a way that does not pose any danger of pollution even during times of high rainfall. Hazardous storage areas shall be bunded (impermeable) with adequate containment (at least 110% the largest volume stored) for potential spills or leaks. Bunded storage areas shall be either be provided with an oil separator	NEMA Polluter Pays Principle NEMA Duty of Care NEMA NWA OHSA MHSA	Throughout operations

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			or sump. Waste from spillages will then be removed and recycled or disposed of responsibly.	Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	
	Construction Operation Decommissioning Rehabilitation and Closure	High significance and potentially a moderate scale disturbance	All fuel storage areas shall be bunded to contain at least 110 % of the volume stored and will comply with the relevant environmental and safety regulations. Fuel storage areas must be provided with an impervious surface with the provision to contain any potential fuel spillages during refueling (e.g. a sealed concrete slab which drains to a sump/oil separator). The applicant and Contractor(s) must ensure that employees and labourers do not smoke or take part in any activity that may results in sparks in the vicinity of fuels		

			and other flammable substances to prevent ignition.		
	Construction Operation Decommissioning Rehabilitation and Closure	High significance and potentially a moderate scale disturbance	Refueling may only take place within a dedicated area inside the mine that is subject to appropriate spill prevention and containment measures refueling and transfer of hazardous chemicals and other potentially hazardous substances must be carried out so as to		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			minimise the potential for leakage and to prevent spillage onto the soil. Drip trays should be utilised in relevant locations (inlets, outlets, points of leakage, etc.) during transfer so as to prevent such spillage or leakage. Any accidental spillages shall be contained and cleaned up promptly.		
	Construction Operation Decommissioning	High significance and potentially a moderate scale disturbance	Any excess or waste material or chemicals should be removed from the site and should preferably be recycled (e.g. oil and other hydrocarbon waste products). Any waste materials or chemicals that cannot be recycled shall be disposed of at a suitably licensed waste facility.	NEMWA DWAF minimum requirement for waste disposal	Throughout operations
	Construction Operation Decommissioning Rehabilitation and Closure	High significance and potentially a moderate scale disturbance	Hazardous waste may only be disposed of at a licensed hazardous waste disposal facility. A specialist waste contractor shall dispose of such waste and shall be required to provide waste manifests and safe disposal certificates. The 'cradle-to-grave' principle must be complied with.	NEMA Polluter Pays Principle NEMA Duty of Care NEMWA DWAF minimum requirement for waste disposal	Throughout operations

	Construction Operation	Potential health risks are	All relevant personnel on site must be properly trained concerning the proper	MSDS specifications OHSA	Throughout operations

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Decommissioning Rehabilitation and Closure	considered high significance	use, handling and disposal of hazardous substances applicable to their line of work. If required, advice shall be obtained from the manufacturer with regard to the safe handling and storage of hazardous materials.	MHSA	
	Construction Operation Decommissioning	Small scale and localised	The contractor shall supply the Pit EO with a list of all hazardous materials that would be present on site during the construction period. The same applies to any sub-contractor that should provide the contractor with this information. The Pit EO shall develop and maintain a hazardous substance register for all hazardous materials that shall be kept on site during all phases of the project. The register shall be provided to the ECO upon request. Material Safety Data Sheets (MSDS) must be available on site at the point of use and readily accessible for all. hazardous substances stored.	OHSA MHSA	Throughout operations
Waste Management					
Maintenance and	Construction	Waste has the	The small-scale mine shall develop and	NEMWA	Throughout

operation of site	Operation	potential to pollute	implement a waste management plan	NEMA Cradle to Grave	operations

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
infrastructure and facilities Infrastructur e construction General construction Mining Permit area site preparation	Decommissioning Rehabilitation and Closure	the environment and can vary from localised to large scale impacts	which complies with the principles of the NEMWA and provides a mechanism for the effective management of waste throughout. This plan shall ensure the appropriate management of all solid waste, including construction debris (cement bags, wrapping material, timber, cans, wire, nails, etc.), waste and surplus food, food packaging, organic waste etc.	DWAF minimum requirement for waste disposal Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	
General opencast management Opencast mining General decommissioning activities	Construction Operation Decommissioning Rehabilitation and Closure	Waste has the potential to pollute the environment and can vary from localised to large scale impacts	The waste management system shall provide for adequate waste storage (in the form of waste skips and bins with lids), waste separation for recycling, and frequent removal of non-recyclable waste for permanent disposal at an appropriately licensed waste disposal facility. No waste material is to be disposed of on site. Under no circumstances may there be any burial of waste underground or on the site.	NEMWA NEMA Cradle to Grave DWAF minimum requirement for waste disposal	Throughout operations
Infrastructure removal	Construction Operation Decommissioning	Waste has the potential to pollute the environment and can vary from	Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be	NEMWA NEMA Cradle to Grave DWAF minimum requirement for waste	Throughout operations

	Rehabilitation and		stored		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Closure	localised to large scale impacts	on site for excessive periods to reduce risk of environmental contamination.	disposal	
	Construction Operation Decommissioning Rehabilitation and Closure	Waste has the potential to pollute the environment and can vary from localised to large scale impacts	The small-scale mine shall implement a waste removal regime that ensures waste skips do not exceed their capacity before being removed from site for disposal.	NEMWA NEMA cradle to grave	Throughout operations
	Construction Operation Decommissioning Rehabilitation and Closure	Waste has the potential to pollute the environment and can vary from localised to large scale impacts	Littering shall be strictly prohibited. The site shall remain in a neat and tidy condition at all times. If required, the mine shall make use of regular litter patrols to remove litter and ensure the site remains clean, neat and tidy.	NEMWA NEMA Cradle to Grave	Throughout operations
	Construction Operation Decommissioning Rehabilitation and Closure	Waste has the potential to pollute the environment and can vary from localised to large scale impacts	The small-scale mine shall maintain a waste register which shall be used to track all waste removed from site. Proof of appropriate waste disposal shall be kept on file at the site for auditing purposes.	NEMA Cradle to Grave	Throughout operations

	Construction Operation Decommissioning Rehabilitation and Closure	Waste has the potential to pollute the environment and can vary from localised to large scale impacts	The small-scale mine will adopt a cradle-to-grave approach to ensure that the waste is removed and disposed of in the prescribed and correct manner.	NEMA Cradle to Grave	Throughout operations

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Sewage and Sanitation					
General Construction Mining Permit area site preparation General opencast management Opencast mining Maintenance and operation of site infrastructure and facilities General decommissioning activities Infrastructure removal	Construction Operation Decommissioning Rehabilitation and Closure	Sewage has the potential to result in localised impacts of low to medium significance	There must be adequate provision for safe and effective sanitation (i.e. ablution facilities) at the mine and work sites and these shall conform to all relevant health and safety standards and codes. The Mine shall ensure compliance with the OHSA and MHSA in terms of sewage and sanitation. Under no circumstances will pit latrines, french drain systems or soak away systems be allowed. Portable toilets will be managed by reputable contractors and inspected daily for any potential leaks. The Contractor (or reputable toilet-servicing company) shall be responsible for the cleaning, maintenance and servicing of the toilets. Chemical toilets shall be emptied/serviced frequently to avoid offensive odours (at least weekly). Toilets must be kept in a clean, neat and hygienic condition. Chemical toilets shall be cleaned and emptied before the contractor's long weekends or	NEMWA NWA NEMA Cradle to Grave	Throughout operations

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			public holidays. Toilets must be easily accessible. Toilets shall be placed outside areas susceptible to potential flooding and shall not be placed within 100 m of any wetland or watercourse. Ablution facilities shall be located a sufficient distance from any offices or eating areas to prevent nuisance from offensive odours. Disposal of sewage from chemical toilets shall be in a safe and responsible manner and at an approved facility specifically for that purpose. Proof of sewage removal and disposal shall be kept on file for auditing purposes.		
Noise					

General decommissioning activities General surface rehabilitation	Construction Operation Decommissioning Rehabilitation and Closure	Noise has the potential to result in significant impacts to sensitive receptors at a small to medium scale	The small-scale mine shall take reasonable measures to limit exceedingly noisy activities. Where noise is generated which may impact on sensitive receptors, the mine shall apply measures to control the noise cannot be avoided, mitigation measures	SANS10103 ECA Noise Regulations World Bank EHS Guidelines OHSA MHSA	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Mineral Processing Opencast mining Filling opencast voids Re-vegetation Site establishment – contractors camp			to be applied shall include but is not limited to: • Using the smallest/quietest equipment for the particular purpose. • Ensuring that equipment is well- maintained and fitted with the correct and appropriate noise abatement measures. • Where possible, stationary noisy equipment (for example compressors, pumps, pneumatic breakers,) should be encapsulated in acoustic covers, screens or sheds. Proper sound insulation can reduce noise by up to 20 dBA. All construction vehicles and equipment are to be kept in good repair. • Machines in intermittent use should be shut down in the intervening periods between work or throttled down to a minimum. • The contractor must attempt to restrict noisy activities as far as is possible to times and locations		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			whereby the potential for noise nuisance is reduced. • When working near (within 800 meters) to a potential sensitive receptor(s), the Contractor shall limit the number of simultaneous activities to the minimum. • All machines should be equipped with appropriate noise reduction equipment. • All machines should be roadworthy (including meeting maximum noise specifications). • The vehicles exhaust and baffle systems must be maintained regularly to ensure that the noise from these vehicles is within the required noise specification. • All plant and equipment must be operated in accordance with the specifications provided by the manufacturer. • Safety measures that generate noise, including reverse gear alarms, should be adjusted to		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			minimise noise where possible. A maintenance programme will be investigated for the ventilation machinery and shall be implemented should feasible options exist. Community involvement needs to continue throughout the project. Good public relations are essential. At all stages surrounding receptors should be educated with respect to the potential increase of noise from the mine. The information presented to stakeholders should be factual and should not set unrealistic expectations.		

			Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Quieter equipment will be sought where possible when purchasing new equipment. Silencers will be utilised where possible. Point sources will be enclosed where possible. Acoustic screens will be considered if I&AP complaints are received.		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			Local residents should be notified of any potentially noisy activities or work and these activities should be undertaken at reasonable times of the day. These works should not take place at night or on weekends.	SANS10103 ECA Noise Regulations World Bank EHS Guidelines OHSA MHSA	Throughout
			A channel of communication should be established and promoted between the mine and surrounding stakeholders. All noise complaints must be recorded and investigated. If required, the complaints should be investigated by an acoustical consultant.		

			As a general rule, construction operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993). The Applicant and Contractor(s) shall obtain a copy of the relevant noise regulations and take all reasonable measures to abide by these regulations. Sound pressure levels should not exceed the specified threshold level for the relevant area in accordance with SANS10103, as experienced by the nearest noise		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			sensitive receivers (i.e. local residents). In the event that noise levels exceed the specified thresholds in terms of the noise regulations, the Applicant shall appoint a suitably qualified acoustic engineer to identify sources of the elevated noise levels and to suggest suitable and reasonable mitigation measures.		
Air Quality					
General decommissioning activities General surface rehabilitation	Construction Operation Decommissioning Rehabilitation and Closure	Localised and low significance	Areas of high risk for spontaneous combustion will be inspected regularly for signs of possible combustion. An emergency procedure will be set up in the case of spontaneous combustion.	NEMAQA Dust Regulations	Throughout

Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation	Construction Operation Decommissioning Rehabilitation and Closure	Wide scale of disturbance and low to medium significance. Some localised high significant impacts	It is important to note that dust could be a major disturbance, especially during the dry winter periods to people residing around the site. All reasonable measures must be utilised to minimise the generation of dust as a result of activities on site. Such measures shall include, but shall not be limited to: • Traffic control measures aimed at reducing the entrainment of	NEMAQA Dust Regulations	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Opencast mining Post closure monitoring and maintenance Re-vegetation			material by restricting traffic volumes and reducing vehicle speeds. • Regular and effective measures aimed at binding the surface material or enhancing moisture retention, such as wet suppression and chemical stabilization. • Application of chemical dust palliatives and the optimal selection of wearing course materials (where possible environmentally friendly products should be utilised). • Appropriate scheduling of dust-generating activities (e.g. the clearing of parking areas should be postponed until the construction programme requires the clearing of that specific area). • Avoid excavation and stockpiling activities during periods of strong winds. • Increase dust suppression efforts during conditions conducive to excessive dust creation (e.g. dry and windy conditions).		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• Limit the height of soil stockpiles where possible, and wetting down of soil stockpiles when excessive dust is generated from these stockpiles. • Areas where excessive or difficult to manage fallout dust and erosion occur remain may be treated with chemical dust suppressant or paved as opposed to using water.		
	Construction Operation Decommissioning Rehabilitation and Closure	Wide scale of disturbance and low to medium significance. Some localised high significant impacts	The small-scale mine shall comply with the National Dust Control Regulations, Promulgated under the National Environmental Management: Air Quality Act (Act 39 of 2008). In the event that dust levels exceed the specified thresholds in terms of the dust control regulations, the Mining Permit holder shall appoint a suitably qualified specialist to identify sources of the excessive dust levels and to suggest suitable and reasonable mitigation measures.	NEMAQA Dust Regulations	Throughout
	Construction	Localised and low	The small-scale mine must ensure that	NEMAQA Dust	Throughout

	Operation	significance	no transported materials escape from	Regulations	

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Decommissioning		the construction and mine vehicles (no spillage on roads or dust clouds). If necessary, the load bin of the vehicle shall be covered with a tarpaulin to prevent dust.		
	Construction Operation Decommissioning Rehabilitation and Closure	No direct Impacts	The small-scale mine shall maintain open and transparent communication with the community and surrounding landowners regarding air quality and shall supply monitoring records to the public upon request.	NEMAQA Dust Regulations	Throughout
	Constructio n Operation	Localised and low significance	A skirt (dust barrier) shall be placed around the base of dry drills to minimise the generation of airborne dust.	NEMAQA Dust Regulations	Throughout
	Construction Operation Decommissioning Rehabilitation and Closure	Health impacts have a localised but high significance	Employees will receive training on the use of personal dust respirators, whenever high dust levels are experienced.	NEMAQA Dust Regulations	Throughout

	Construction Operation Decommissioning Rehabilitation and Closure	Wide scale of disturbance and low to medium significance. Some localised high significant impacts	Speed limits will be established and enforced on the mine to minimise dust generation.	NEMAQA Dust Regulations	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Construction Operation Decommissioning Rehabilitation and Closure	Localised and low significance	Machinery and equipment will be regularly serviced to ensure they are in proper working condition and to reduce risk of excessive emissions.	NEMAQA Dust Regulations	Throughout
Heritage					
	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on heritage affect a limit extent but have a very high significance due to the value of heritage resources which are protected by law	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity.	NHRA	Throughout

	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on heritage affect a limit extent but have a very high significance due to the value of heritage resources which are protected by law	Should graves be observed on site during activity progress then all activity should cease and the area demarcated as a no-go zone. A specialist will need to be consulted and responsible action considered, whether grave relocation or ceasing activity completely within the area and a 100 m buffer zone.	NHRA	Throughout
	Construction Operation	Impacts on heritage affect a	The small-scale mine must develop a heritage management plan. This should	NHRA	As soon as possible and

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Decommissioning Rehabilitation and Closure	limit extent but have a very high significance due to the value of heritage resources which are protected by law	include the relevant measures to protect and monitor all known heritage resources on site. Furthermore, the plan should include a chance finds procedure.		implemented throughout

	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on heritage affect a limit extent but have a very high significance due to the value of heritage resources which are protected by law.	All identified gravesites will be fenced off, or relocated. Access to gravesites will be arranged for family members/friends of the deceased if requested. Grave sites that remain in-situ shall be inspected on a regular basis as per the heritage management plan to ensure no damage has occurred.	NHRA	As soon as possible and implemented throughout
	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on heritage affect a limit extent but have a very high significance due to the value of heritage resources which are protected by law.	In the event that graves or cemeteries must be relocated, a full grave relocation process must be undertaken that includes comprehensive social consultation. The grave relocation process must include: • A detailed social consultation process, that will trace the next-of- kin and obtain their consent for the	NHRA Human Tissue Act	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			relocation of the graves, which will be at least 60 days in length. • Site notices indicating the intent of the relocation. • Newspaper notice indicating the intent of the relocation. • A permit from the local authority. • A permit from the Provincial Department of Health. • A permit from the South African Heritage Resources Agency, if the graves are older than 60 years, or unidentified and thus presumed older than 60 years. • An exhumation process that keeps the dignity of the remains and family intact. The whole process must be done by a reputable company that is well versed in relocations. • The exhumation process must be conducted in such a manner as to safeguard the legal rights of the families as well as that of the development company.		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Land Capability					
General surface rehabilitation Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Filling opencast voids	Construction Operation Decommissioning	Impacts on land capability have long term effects and can be of a high significance	The small-scale mine will ensure that overburden stockpiles are located in accordance with the rehabilitation plan to allow for minimal handling when returning soils during rehabilitation.	In accordance with Rehabilitation and Closure Plan	Throughout
	Construction Operation Decommissioning Rehabilitation and Closure		The small-scale mine shall preserve soil potential as far as possible, thus conserving land capability.	In accordance with Rehabilitation and Closure Plan	Throughout
	Construction Operation Decommissioning Rehabilitation		Soil stockpiles should be vegetated with prescribed seed mixtures to prevent soil erosion.	In accordance with Rehabilitation and Closure Plan	Throughout
	Rehabilitation		During rehabilitation care must be taken to return the correct soil types and depths to specific sections of rehabilitated land to ensure land capability potential is restored to that area.	In accordance with Rehabilitation and Closure Plan	During Rehabilitatio n

	Construction Operation Decommissioning Rehabilitation and Closure		Re-vegetate rehabilitated areas as soon as possible to prevent soil erosion.	In accordance with Rehabilitation and Closure Plan	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Surface Water					
Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Re-vegetation Site establishment	Construction Operation Decommissioning	Impacts on surface water can have a high significance and extent	Where clean water is diverted away from construction and/or mining areas, its point of re-entry into the natural watercourse should be well protected against erosion. In addition, sediments should be effectively trapped before re- entry.	NWA GN 704 DWAF best Practise Guidelines Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	As soon as possible and implemented throughout
	Construction Operation Decommissioning		No wastewater may run freely into any of the surrounding environment or neighbouring properties. The contractor shall implement the storm water design in accordance with the approved Storm Water Management Plan. The Applicant and Contractor(s) shall ensure compliance with the requirements of the National Water Act and GN 704		

	Construction Operation Decommissioning Rehabilitation and Closure		All areas susceptible to erosion shall be protected by ensuring that there is no undue soil erosion resultant from construction and/or mining activities. Berms shall be constructed where necessary to direct all runoff into the stormwater system. Care must be taken		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			to avoid scouring and erosion and suitable measures should be placed in areas where runoff concentrates, in order to detain the sediment load and slow down the runoff. All erosion damage shall be repaired as soon as possible as directed by the ECO.		
	Construction Operation Decommissioning Rehabilitation and Closure		All storm water and erosion control mechanisms must be inspected frequently and shall be maintained on a regular basis to ensure they remain effective. Appropriate remedial action, including the rehabilitation of eroded areas, shall be undertaken under direction from the ECO.		
	Construction		Materials capable of resulting in poor quality leachate will not be used for the construction of haul roads. This will entail testing for acid generation potential.		

	Construction		Where possible, the disturbance of land during the construction phase will be confined to areas which are disturbed for the operation of the mine.		
	Construction Operation		Soil stockpiles must be stabilised with vegetation to reduce erosion and		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			siltation into streams and dams.		
	Construction Operation Decommissioning Rehabilitation and Closure		Hydrocarbon spills will require immediate attention and should be disposed of at a reputable facility. All used hydrocarbons will be collected and recycled.		
	Construction Operation Decommissioning Rehabilitation and Closure		All licenses and permits required as per the National Water Act will be applied for as per the relevant water uses and mining will adhere to regulations stipulated in the water license.		
	Construction Operation Decommissioning Rehabilitation and Closure		The small-scale mine shall ensure soil erosion control measures are established in all high risk areas to reduce silt-loading in storm water runoff. Construct a down-stream drain and silt traps at the outlet of water diversion areas. Clean out silt build up in trenches and silt traps over dry season or more frequently if needed.		

			Conduct construction activities in the dry winter months as far as possible.		
	Construction Operation		Storm water runoff will be diverted around the opencast pit on the upslope side but the area enclosed within these		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			boundaries will be kept as small as possible.		
	Construction Operation		The small-scale mine shall ensure that water management facilities are operating adequately and will remain operational during a 50 year 24 hr. storm event until such time that all disturbed areas are stabilized.		
	Rehabilitation and Closure		On gentle slopes, water will be encouraged to flow off the rehabilitated surface, as surface flow, as quickly as possible without causing erosion. This will ensure that water does not infiltrate too deeply and come into contact with carbonaceous material. On steeper slopes, water will be encouraged to infiltrate slightly to help prevent soil erosion.		
Wetlands					
Maintenance and operation of site infrastructure and facilities	Construction	Impacts on wetlands are considered to be highly significant due to the sensitivity of these	The small-scale mine shall limit the extent of the development footprint to exclude aquatic resources as far as possible.	NWA GN 704 Shall adhere to the ESMS Framework guided by Equator Principles, and	Throughout
	Construction		The small-scale mine shall take the		Throughout

Opencast mining	Operation		necessary precautions to avoid any	IFC Performance	

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Site establishment	Decommissioning Rehabilitation and Closure	areas. Impacts can range from localised to impacts which are large in extent	impacts to wetlands outside of the required construction and/or mining footprint. These areas should be considered as no-go areas, and the restriction should be enforced.	Standards	
	Construction Operation Decommissioning Rehabilitation and Closure		The small-scale mine shall set up a 100 m buffer zone around sensitive areas, including pans, wetlands and streams. These areas should be considered as no-go areas, and the restriction should be enforced.		Throughout
	Construction Operation Decommissioning Rehabilitation and Closure		Any wetlands impacted during the construction or mining process on site should be rehabilitated in accordance with the principles and guidelines presented in this EMPR.		Throughout
	Construction Operation Decommissioning Rehabilitation and Closure		Re-vegetate all bare wetland areas not directly within the footprint of the developments as soon as possible. The extent of the disturbance should be limited to a minimum.		Throughout

	Rehabilitation and Closure		Regular monitoring of the success of wetland rehabilitation measures must be undertaken. Where required, the necessary adjustments should be made to ensure the complete re-		Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			establishment of the natural vegetation.		
	Constructio n Operation		Construction of a low berm, approximately 1m high by 2-3m wide between the stockpiles and the wetlands. These berms would serve to intercept flows containing suspended sediments and create a depositional environment. They should be located outside the wetland boundaries and should be created prior to construction and vegetation clearing on the stockpile footprint commencing.		Throughout
	Construction Operation Decommissioning Rehabilitation and Closure		Inform all construction contractors and other personnel to not disturb the fauna and flora in wetland areas and not to wash or bath in local streams.		Throughout
	Construction Operation Decommissioning Rehabilitation and		Control dust emissions to prevent dust from settling in the wetland areas.		Throughout

	Closure				
	Construction Operation Decommissioning Rehabilitation and		The small-scale mine shall implement an aquatic bio-monitoring and water quality programme. Where target endpoints are not met,		Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Closure		recommendations should translate directly into follow-up action that is recorded and auditable.		
	Construction Operation Decommissioning Rehabilitation and Closure		No dirty water may be discharged into any wetland or water resource on site unless treated to the required standards.		Throughout

	Construction Operation Decommissioning Rehabilitation and Closure Construction Operation		No stockpiling of material may take place within the wetland areas and temporary construction camps and infrastructure should also be located away from these areas, with a minimum buffer of 100 m maintained from delineated wetland boundaries. In cases where historical mining activities have encroached within 100 m of wetlands, exemption must be obtained for the provisions of GN 704 and the necessary protection measures shall be implemented to minimise the impact on wetlands as far as is possible. No abstraction of water from the wetlands or dams should be allowed		Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
	Decommissioning Rehabilitation and Closure		unless expressly authorised in the Water Use License.		
	Construction Operation Decommissioning Rehabilitation and Closure		Where storm water and/or diverted clean water is discharged into wetlands, appropriate measures such as gabions should be constructed to contain erosion.		Throughout
Topography and Landform					
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on topography tend to be large in extent and can have a significant effect on the environment	Levelling out of the mine site area will be supervised by a qualified engineer in conjunction with an environmental consultant. Where possible, natural drainage lines will be followed to reduce loss of water in the natural catchments. A post mining topographical plan should be developed during the start of the project in order to ensure compliance during and after mining. This plan must be adhered to at all	In accordance with Rehabilitation and Closure Plan Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

Opencast mining Post closure monitoring and maintenance			stages of the project. Overburden will be temporarily stockpiled and will be placed back into the pit once the Coal has been		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Site establishment			mined out, therefore attempting to maintain the natural topography.		
			The overburden should be replaced in a manner that replicates the previous topography, and ensures that the final topography has a surface that is free-draining.		
			There will be checks to ensure that the planned post mining topography is being followed.		
			All heavy machinery operators and truck drivers should be instructed to stay in designated areas, such as operation sites and roads.		
			Soils should be stockpiled separately according to their forms and their potentials.		
			During ongoing rehabilitation, soil horizons should be replaced in the same order as they occur in nature to prevent mixing of soil horizons.		

			Topsoil depth should be related to the proposed post-mining land capability plans.		
			Rehabilitated areas should not be compacted more than is necessary,		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			and activity, particularly that of heavy machinery and vehicles, on these areas should be limited.		
			Rehabilitated areas should be landscaped to prevent water logging and vegetated to prevent soil erosion.		
			Erosion control measures such as contour banks and cut off berms should be constructed and soil vegetated in rehabilitated areas.		
			Accidental hydrocarbon spillages should have sawdust applied immediately, and rehabilitated or if this is not possible then the affected soil should be removed and the area rehabilitated.		
			Final profiling of the last cut will take place to ensure the area is rehabilitated as close to its natural state as possible.		
			Additional debris and soil will be brought in if required.		

			The area where pans once were will require additional attention to help restore its functions and form.		
			Regular surveyance to ensure the rehabilitation conforms to the final		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			topographical plan and that no final void will be left.		
Transportation, Infrastructure and Traffic					
Mining Permit area site preparation Opencast mining Site establishment – Contractors Camp Site establishment Water management Infrastructure construction	Construction Operation Decommissioning Rehabilitation and Closure	Impacts on transportation infrastructure and traffic can have a significant extent although typically low in significance	The small-scale mine shall ensure that the internal haul roads are adequately maintained, including monthly scraping where required. Together with road maintenance, the storm water system to direct storm water that falls within the roads shall be kept maintained and settlement ponds shall be cleared of silt on a regular basis.	Road Traffic Act OHSA MHSA	Throughout
			On-site vehicles must be limited to approved access routes and areas (including turning circles and parking) on the site so as to minimise excessive environmental disturbance to the soil and vegetation on site, and to minimise disruption of traffic.		

			In the case of dual or multiple use of access roads by other users, arrangements for multiple responsibility must be made with the other users. If not, the maintenance of access roads will be the responsibility of the Applicant		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			and/or Contractor(s). Road condition must be assessed regularly for signs of damage.		
			Damage caused to public roads as a result of the construction and/or mining activities shall be repaired in consultation with the relevant municipal authorities.		
			Materials for the haul road will be sourced locally from a legal source and the Department of Roads and Transport will be consulted with regard to the construction of haul roads.		
			All intersections with main tarred roads will be clearly signposted.		
			Road signs and safety features such as rumble strips will be maintained to ensure the writing is legible and the haul road crossings are visible to motorists.		

			All construction and mining vehicles using public roads shall be in a roadworthy condition and their loads secured. They must adhere to the speed limits and all local, provincial and national regulations with regards to		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			road safety and transport.		
Visual					
General surface rehabilitation Mining Permit area site preparation Opencast mining Site establishment	Rehabilitation and Closure	Visual impacts have an impact on the perception and sense of place in the area and although hard to quantify can have a significant impact over a large extent of the area	Final shaping will be implemented, such that, the final profile of the rehabilitated mining areas are formed to emulate natural contours of the area.	In accordance with Rehabilitation and Closure Plan Closure and final land use objectives	Throughout
	Construction Operation Decommissioning		Directional lighting and soft lighting will be utilised to ensure that only areas required to be lit are lit. Screens will be considered if I&AP complaints are received.		
	Construction Operation Decommissioning		Where possible, and in consideration of the rehabilitation plan and objectives, the mine shall create screening using soil stockpiles, berms and natural vegetation to reduce the visual impact of the mining operations and infrastructure.		
	Construction Operation Decommissioning Rehabilitation and Closure		Dust suppression methods must be applied when necessary to restrict the visual impact of dust emissions.		

Blasting and Vibration					
Open cast mining	Operation	Blasting and	Prior to mining commencing, local	MHSA	Throughout

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
		Vibration can have a significant impact which increases in significance with proximity to the blast	infrastructure should be inspected to determine and document the extent of existing damage. These properties will be periodically evaluated to determine any damage. Records of blasting times and distance to properties will also be used to determine likelihood of damage. The reduction of ground vibration is fundamental in different ways and shall include the following measures: • Detailed blast design for each blast with consideration the effects from blasting i.e. ground vibration and air blast. • Calculate expected ground vibration levels for blast to be done and if necessary re-design to reduce charge mass per delay, use of electronic initiation of blast, drilling smaller diameter blastholes that will reduce charge per blasthole and per delay. The reduction of air blast is fundamental in different ways and shall	Explosives Act No. 26 of 1956 and amended No. 15 of 2003 United States Bureau of Mines (USBM) criteria for safe blasting for ground vibration	Operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			include the following measures: • Detailed blast design for each blast with consideration the effects from blasting i.e. ground vibration and air blast. • Use of proper stemming lengths of between 25 and 30 blasthole diameters. • Use of crushed aggregate of 10% the blasthole diameter as stemming material • Record stemming lengths for each blast and correct if necessary prior to every blast blasted. • Monitor each blast done.		
			The small-scale mine should liaise with local residents on how best to minimise the impact of blasting. Information that should be provided to the potential sensitive receptor(s) includes: • Proposed blasting schedules. • How long the activity is anticipated to take place. • What is being done, or why the		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			activity is taking place. • Contact details of a responsible person where any complaints can be lodged should there be an issue of concern.		
Groundwater					
General decommissioning activities General surface rehabilitation	Construction Operation Decommissioning Rehabilitation and Closure	The mining impact on groundwater potentially affected a very large area and has a potentially high significance impact	The small-scale mine must take all reasonable measures to avoid and limit pollution of ground water resources as a result of site activities. Pollution could result from the release, accidental or otherwise, of chemicals, oils, fuels, sewage, waste water containing organic waste, detergents, solid waste and litter etc. The Mining Permit holder and Contractor(s) shall comply with the requirements relating to hazardous materials and spill management presented in this EMPR.	NEMA Duty of care NWA GN 704 DWAF best practice guidelines Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	Throughout

Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation	Construction Operation Decommissioning Rehabilitation and Closure		In the event of pollution caused as a result of construction or mining activities, the responsible party, according to Section 20 of the National Water Act (Act No. 36 of 1998) shall be responsible for all costs incurred by		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Re-vegetation Site establishment			organisations called to assist in pollution control and/or to clean up polluted areas.		
	Constructio n Operation		Materials capable of resulting in poor quality leachate will not be used for the construction of haul roads.		
	Operation		Water accumulating within the opencast workings will be pumped and it will be re-used in the operation.		
	Construction Operation Decommissioning Rehabilitation and Closure		The small-scale mine shall ensure that the ground water monitoring programme is implemented.		
	Operation Decommissioning Rehabilitation and Closure		The rehabilitation of mined cuts need to be done to minimise infiltration and then need to mine water. To achieve this, the area must be free draining in its entirety, the soil cover needs to be replaced and sufficient vegetation cover needs to be established.		

	Operation Decommissioning Rehabilitation and Closure		Water decanting from the opencast workings where the floor cannot be flooded will be collected and treated prior to release, unless monitoring indicates that the water quality meets the water management objectives.		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Decommissioning					
General decommissioning activities General opencast management Filling opencast voids	Decommissioning	Decommissioning of infrastructure can result in negative impacts. The extent is localised to the extent of the infrastructure and mining footprint.	All infrastructure, equipment, plant, temporary housing and other items used during the mining period will be removed from the site (section 44 of the MPRDA). Infrastructure should be removed down to foundations to prevent loss of soil productivity. All vehicles, equipment and other assets belonging to the Mining Permit holder/Contractor(s) must be removed from the property upon completion of the mining operation, including any excess aggregate, gravel, stone, concrete, temporary fencing and the like.	MPRDA In accordance with Rehabilitation and Closure Plan Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	During decommissioning activities

			No discard materials of whatsoever nature shall be buried on the site, or on any vacant or open land in the area. Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the Mining Permit area and disposed of at a recognised landfill facility. It will not be		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			permitted to be buried or burned on the site.		
Rehabilitation					
General surface rehabilitation Re-vegetation	Rehabilitation and Closure	Rehabilitation has limited negative impacts. The scale of the impact is limited to the disturbance footprint.	An Integrated Rehabilitation and Closure Plan shall be developed by the small-scale mine early in the life of the operations (preferably prior to operation). The Plan must be viewed as a dynamic document and shall be subjected to independent review on an annual basis (together with the quantum for financial provision). As a minimum the Integrated Rehabilitation and Closure Plan shall include the following;	MPRDA In accordance with Rehabilitation and Closure Plan Shall adhere to the ESMS Framework guided by Equator Principles, and IFC Performance Standards	As soon as possible in operational phase and implemented throughout Annually updated

			• Desired end land use objectives. • Methodology and proposed schedule for progressive rehabilitation to be undertaken concurrently with mining operations. • Details of soil preparation procedures including proposed measures to improve soil fertility (if		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			so required) and the sustainability thereof. • A list of the plant species that will be used in the rehabilitation process. Only indigenous species may be utilised and these species should be representative of the relevant vegetation unit/landscape type of the area. • Procedures for ensuring vegetation growth and survival (watering, fertilisation etc.). • Details of proposed storm water and erosion control measures to ensure re-vegetation is successful and not hampered by scouring and erosion. • Monitoring procedures that will be implemented to assess re-vegetation efforts (duration and frequency of monitoring, criteria for determining success of rehabilitation). • Procedures for preventing the establishment of alien invasive		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			vegetation in rehabilitated areas. Upon completion of the mining operation and closure of the facility, the Mining Permit holder shall ensure that all cleared and/or disturbed areas (as a result of the activity) within and outside the boundaries of the site shall be rehabilitated in accordance with the Rehabilitation and Closure Plan. Rehabilitation will include returning the slope to the minimum possible gradient (preferably less than 1:3), the topsoil will be replaced for vegetation re- establishment and contour drains will be built to prevent erosion if necessary.		

			The area must be rehabilitated using indigenous vegetation from the area in such a way that it will return as close as possible to the original production potential. Rehabilitation shall be overseen by a suitably qualified specialist who shall approve the indigenous seed mix to be used. The rehabilitated area must be returned to a self-sustaining ecosystem that is consistent with the original vegetation type.		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			Any access road or portions thereof, constructed by the mine which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the ECO and Regional Manager (DMRE).		
			Erosion control measures shall be implemented where necessary (such as berms, brush packing, silt fences etc.). Erosion control and silt prevention measures shall be inspected regularly and shall be maintained whenever required to ensure they remain effective.		
			No alien or invader plant species should be introduced on site during rehabilitation. The weed management plan shall be implemented throughout the rehabilitation and closure phase. Regular monitoring of the rehabilitated area shall be undertaken and all alien vegetation shall be eradicated and/or controlled prior to it setting seed. Weed		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			management shall be to satisfaction of the ECO and Regional Manager (DMRE). Where required, the necessary adjustments should be made to ensure the complete re-establishment of the natural vegetation.		
Closure					
Post closure monitoring and maintenance	Rehabilitation and Closure	Very limited potential for impacts during closure. The Mine remains responsible for the mining right area until such time as a closure certificate is obtained.	Following the expiration of the Mining Permit, the Mining Permit holder shall undertake the required closure process in accordance with Section 43 of the MPRDA.	MPRDA and Regulations	In accordance with legislated timeframes in force at the time of closure.
Post-Closure Monitoring					

Post closure monitoring and maintenance	Rehabilitation and Closure	Very limited potential for impacts during closure. The Mine remains responsible for the	The post-closure monitoring and management period following cessation of mining activities will be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the	MPRDA and Regulations	Minimum of one (1) year post closure or as agreed upon with DMRE

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
		mining right area until such time as a closure certificate is obtained.	competent authority. The monitoring activities during this period will include but not be limited to: • Biodiversity monitoring. • Ground and surface water. • Air quality monitoring. • Re-vegetation of disturbed areas where required. Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed Mining Permit activities and incorporated into post closure monitoring & management.		

29 FINANCIAL PROVISION

The requirement for final rehabilitation, decommissioning and closure stems primarily from the legislative requirements of the MPRDA and NEMA. On 20th November 2015 the Minister promulgated the Financial Provisioning Regulations under the NEMA. The Regulations aim to regulate the determination of financial provision as contemplated in the NEMA for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. These regulations provide for, inter alia:

- Determination of financial provision: An Applicant or holder of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of prospecting, mining or production operations, as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources.
- Scope of the financial provision: Rehabilitation and remediation; decommissioning and closure activities at the end of operations; and remediation and management of latent or residual impacts.
- Regulation 6: Method for determining financial provision – An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:
    - Annual rehabilitation – annual rehabilitation plan.
    - Final rehabilitation, decommission and closure at end of life of operations – rehabilitation, decommissioning and closure plan.
    - Remediation of latent defects.
- Regulation 10: An applicant must-
    - ensure that a determination is made of the financial provision and the plans contemplated in regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for environmental authorisation, the associated environmental management programme and the associated right or permit in terms of the Mineral and Petroleum Resources Development Act, 2002.
    - Provide proof of payment or arrangements to provide the financial provision prior to commencing with any prospecting, mining or production operations.
- Regulation 11: Requires annual review, assessment and adjustment of the financial provision. The

review of the adequacy of the financial provision including the proof of payment must be independently audited (annually) and included in the audit of the EMPR as required by the EIA Regulations.

Appendix 4 of the Financial Provisioning Regulations provides the minimum content of a final rehabilitation, decommissioning and closure plan (FRDCP).

Table 30: Financial Provision

CALCULATION OF THE QUANTUM

Applicant: **Vernex Holdings (Pty) Ltd** REF No: **MP 30/5/1/3/2/13020 MP**
Evaluator: **Zwivhuya Tshabuse** Date: **Dec-22**

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	**Dismantling of processing plant and related structures (including overland conveyors and powerlines)**	**m3**	**0**	**17.14**	**1**	**1**	**0**
2 (A)	**Demolition of steel buildings and structures**	**m2**	**0**	**238.71**	**1**	**1**	**0**
2(B)	**Demolition of reinforced concrete buildings and structures**	**m2**	**0**	**351.79**	**1**	**1**	**0**
3	**Rehabilitation of access roads**	**m2**	**0**	**500**	**1**	**1**	**0**
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414.61	1	1	**0**
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	226.15	1	1	**0**
5	**Demolition of housing and/or administration facilities**	**m2**	**0**	**477.42**	**1**	**1**	**0**
6	**Opencast rehabilitation including final voids and ramps**	**ha**	**4.1**	**242984.15**	**0.5**	**1**	**498117.5075**
7	**Sealing of shafts adits and inclines**	**m3**	**0**	**128.15**	**1**	**1**	**0**
8 (A)	**Rehabilitation of overburden and spoils**	**ha**	**0.03**	**166847.44**	**1**	**1**	**5005.4232**
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.003	207805.47	1	0	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0.06	603565.59	1	1	**36213.9354**
9	Rehabilitation of subsided areas	ha	0	139709.6	1	1	**0**
10	**General surface rehabilitation**	**ha**	4.1	132171.31	0.5	1	**270951.1855**
11	River diversions	ha	0	132171.31	1	1	**0**
12	**Fencing**	**m**	**0**	**150.77**	**1**	**1**	**0**
13	**Water management**	**ha**	**0.06**	**50255.25**	**0.6**	**1**	**1809.189**
14	**2 to 3 years of maintenance and aftercare**	**ha**	**0**	**17589.34**	**1**	**1**	**0**
15 (A)	**Specialist study**	**Sum**	**0**	**0**	**1**	**1**	**0**
15 (B)	Specialist study	Sum	0	0	1	1	**0**
					Sub Total 1		**812097.2406**

1	Preliminary and General	97451.66887	**weighting factor 2** 1	**97451.66887**
2	Contingencies	81209.72406		**81209.72406**
			Subtotal 2	**990758.63**
			VAT (15%)	**148613.80**
			Grand Total	**1139372**

SIGN Zwivhuya Tshabuse
DATE 12/12/2022

29.1 Other Guidelines

The following additional guidelines which relate to financial provisioning and closure have been published in the South African context:

Best Practice Guideline G5: Water Management Aspects for Mine Closure: This guideline was prepared by the DWS and aims to provide a logical and clear process that can be applied by mines and the competent authorities to enable proper mine closure planning that meets the requirements of the relevant authorities. This guideline is aimed mining activities, however certain principles related to closure and water management are relevant. The following technical factors which should be considered during closure, and which are likely to relate to mining activities, have been considered:

- Land use plan: directly interlinked with water management issues insofar as water is required to support the intended land use- in this regard the surrounding communities and the land uses implemented rely on available ground and surface water to be sustained. Management of water quality and quantity has been identified as an aspect to be covered in the FRDCP.
- Public participation and consultation: consultation is fundamental to closure and there is a need for full involvement of stakeholders in the development of the final closure plans, and in the agreement of closure objectives- in this regard this FRDCP has been made available through the Basic Assessment public participation process for comment by relevant stakeholders.

• Guideline for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine: The objectives of the guideline include the need to improve the understanding of the financial and legal aspects pertaining to the costing of remediation measures as a result of mining activities. Whilst this guideline predates the recent NEMA Financial Provisioning Regulations, it does contain certain principles and concepts that remain valid and have been considered in the FRDCP.

30 DESCRIBE THE CLOSURE OBJECTIVES AND THE EXTENT TO WHICH THEY HAVE BEEN ALIGNED TO THE BASELINE ENVIRONMENT DESCRIBED UNDER THE REGULATION

The closure objectives are aimed at re-instating the landform, land use and vegetation units to the same as before mining operations take place unless a specific, reasonable alternative land use is requested by the landowner. As such, the intended end use for the disturbed Mining Permit area and the closure objectives will be defined in consultation with the relevant landowner. Proof of such consultation will be submitted together with the Application for Closure Certificate. The overall aim of the rehabilitation plan is to rehabilitate the environment to a condition as close as possible to that which existed prior to mining. This shall be achieved with a number of specific objectives

(a) Making the area safe, i.e. decommission mining activities to ensure that the environment is safe for people and animals. This entails refilling the excavations.

(b) Recreating a free draining landform. This entails earthworks infilling, reshaping, levelling, etc. to recreate as close as possible the original topography and to ensure a free draining landscape.

(c) Re-vegetation. This involves either reseeding or allowing natural succession depending on the area, climate etc.

(d) Storm water management and erosion control. Management of stormwater and prevention of erosion during rehabilitation (e.g. cut off drains, berms etc. and erosion control where required).

(e) Verification of rehabilitation success (entails monitoring of rehabilitation).

(f) Successful closure (obtain closure certificate).

31 CONFIRM SPECIFICALLY THAT THE ENVIRONMENTAL OBJECTIVES IN RELATION TO CLOSURE HAVE BEEN CONSULTED WITH LANDOWNER AND INTERESTED AND AFFECTED PARTIES

The Public Participation Process (PPP) is a requirement of several pieces of the South African legislation and aims to ensure that all relevant Interested and Affected Parties (I&APs) are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study.

The PPP which forms part of the Mining Permit application needs to be managed sensitively and according to best practises in order to ensure and promote:

- Compliance with national legislation.
- Establish and manage relationships with key stakeholder groups.
- Encourage involvement and participation in the environmental study and authorisation/approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

- Introduce the proposed project.
- Explain the environmental authorisations required.
- Explain the environmental studies already completed and yet to be undertaken (where applicable).
- Determine and record issues, concerns, suggestions and objections to the project.
- Provide opportunity for input and gathering of local knowledge.
- Establish and formalise lines of communication between the I&APs and the project team.

- Identify all significant issues for the project.
- Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximise and/or promote positive environmental impacts associated with the project.

Landowners and I&APs were consulted and provided an opportunity to comment on the draft Basic Assessment Report, EMPR including all decommissioning, closure and rehabilitation plans. Their comments have be included in this final BAR and EMPR for consideration by the DMRE as part of their decision-making.

32 REHABILITATION PLAN

32.1 Integrated Rehabilitation and Closure Plan

The main aim in developing this rehabilitation plan is to mitigate the impacts caused by the mining activities and to restore land back to a satisfactory standard. It is best practice to develop the rehabilitation plan as early as possible so as to ensure the optimal management of rehabilitation issues that may arise. It is important that the project's closure plan is defined and understood before starting the process and is complementary to the rehabilitation goals. Rehabilitation and closure objectives need to be tailored to the project and be aligned with the EMPR.

The overall rehabilitation objectives for this project are as follows:

Maintain and minimise impacts to the ecosystem within the study area.

- Re-establishment of the pre-developed land capability to allow for a suitable post-mining land use.
- Prevent soil, surface water and groundwater contamination.
- Comply with the relevant local and national regulatory requirements.
- Maintain and monitor the rehabilitated areas.

Successful rehabilitation must be sustainable, requires an understanding of the basic baseline environment and project management to ensure that the rehabilitation program is a success.

It is noted that an application for environmental authorisation must be submitted for closure in accordance with Listing Notice 1 Activity 22:

The decommissioning of any activity requiring –

(a) A closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) or

(b) A prospecting right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent

authority has in writing agreed that such reduction in throughput does not constitute closure.

32.2 Phase 1: Making Safe

The Mining activity will result in an open pit. The purpose of rehabilitation will be to ensure the site becomes safe for humans and animals. The open pit will be filled with overburden. The overburden will be loaded, trucked and placed into the pit, and the topography in the area adjacent to the pit shaped to ensure that a free draining topography results.

Once the pit has been backfilled, 300mm thick topsoil or soft overburden in place of soil will be spread on rehabilitated areas. Once placed, the "growth medium" should then be fertilised, ripped and revegetated. A small topsoil stockpile should be left for remedial work.

The following actions are required to meet the objectives of this phase:

- Remove all the facilities and equipment from the site.
- Inert waste with a salvage value to individuals such as scrap metal, building materials, etc. will be removed and disposed of at a proper facility.
- The company contracted to supply fuel will be requested to remove all fuel storage and reticulation facilities.
- Those sections of haul road where a lot of Coal spillage has occurred, will be picked up and the waste material taken back to the discard dump.
- Remove or control residual hazardous materials. Identify any potential toxic overburden or exposed strata and manage them so as to prevent environmental damage.
- Access roads around the site should be ripped for all areas except those needed to access the facilities for inspection after closure. Roads that can and will be used by other users post closure should, however, be left provided this is agreed upon by all parties concerned. For the rehabilitation of roads, a cost has been allocated to rip the area, add 300 mm topsoil and vegetate.
- Negotiations will take place with land owners to establish which sections of haul road they will require. The extra portions not required will be left and the remainder ripped. This would normally mean that the edges or verges are ripped and the centre portion remains. They will be responsible for maintaining the roads after closure.

32.3 Phase 2: Landform Design, Erosion Control and Revegetation

Landform, erosion control and re-vegetation are important parts of the rehabilitation process. Landform and land use are closely interrelated, and the landform should be returned as closely as possible to the original landform. Community expectations, compatibility with local land use practices and regional infrastructure, or

the need to replace natural ecosystems and faunal habitats all support returning the land as closely as possible to its original appearance and productive capacity.

This requires the following:

- Deep rip compacted surfaces to encourage infiltration, allow plant root growth and key the topsoil to the subsoil, unless subsurface conditions dictate otherwise.
- Reinstate natural drainage patterns disrupted by mining wherever possible.
- Characterise the topsoil and retain it for use in rehabilitation. It is preferable to reuse the topsoil immediately rather than storing it in stockpiles. Only discard if it is physically or chemically undesirable, or if it contains high levels of weed seeds or plant pathogens.
- If topsoil is unsuitable or absent, identify and test alternatives substrates, e.g. overburden that may a suitable substitute after addition of soil improving substances.
- Lime and superphosphate are applied to the surface.
- These ameliorants are then incorporated by deep ripping, which penetrated 100 mm through the soil into the underlying overburden material.
- Fertilizer is applied as part of seedbed preparation.
- Consider spreading the cleared vegetation on disturbed areas.
- Re-vegetate the area with plant species consistent with the post mining land use.
- The site is then mulched together with an indigenous grass seed mix. This is to stimulate the long term establishment of indigenous vegetation and to reduce erosion during early plant growth.

32.4 Phase 3: Monitoring and Maintenance

The post-operational monitoring and management period following decommissioning of mining activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the Competent Authority.

Maintenance will specifically focus on annual fertilising the rehabilitated area (where required), control of all other alien plants and general maintenance, including rehabilitation of cracks, subsidence and erosion gullies. Continuous erosion monitoring of rehabilitated areas and slopes should be undertaken and zones with excessive erosion should be identified. The cause of the erosion should be identified, and rectified. Zones with erosion will need to be repaired with topsoil.

The monitoring activities during this period will include but not be limited to:

- Biodiversity monitoring.
- Re-vegetation of disturbed areas where required.

Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed mining activities and incorporated into post closure monitoring and management. The small-scale mine shall continue to monitor and manage rehabilitation areas until the vegetation is self-sustaining and meets the requirements of the landowner or land manager, until their management can be integrated into the management of the surrounding area.

32.5 Post-Closure Monitoring and Maintenance

Prior to decommissioning and rehabilitation activities, a monitoring programme shall be developed and submitted to the relevant authority for approval, as a part of the Final Rehabilitation Plan. The programme is to include proposed monitoring during and after the closure of the trench site and related activities.

It is recommended that the post-closure monitoring include the following:

- Confirmation that any waste, wastewater or other pollutants that is generated as a result of decommissioning will be managed appropriately, as per the detailed requirements set out in the Final Rehabilitation Plan.
- Confirmation that all de-contaminated sites are free of residual pollution after decommissioning.
- Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established. 'Acceptable cover' means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants.
- Confirmation that the Mining Permit site is safe and is not resulting in a pollution hazard.

Annual environmental reports will be submitted to the Designated Authority and other relevant Departments for at least one year post-decommissioning. The frequency and duration of this reporting period may be increased to include longer term monitoring, at intervals to be agreed with the Designated Authority.

The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed and free condition.

33 EXPLAIN WHY IT CAN BE CONFIRMED THAT THE REHABILITATION PLAN IS COMPATIBLE WITH THE CLOSURE OBJECTIVES

The rehabilitation plan is compatible with the closure objectives in that is seeks to ensure that negative impacts on the receiving environment that could not be prevented or mitigated during mining are rehabilitated. The use of indigenous species during re-vegetation will ensure that ecosystem restoration is initiated and prevent

invasion by alien species. The appropriate disposal of waste will ensure that land is usable, in alignment with surrounding land uses and that no hazardous materials are left on-site post-mining.

34 CALCULATE AND STATE THE QUANTUM OF THE FINANCIAL PROVISION REQUIRED TO MANAGE AND REHABILITATE THE ENVIRONMENT IN ACCORDANCE WITH THE APPLICABLE GUIDELINE

Table 30 details the quantum for financial provision for the Final Rehabilitation, Decommissioning and Closure Plan.

35 CONFIRM THAT THE FINANCIAL PROVISION WILL BE PROVIDED AS DETERMINED

The amount R 1 139 372.00 will be provided from the operating expenditure.

CALCULATION OF THE QUANTUM

MP 30/5/1/3/2/13020 MP

Applicant: **Vernex Holdings (Pty) Ltd** REF No:
Evaluator: **Zwivhuya Tshabuse** Date: **Dec-22**

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	**Dismantling of processing plant and related structures (including overland conveyors and powerlines)**	**m3**	**0**	**17.14**	**1**	**1**	**0**
2 (A)	**Demolition of steel buildings and structures**	**m2**	**0**	**238.71**	**1**	**1**	**0**
2(B)	**Demolition of reinforced concrete buildings and structures**	**m2**	**0**	**351.79**	**1**	**1**	**0**
3	**Rehabilitation of access roads**	**m2**	**0**	**500**	**1**	**1**	**0**
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414.61	1	1	**0**
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	226.15	1	1	**0**
5	**Demolition of housing and/or administration facilities**	**m2**	**0**	**477.42**	**1**	**1**	**0**
6	**Opencast rehabilitation including final voids and ramps**	**ha**	**4.1**	**242984.15**	**0.5**	**1**	**498117.5075**
7	**Sealing of shafts adits and inclines**	**m3**	**0**	**128.15**	**1**	**1**	**0**
8 (A)	**Rehabilitation of overburden and spoils**	**ha**	**0.03**	**166847.44**	**1**	**1**	**5005.4232**
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.003	207805.47	1	0	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0.06	603565.59	1	1	**36213.9354**
9	Rehabilitation of subsided areas	ha	0	139709.6	1	1	**0**
10	**General surface rehabilitation**	**ha**	4.1	132171.31	0.5	1	**270951.1855**
11	River diversions	ha	0	132171.31	1	1	**0**
12	**Fencing**	**m**	**0**	**150.77**	**1**	**1**	**0**
13	**Water management**	**ha**	**0.06**	**50255.25**	**0.6**	**1**	**1809.189**
14	**2 to 3 years of maintenance and aftercare**	**ha**	**0**	**17589.34**	**1**	**1**	**0**
15 (A)	**Specialist study**	**Sum**	**0**	**0**	**1**	**1**	**0**
15 (B)	Specialist study	Sum	0	0	1	1	**0**
						Sub Total 1	**812097.2406**

1	Preliminary and General	97451.66887	**weighting factor 2** 1	**97451.66887**
2	Contingencies	81209.72406		**81209.72406**
			Subtotal 2	**990758.63**
			VAT (15%)	**148613.80**
			Grand Total	**1139372**

SIGN Zwivhuya Tshabuse
DATE 12/12/2022

36 MECHANISMS FOR MONITORING COMPLIANCE

Table 31: Mechanisms for monitoring compliance.

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
General surface rehabilitation Mining Permit area site preparation Opencast mining Site establishment Infrastructure	Alteration of topography	Topography and Landform	Construction Operation Decommissioning Rehabilitation and Closure	Control through site planning and design	Original topography and landform serve as a reference for rehabilitation
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Site establishment	Altered drainage patterns	Topography and Landform	Construction Operation Decommissioning Rehabilitation and Closure	Control through proper soil management procedures	Rehabilitation and closure plan DWAF best practice Guidelines

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Post closure monitoring and maintenance			Operation Decommissioning Rehabilitation and Closure	design and planning (depth of mining, safety factors, overburden and rock qualities)	in consultation with DWA/DMRE
Opencast mining	Impact on geology	Geology	Operation	Modify through mine planning, design and rehabilitation	MPRDA Rehabilitation and Closure Plan
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment	Erosion and sedimentation	Soils	Construction Operation Decommissioning Rehabilitation and Closure	Avoid and control through preventative measures (Soil placement, storm water infrastructure, erosion control structures)	CARA

Infrastructure					

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure	Soil compaction	Soils	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Avoid through implementation of EMPR mitigation measures	Principles of CARA Rehabilitation and Closure Plan

General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation	Soil pollution/contamination	Soils	Construction Operation Decommissioning Rehabilitation and Closure	Avoid through preventative measures (e.g. bunding and spill kits) Remedy through cleanup and waste disposal Modify through soil treatment if required	Hazardous Substances Act NWA NEMA Duty of Care NEMWA Incident reporting procedures

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure					DWAF minimum standards for waste disposal
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment	Loss of soil fertility (denitrification, loss of soil nutrient store and organic carbon stores) and loss of land capability	Land Capability	Construction Operation Decommissioning Rehabilitation and Closure	Avoid through preventative measures (e.g. limit area of disturbance) Remedy through soil remediation if required (e.g. fertilizer and organic matter applications)	CARA Rehabilitation and Closure Plan

Infrastructure					
General surface rehabilitation Infrastructure removal	Loss of soil resource and its utilisation potential	Land Capability	Construction Operation	Avoid through preventative measures (e.g. limit area of disturbance)	CARA Rehabilitation and Closure Plan

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure			Decommissioning Rehabilitation and Closure	Remedy through soil remediation if required (e.g. fertilizer and organic matter applications)	
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and	Damage/disruption of services	Land use	Construction Operation Decommissioning Rehabilitation and Closure	Avoid through implementation of EMPR mitigation measures (e.g. service detection and communication with landowners) Remedy through repair or reinstatement of services if required	Stakeholder Engagement Plan Rehabilitation and Closure Plan

maintenance					

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Site establishment Infrastructure					
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure	Interference with existing land uses	Land use	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Avoid through implementation of EMPR mitigation measures (e.g. communication with landowners)	Stakeholder Engagement Plan Rehabilitation and Closure Plan
General surface rehabilitation	Direct and indirect mortality of flora and fauna	Fauna and Flora	Planning and Design Construction	Control through implementation of EMPR mitigation	NEMBA TOPS

Infrastructure removal Maintenance and operation of site			Operation Decommissioning	measures (e.g. limit area of disturbance, training) Avoid/Stop through	

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure			Rehabilitation and Closure	relocation of threatened or protected species	
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining	Habitat fragmentation and blockage of seasonal and dispersal movements	Fauna and Flora	Construction Operation Decommissioning Rehabilitation and Closure	Avoid and control through implementation of EMPR mitigation measures (e.g. shape of disturbed areas, maintaining corridors)	NEMBA

Post closure monitoring and maintenance Site establishment					

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Infrastructure					
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure	Introduction/invasion of alien (non-native) species	Fauna and Flora	Planning and Design Construction Operation Decommissioning Rehabilitation and Closure	Control through implementation of EMPR mitigation measures (e.g. alien vegetation management plan) Avoid/Stop through preventative measures (e.g. limit extent of disturbance)	NEMBA TOPS Alien Vegetation Management Plan Hazardous Substances Act SANS 10206

General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities	Pollution of surface water resources/decreased water quality	Surface Water	Construction Operation Decommissioning Rehabilitation and Closure	Avoid through implementation of preventative measures (e.g. Bunding, Hazardous materials management, Pollution prevention measures, storm water management)	NWA GN 704 WUL Conditions NEMA Duty of Care NEMA Polluter Pays Principle

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure				Control through implementation of mitigation measures	DWF Best Practice Guidelines
Maintenance and operation of site infrastructure and facilities Water management Infrastructure construction	Decrease in surface water availability	Surface Water	Constructio n Operation	Avoid and control through implementation of preventative measures (e.g. limitation of water usage, water conservation strategies, optimisation of water usage and recycling)	NWA GN 704 WULA Conditions NEMA Duty of Care NEMA Polluter Pays Principle DWF Best Practice Guidelines

General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site	Dewatering of groundwater aquifers	Groundwater	Operation Decommissioning Rehabilitation and Closure	Avoid and control through implementation of preventative measures (e.g. limitation of water usage, water conservation strategies, optimization of water usage and recycling)	NWA GN 704 WULA Conditions NEMA Duty of Care NEMA Polluter Pays Principle DWF Best Practice Guidelines

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure					
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance	Pollution of groundwater/decreased water quality	Groundwater	Construction Operation Decommissioning Rehabilitation and Closure	Avoid and control through implementation of preventative measures (e.g. Bunding, Hazardous materials management, Pollution prevention measures) Control through implementation of mitigation measures (progressive rehabilitation)	NWA GN 704 IWULA Conditions NEMA Duty of Care NEMA Polluter Pays Principle DWF Best Practice Guidelines Rehabilitation and Closure Plan

Site establishment Infrastructure					
Post closure monitoring	General Environmental	Environmental Pollution	Rehabilitation and Closure	Avoid through	MPRDA

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
and maintenance	Pollution			implementation of suitable progressive rehabilitation and soil management Control/Remedy through interception of decant and treatment of polluted water where required	NWA NEMA Duty of Care NEMA Polluter Pays Principle NEMW A GN 704 DWF Best Practice Guidelines Rehabilitation and Closure Plan
General decommissioning activities Infrastructure removal	General Environmental Pollution	Environmental Pollution	Planning and Design Construction Operation Decommissioning	Avoid through preventative measures (e.g. bunding, spill kits) Remedy through cleanup and waste disposal	Hazardous Substances Act NWA MSDS OHSA MHS A

			Rehabilitation and Closure	Modify through soil treatment if required	NEMA Duty of Care NEMWA Incident Reporting Procedures DWAF Minimum Standards for Waste Disposal
General surface rehabilitation	Hydrocarbon spills/contamination	Environmental Pollution	Planning and Design	Avoid through preventative measures (e.g. bunding,	Hazardous Substances Act

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure			Construction Operation Decommissioning Rehabilitation and Closure	spill kits) Remedy through cleanup and waste disposal Modify through soil treatment if required	NWA OHSA MHS A NEMA Duty of Care NEMWA Incident Reporting Procedures DWAF Minimum Standards for Waste Disposal
Opencast mining	Discovery and preservation of fossils	Heritage	Operation	Avoid and control through implementation of preventative measures Modify through removal and curation of fossils	

General surface rehabilitation Infrastructure removal Maintenance and operation of site	Destruction/damage of palaeontological resources	Heritage	Constructio n Operation Rehabilitation and Closure	Avoid and control through implementation of preventative measure Modify through removal and curation of fossils	NEMA MPRD A NHRA SAHRA permitting requirements Human Tissue Act

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure					IFC Performance Standard 8: Cultural Heritage
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining	Destruction/damage of heritage resources	Heritage	Construction Operation Decommissioning Rehabilitation and Closure	Avoid and control through implementation of preventative measures (e.g. fencing of graveyards, watching brief, chance finds procedure) Stop through relocation of graves if required	NEMA MPRD A NHRA SAHRA permitting requirements Human Tissue Act IFC Performance Standard 8: Cultural Heritage

Post closure monitoring and maintenance Site establishment					

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Infrastructure					
General construction management General opencast management	Crime and violence	Social	Constructio n Operation Decommissioning Rehabilitation and Closure	Avoidance and control through preventative measures (e.g. site security, code of conduct)	ESMS MHS A OHSA Code of Conduct
General construction management General opencast management Mining Permit area site preparation Opencast pit mining	Influx of migrant workers	Social	Construction Operation Decommissioning Rehabilitation and Closure	Avoidance and control through mitigation measures (e.g. recruitment procedure, grievance mechanism)	Labour Act Basic Conditions of Employment Act IFC Performance Standard 5 Land Acquisition and Involuntary Resettlement
General surface rehabilitation	Sense of place	Social	Construction Operation	Modify through reduction of visual impact	Rehabilitation and Closure Plan

Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation			Decommissioning Rehabilitation and Closure		

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure					
General construction management General opencast pit management Maintenance and operation of site infrastructure and facilities Opencast mining	Social vices	Social	Construction Operation Decommissioning Rehabilitation and Closure	Avoidance and control through mitigation measures (e.g. recruitment procedure, grievance mechanism, code of conduct) Stakeholder engagement plan	Labour Act Basic Conditions of Employment Act IFC Performance Standard 5 Land Acquisition and Involuntary Resettlement Grievance Mechanism Code of Conduct

General Construction Management General opencast management Opencast mining	Employment opportunities	Socio-Economic	Construction Operation Decommissioning Rehabilitation and Closure	Minimise impacts of job loss through skills development and livelihood restoration	IFC Performance Standard 5 Land Acquisition Involuntary Resettlement
Opencast mining	Coal supply to the market	Socio-Economic	Operation	Maximise security of Coal supply through	ESMS

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
				sound and responsible mine management	
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure	Health and safety	Health and Safety	Construction Operation Decommissioning Rehabilitation and Closure	Avoidance and control through preventative measures (e.g. HIV/AIDS awareness) Remedy through application of mitigation measures in EMPR	OHSA MHS A IFC Performance Standard 4: Community Health, Safety, and Security Grievance Mechanism

General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities	Fire and explosion hazard	Health and Safety	Constructio n Operation	Avoid and control through implementation of preventative measures (e.g. Fire breaks, Blasting procedures, hazardous substances management	Explosives Act MHSA OHSA MPRD A United States Bureau of Mines (USBM) criteria for safe blasting for ground

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure					vibration and recommendations on blasting
Opencast mining	Fly rock	Health and Safety	Operation	Avoid and control through implementation of preventative measures (e.g. blast procedures, monitoring, communication with landowners, emergency response procedures)	Explosives Act MHSA OHSA MPRDA United States Bureau of Mines (USBM) criteria for safe blasting for ground vibration and recommendations on air blast

					Blast Procedures Emergency response procedure IFC Performance Standard 4: Community Health, Safety, and Security

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure	Damage to road infrastructure	Transportation, Infrastructure and Traffic	Construction Operation Decommissioning	Avoid and control through implementation of EMPR mitigation measures (e.g. speed limit enforcement, vehicle maintenance)	National Road Traffic Act OHSA MHSA

General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation	Increased traffic	Transportation, Infrastructure and Traffic	Construction Operation	Avoid and control through implementation of EMPR mitigation measures (e.g. speed limit enforcement, vehicle maintenance)	National Road Traffic Act OHSA MHSA

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure					
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and	Visual impact of mine infrastructure, stockpiles and dust	Visual	Construction Operation Decommissioning Rehabilitation and Closure	Avoid and control through implementation of EMPR mitigation measures (e.g. vehicle maintenance, progressive rehabilitation)	Rehabilitation and Closure Plan Final Land-use Objectives

maintenance Site establishment Infrastructure					
General surface rehabilitation	Greenhouse gas emissions	Air Quality	Construction Operation	Avoid and control through implementation of EMPR	NEMAQA Equator Principles

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment Infrastructure			Decommissioning Rehabilitation and Closure	mitigation measures (e.g. vehicle maintenance, progressive rehabilitation)	IFC Performance Standard 3: Resource Efficiency and Pollution Prevention
General surface rehabilitation Infrastructure removal Maintenance and operation of site	Fugitive emissions (Dust)	Air Quality	Constructio n Operation Decommissioning Rehabilitation and Closure	Avoid through preventative measures (e.g. speed limit enforcement) Control through implementation of EMPR mitigation	Road Traffic Act NEMAQA Dust Regulations

infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring				measures (e.g. dust suppression)	

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
and maintenance Site establishment Infrastructure					
General surface rehabilitation Infrastructure removal Maintenance and operation of site infrastructure and facilities Mining Permit area site preparation Opencast mining Post closure monitoring and maintenance Site establishment	Disturbing and/or nuisance noise		Construction Operation Decommissioning Rehabilitation and Closure	Avoid through preventative measures (e.g. communication with landowners, timing of activities) Control through implementation of EMPR mitigation measures (e.g. Noise abatement measures)	ECA Noise Regulations SANS 10103 OHSA MHSA

Infrastructure					
Opencast mining	Blasting	Blasting and Vibration	Operation	Avoid and control through implementation of preventative measures (e.g. blast procedures, monitoring,	Explosives Act MHSA OHSA MPRDA United States Bureau of

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
				communication with landowners, emergency response procedures)	Mines (USBM) Criteria for Safe Blasting for Ground Vibration Blast Procedures Emergency Response Procedure IFC Performance Standard 4: Community Health, Safety, and Security

Opencast mining	Ground vibration and human perception	Blasting and Vibration	Operation	Avoid and control through implementation of preventative measures (e.g. blast procedures and monitoring, communication with landowners and emergency response procedures)	Explosives Act MHSA OHSA MPRD A United States Bureau of Mines (USBM) Criteria for Safe Blasting for Ground Vibration Blast Procedures Emergency Response Procedure IFC Performance Standard 4: Community Health, Safety, and Security

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Opencast mining	Impacts on Infrastructure (roads, communications infrastructure, services, houses, boreholes)	Blasting and Vibration	Operation	Avoid and control through implementation of preventative measures (e.g. structural surveys, blast procedures, monitoring and communication with landowners)	Explosives Act MHSA OHSA MPRD A United States Bureau of Mines (USBM) Criteria for Safe Blasting for Ground Vibration Blast Procedures Emergency Response Procedure IFC Performance Standard 4: Community Health, Safety, and Security

Opencast mining	Noxious fumes	Blasting and Vibration	Operation	Avoid and control through implementation of preventative measures (e.g. structural surveys, blast procedures, monitoring, and communication with landowners)	Explosives Act MHSA OHSA MPRD A United States Bureau of Mines (USBM) Criteria for Safe Blasting for Ground Vibration Blast Procedures Emergency Response

Activity	Potential impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
					Procedure IFC Performance Standard 4: Community Health, Safety, and Security

37 FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT/ENVIRONMENTAL AUDIT REPORT

The result of environmental monitoring and compliance to the approved EMPR will be undertaken every second year and submitted to the DMRE in the form of an environmental performance assessment. Included in the report will be the following relevant information:

- The period when the performance assessment was conducted.
- The scope of the assessment.
- The procedures used for conducting the assessment.
- Interpreted information gained from monitoring the EMPR.
- Evaluation criteria used during the assessment.
- Results of the assessment are to be discussed and mention must be made of any gaps in the EMPR and how it can be rectified.
- Yearly updated layout plans.

Any emergency or unforeseen impacts will be reported immediately to the DMRE and other relevant government departments.

38 ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

Management of operational risk is a key consideration for mines/pits operating within the social and economic context of South Africa. Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. Operational risks and impacts are usually managed through the implementation of the Environmental and Social Management System (ESMS) and Safety, Health and Environmental (SHE) system. A formal, effective ESMS is an important requirement for establishing and maintaining effective environmental management and should be undertaken during the planning phase of the Project. As such the Applicant shall be required to appoint a suitably qualified specialist to develop the ESMS to be implemented on the mine. Adequate resources (people, financial and technical) need to be made available to ensure effective establishment, implementation, maintenance and continual improvements of the ESMS. The roles and responsibilities for these key environmental personnel should be clearly defined and communicated throughout the organisation. The ESMS should include the requirement to constantly monitor environmental performance and assess the adequacy of environmental resources provided for the Mine. If required, the Mine would need to procure further environmental resources to ensure the successful implementation of the ESMS and EMPR. The development and implementation of an ESMS is a requirement in terms of compliance with international standards of best practise such as the IFC Performance Standards and Equator principles

38.1 ESMS Framework

The ESMS will be based on:

- South African legal requirements.
- Mining best practice.

The ESMS to be developed for the Mine should incorporate and provide for:

- A project specific environmental policy.
- Organizational capacity and competency
- The ESMS shall identify roles and responsibilities of key role players.
- The ESMS shall incorporate a mechanism for ongoing identification of risks and impacts (e.g. Impacts and aspects register of an ISO system).
- Integration of the ESMS with the SHE management system may be undertaken to form a holistic SHE risk management system.
- The ESMS shall comprise appropriate management plans and procedures to ensure effective operational control.
- The ESMS shall provide for emergency response and also make provision for emergency protocols.
- Effective communication (both internal and external) is a key requirement for successful implementation of the ESMS and an appropriate communication procedure to this effect shall be developed.
- The ESMS shall involve engagement between the client, its workers, local communities directly affected by the project (the affected communities) and where appropriate, other stakeholders. It is therefore imperative that there is integration between Stakeholder Engagement procedures and the ESMS.
- The ESMS shall make provision for ongoing compliance monitoring and environmental audits.
- The ESMS shall make provision for internal auditing and continual improvement which should be incorporated into internal management review processes. The ESMS should provide for setting and reviewing objectives and targets to demonstrate continual SHE improvements associated with the project.

Ultimately an effective ESMS should provide for effective management of social and environmental risks and impacts whilst maintaining legal compliance and meeting international standards of best practise where these are feasible and appropriate.

38.2 Stakeholder Engagement

Social impacts occur immediately in the planning phase of a project and as such it is imperative to start with stakeholder engagement as early in the process as possible. Stakeholder engagement is required on an ongoing basis throughout the operation of the mine. As such, the mine will need to develop and implement a detailed Stakeholder Engagement Plan, designed to work as a living document for implementation over the entire duration of the project.

The following stakeholder engagement framework outlines the principles and objectives for stakeholder engagement during all phases of the mining operation.

- To identify and assess the processes and/or mechanisms that will improve the communication between local communities, the wider community and the small-scale mine.
- To improve relations between mine staff and the people living in the local communities.
- To provide a guideline for the dissemination of information crucial to the local communities in a timely, respectful and efficient manner.
- To provide a format for the timely recollection of information from the local communities in such a way that the communities are included in the decision-making process.

This stakeholder engagement plan will assist the mine to outline their approach towards communicating in the most efficient way possible with stakeholders throughout the life of the project. Such a plan cannot be considered a once off activity and should be updated on a yearly basis to ensure that it stays relevant and to capture new information. The Stakeholder Engagement Plan should be compiled in line with IFC Guidelines (IFC) and should consist of the following components:

- Stakeholder Identification and Analysis – time should be invested in identifying and prioritising stakeholders and assessing their interests and concerns. Information Disclosure – information must be communicated to stakeholders early in the decision- making process in ways that are meaningful and accessible, and this communication should be continued throughout the life of the project.
- Stakeholder Consultation – each consultation process should be planned out, consultation should be inclusive, the process should be documented, and follow-up should be communicated.
- Negotiation and Partnerships – add value to mitigation or project benefits by forming strategic partnerships and for controversial and complex issues, enter into good faith negotiations that satisfy the interest of all parties.
- Grievance Management – accessible and responsive means for stakeholders to raise concerns and grievances about the project must be established throughout the life of the project.
- Stakeholder Involvement in Project Monitoring – directly affected stakeholders must be involved in monitoring project impacts, mitigation and benefits. External monitors must be involved where they

can enhance transparency and credibility.

- Reporting to Stakeholders – report back to stakeholders on environmental, social and economic performance, both those consulted and those with more general interests in the project and parent company.
- Management Functions – sufficient capacity within the company must be built and maintained to manage processes of stakeholder engagement, track commitments and report on progress.

It is of critical importance that stakeholder engagement takes place in each phase of the project cycle and it must be noted that the approach will differ according to each phase

38.3 Grievance Mechanism

In accordance with international good practice the mine shall establish a specific mechanism for dealing with grievances. A grievance is a complaint or concern raised by an individual or organisation that judges that they have been adversely affected by the project during any stage of its development. Grievances may take the form of specific complaints for actual damages or injury, general concerns about project activities, incidents and impacts, or perceived impacts. The IFC standards require Grievance Mechanisms to provide a structured way of receiving and resolving grievances. Complaints should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities and is at no cost and without retribution. The mechanism should be appropriate to the scale of impacts and risks presented by a project and beneficial for both the company and stakeholders. The mechanism must not impede access to other judicial or administrative remedies.

The proposed grievance mechanism shall be based on the following principles:

- Transparency and fairness.
- Accessibility and cultural appropriateness.
- Openness and communication regularity.
- Written records.
- Dialogue and site visits.
- Timely resolution.

Based on the principles described above, the grievance mechanism process involves four stages:

- Receiving and recording the grievance.
- Acknowledgement and registration.
- Site inspection and investigation.
- Response.

38.4 Internal Grievance Procedure

The mine shall develop a detailed internal grievance mechanism designed to receive and facilitate resolution of workplace concerns and grievances raised by employees (and their organizations, where they exist). Employees must be informed of the grievance mechanism at the time of recruitment and it must be made easily accessible to them. The mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retribution. The mechanism should also allow for anonymous complaints to be raised and addressed. The mechanism should not impede access to other judicial or administrative remedies that might be available under the law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.

Document Control

A formal document control system should be established during the development of the ESMS. The document control system must provide for the following requirements:

- Documents are approved for adequacy prior to use.
- Review and update documents as necessary and re-approve documents.
- Ensure that changes and the current version status of documents are identified.
- Ensure that relevant versions of applicable documents are available at points of use.
- Ensure that documents remain legible and readily identifiable.
- Ensure that documents of external origin necessary for the ESMS are identified and their distribution controlled.
- Prevent unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.

38.5 Record Keeping

It is essential that an official procedure for control of records be developed to ensure records required to demonstrate conformity to environmental and social standards are maintained. This project is therefore required to develop and maintain a procedure for the identification, storage, protection, retrieval, retention and disposal of records as part of the ESMS. Records must be legible, identifiable and traceable.

38.6 Auditing and Reporting Procedures

The Mining Permit holder shall develop and auditing and reporting procedure, for conveying information from the compliance monitoring activities and to ensure that management is able to take rapid corrective action should certain thresholds be exceeded. The sections below present a framework for the development

of the necessary procedures. Different reporting mechanisms may include:

- Inspections
- Accidents and emergencies
- Measuring performance indicators and interpreting and acting on the indicators
- Records of monitoring activities to test the effectiveness of mitigation measures and impact controls, as well as for compliance auditing purposes
- Training programmes and evidence of appropriate levels/amount of skills/capacities created
- All monitoring and auditing must be accompanied by applicable records and evidence (e.g. delivery slips, photographic records, etc.). All reports must be retained and made available for inspection by the ECO, the Applicant and /or the Relevant Competent Authorities. All reports shall be signed by the relevant parties to ensure accountability. The Mining Permit holder must use the audit report findings to continually ensure that environmental protection measures are working effectively on site through a system of self-checking. The EMPR should be viewed as a dynamic document aimed at continual environmental performance improvement.

The following auditing and reporting shall be required throughout the operation phase:

- Weekly Compliance Reports: These reports must be prepared by the designated Pit EO and must aim to monitor and report on-site environmental performance
- Quarterly Compliance Audit Reports: The ECO must compile quarterly compliance audit reports which are to be submitted to the Mining Permit holder for his review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified.

38.7 Responding to Non-Compliances

Non-compliance will be identified and managed through the following four key activities including:

- Inspections of the site and activities across the site
- Monitoring of selected environmental quality variables
- Audits of the site and relevant documentation as well as specific activities
- Reporting on a monthly basis

An environmental non-conformance and incident register must be prepared and maintained by the ECO throughout the lifespan of the small-scale mine in order to monitor environmental concerns, incidents, and non- conformances. The register must include details of date, location, description of the NC or Incident,

applicable environmental commitment/standard, corrective action taken, adequacy of corrective action, date rectified, etc.

Non-compliance with the EMPR or any other environmental legislation, specifications or standards shall be recorded by the ECO in the non-conformance register. This register shall be maintained by the ECO and will be sent to the Mining Permit holder and Contractor on a regular basis (quarterly), and the Mining Permit holder shall ensure that the responsible party takes the necessary corrective actions. Non-conformances may only be closed out in the register by the ECO upon confirmation that adequate corrective action has been taken. The register should be utilised to measure overall environmental performance.

38.8 Environmental Incidents

For the purposes of this project, an environmental incident can be divided into three levels, i.e. major, medium and minor. All major and medium environmental incidents shall be recorded in the incident register. Minor incidents do not need to be reported but require immediate rectification on site. Definitions and examples of environmental incidents are provided in Table 32.

Table 32: Description of incidents and non-conformances for the purpose of the project.

Non-Conformance	Any deviation from work standards, practices, procedures, regulations, management system performance etc. that could either directly or indirectly lead to injury or illness, property damage, damage to the workplace environment, or a combination of these.
Major Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread, long-term, irreversible significant negative impact on the environment and/or has a high risk of legal liability.

	A major environmental incident usually results in a significant pollution and may entail risk of public danger. Major environmental incidents usually remain an irreversible impact even with the involvement of long-term external intervention i.e. expertise, best available technology, remedial actions, excessive financial cost etc. Major environmental incidents may be required to be reported to the authorities. The ECO shall make the final decision as to whether a particular incident should be classified as a Major incident. An example of a Major environmental incident would be a significant spillage (e.g. 500 litres) of fuel into a watercourse.
Medium Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread or localised, short term, reversible significant negative impact on the environment and/or has a risk of legal liability. A medium environmental incident may be reported to the authorities, can result in significant pollution or may entail risk of public danger. The impact of medium environmental incidents should be reversible within a short to medium term with or without intervention. The ECO shall make the final decision as to whether a particular incident should be classified as a Medium incident. An example of a Medium environmental incident would be a large spill of fuel (e.g. 20 – 50 litres) onto land.
Minor Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, where the environmental impact is negligible immediately after occurrence and/or once-off intervention on the day of occurrence. An incident where there is unnecessary wastage of a natural resource is also classified as a minor environmental incident. An example would be leaking water pipes that result in the wastage of water. A minor environmental incident is not reportable to authorities. An example of a minor incident is day to day spills of fuel or oil onto the ground where the spill is less than one or two litres.

The following incident reporting procedures shall apply to this project:

- All environmental incidents shall be reported to Contractor's EO and Pit EO who shall ensure that the appropriate rectification is undertaken.
- The Pit EO shall record all medium and major incidents in the incident register and advise on the appropriate measures and timeframes for corrective action.
- An incident report shall be completed by party responsible for the incident for all medium and major incidents and the report shall be submitted to the Pit Manager and Pit EO within 5 calendar days of the incident.
- The Pit EO shall investigate all medium and minor incidents and identify any required actions to prevent a recurrence of such incidents.

In the event of an emergency incident (unexpected sudden occurrence), including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed, the Applicant shall notify the relevant authorities in accordance with legal requirements (e.g., Section 30 of NEMA and Section 20 of the NWA). In the event of a dispute in terms of the classification of a such an incident, the Applicant shall engage the ECO to advise on the potential reporting requirements in terms of the above.

39 ENVIRONMENTAL AWARENESS PLAN AND TRAINING

No Training and environmental awareness is an integral part of a complete EMPR. The overall aim of the training will be to ensure that all site staff is informed of their relevant requirements and obligations pertaining to the relevant authorisations, licences, permits and the approved EMPR and protection of the environment.

The applicant and contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and are capable of complying with the relevant environmental requirements. To obtain buy-in from staff, individual employees need to be involved in:

- Identifying the relevant risks.
- Understanding the nature of risks.
- Devising risk controls.
- Given incentive to implement the controls in terms of legal obligations.

The applicant shall ensure that adequate environmental training takes place. All employees shall have been

given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. All training must be formally recorded, and attendance registers retained. The environmental training should, as a minimum, include the following:

- General background and definition to the environment.
- The environmental impacts, actual or potential, of their work activities.
- Compliance with mitigation measures proposed for sensitive areas.
- The environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving compliance with the environmental policy and procedures and with the requirement of the applicant's environmental management systems, including emergency preparedness and response requirements.
- The potential consequences (legal and/or other) of departure from specified operating procedures.
- The mitigation measures required to be implemented when carrying out their work activities.
- All operational risks must be identified, and processes established to mitigate such risk, proactively. Thus, the applicant needs to inform the employees of any environmental risks that may result from their work, and how these risks must be dealt with in order to avoid pollution and/or degradation of the environment.
- In the case of new staff (including contract labour) the contractor / applicant shall keep a record of adequate environmental induction training. he importance of compliance with all environmental policies.

Manner in Which Employees will be Informed of Environmental Risks

Environmental awareness could be fostered by induction course for all personnel on site, before commencing site visits. Personnel should also be alerted to particular environmental concerns associated with their tasks for the area in which they are working. Courses must be given by suitably qualified personnel and in a language and medium understood by personnel. The environmental awareness training programme will include the following:

- Occupational Health and Safety Training (OHS).
- Environmental Awareness Training EMPR management actions.

Environmental awareness training will focus on the following specific aspects and be undertaken in "Toolbox talk "topics prior to site access:

- Waste collection and disposal.
- EMPR management options and application.

39.1 Manner in which Risks will be Dealt with to Avoid Pollution or Degradation

The broad measures to control or remedy any causes of pollution or environmental degradation as a result of the proposed mining activities taking place are provided below:

- Contain potential pollutants and contaminants (where possible) at source.
- Handling of potential pollutants and contaminants (where possible) must be conducted in bunded areas and on impermeable substrates.
- Ensure the timeous clean-up of any spills.
- Implement a waste management system for all waste present on site.
- Investigate any I&AP claims of pollution or contamination as a result of mining activities.
- Implement the impact management objectives, outcomes and actions, as described in Section 12 above.

It is of critical importance that the broad measures to control or remedy any causes of pollution or environmental degradation are applied during onsite mining activities.

40 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional information was requested or is deemed necessary.

41 ENVIRONMENTAL MONITORING

41.1 Functional Requirements of Monitoring Programmes

The purpose of monitoring is not merely to collect data, but to provide information necessary to make informed decisions on managing and mitigating potential impacts. Monitoring therefore serves the following functions:

- Serve as early warning system to detect any potential negative impacts.
- To provide information to feedback into management controls to avoid, prevent or minimise potential negative impacts.
- Provide quantitative data that can serve as evidence for the presence of negative impacts or the lack thereof.
- Allows for trending, modelling and prediction of future conditions or potential impacts.

Based on the above, the small-scale mine must ensure that monitoring programmes comprise of the

following (at a minimum) in order to obtain valuable environmental data:

- Environmental aspect monitoring must be a formalised procedure.
- All equipment used in monitoring must be correctly calibrated and serviced regularly.
- Samples required for analysis will be sent to an independent and accredited laboratory.
- Monitoring data must be stored.
- Data must be checked and interpreted and tending undertaken on a quarterly basis.
- Both the date and reports on environmental monitoring must be kept on record for the life of mine and where relevant provided to I&APs.
- The general and site specific parameters to be monitored must be identified by an independent specialist, the authorities and where relevant I&APs.

41.2 List of Aspects that Require Monitoring Plans

The list of aspects that require on-going environmental monitoring includes the following:

- Air quality.
- Blasting and vibration.
- Surface water.
- Groundwater.
- Noise.
- Traffic.
- Rehabilitation.

As mines/pits and the environment are both dynamic it is likely that future scenarios may require the monitoring of additional or unforeseen impacts. As such, the list provided is by no means conclusive and must instead be used as a guideline for the impacts that require monitoring.

41.3 Monitoring Plans for Environmental Aspects

The monitoring of various environmental aspects and the impact on them as a result of the proposed project shall take place by means of both quantitative and qualitative techniques in order to determine whether or not the requirements of the Environmental Management Programme are being complied with. The importance and value of detailed environmental monitoring networks cannot be overstated.

Environmental monitoring serves as a tool to track compliance, assist with potential liability identification, and mitigation throughout the life of the proposed project. This is achieved through the provision of actual evidence-based monitoring and reporting thereof. In essence, monitoring is a continuous data-gathering, data interpreting, and control procedure that ranges from visual inspection to in-depth investigative monitoring and reporting. These monitoring plans need to be drawn into standalone plans that can be updated and amended as per authority requirements and additional data requirements identified during the mining activities. These plans need to include the site-specific roles and responsibilities for actions.

42 UNDERTAKING

- The EAP herewith confirms:

  (a) The correctness of the information provided in the reports.

  (b) The inclusion of comments and inputs from stakeholders and I&APs.

  (c) The inclusion of inputs and recommendations from the specialist reports where relevant.

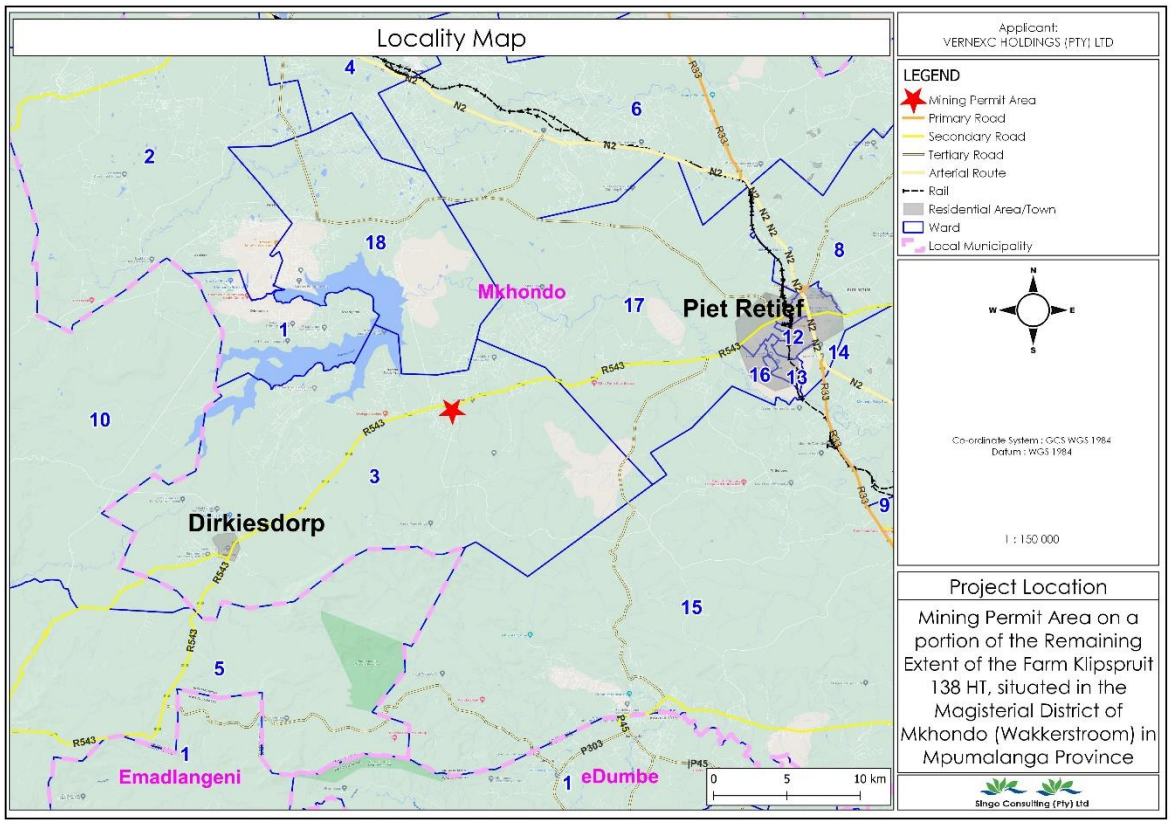
  (d) That the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.

Signature of the environmental assessment practitioner

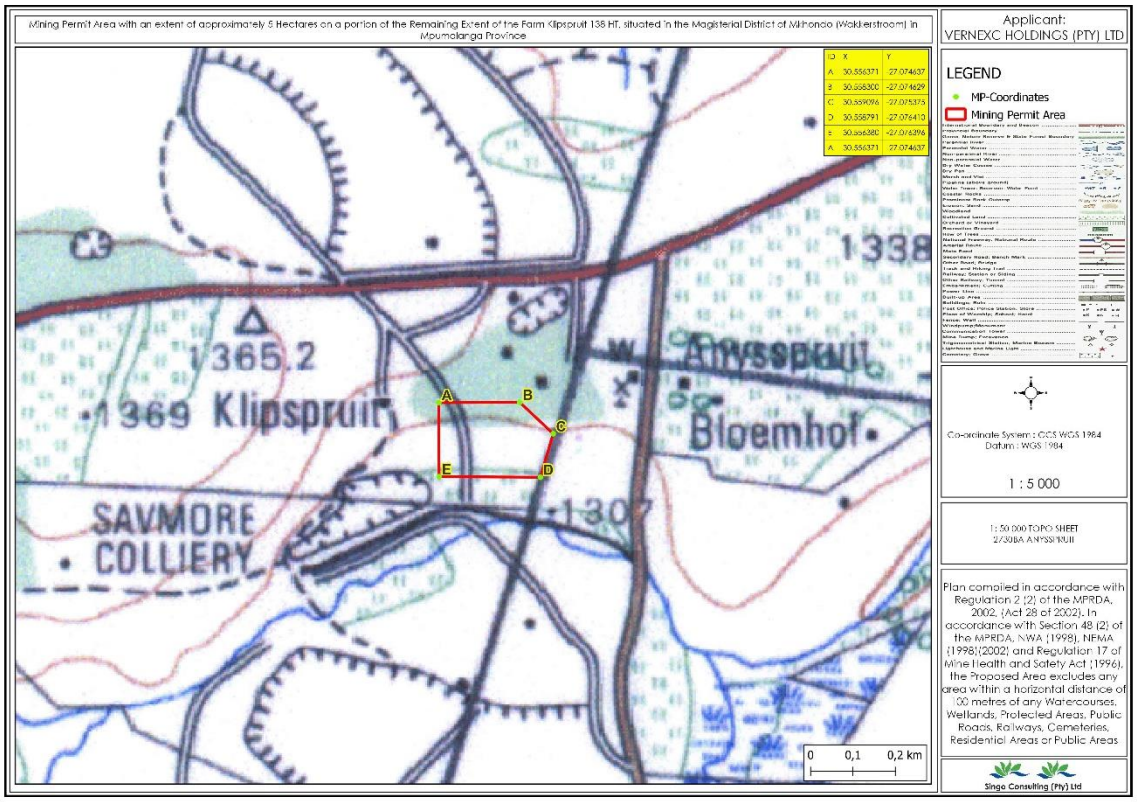
Name of company (if applicable):

Date:

Appendix 1: Project Maps

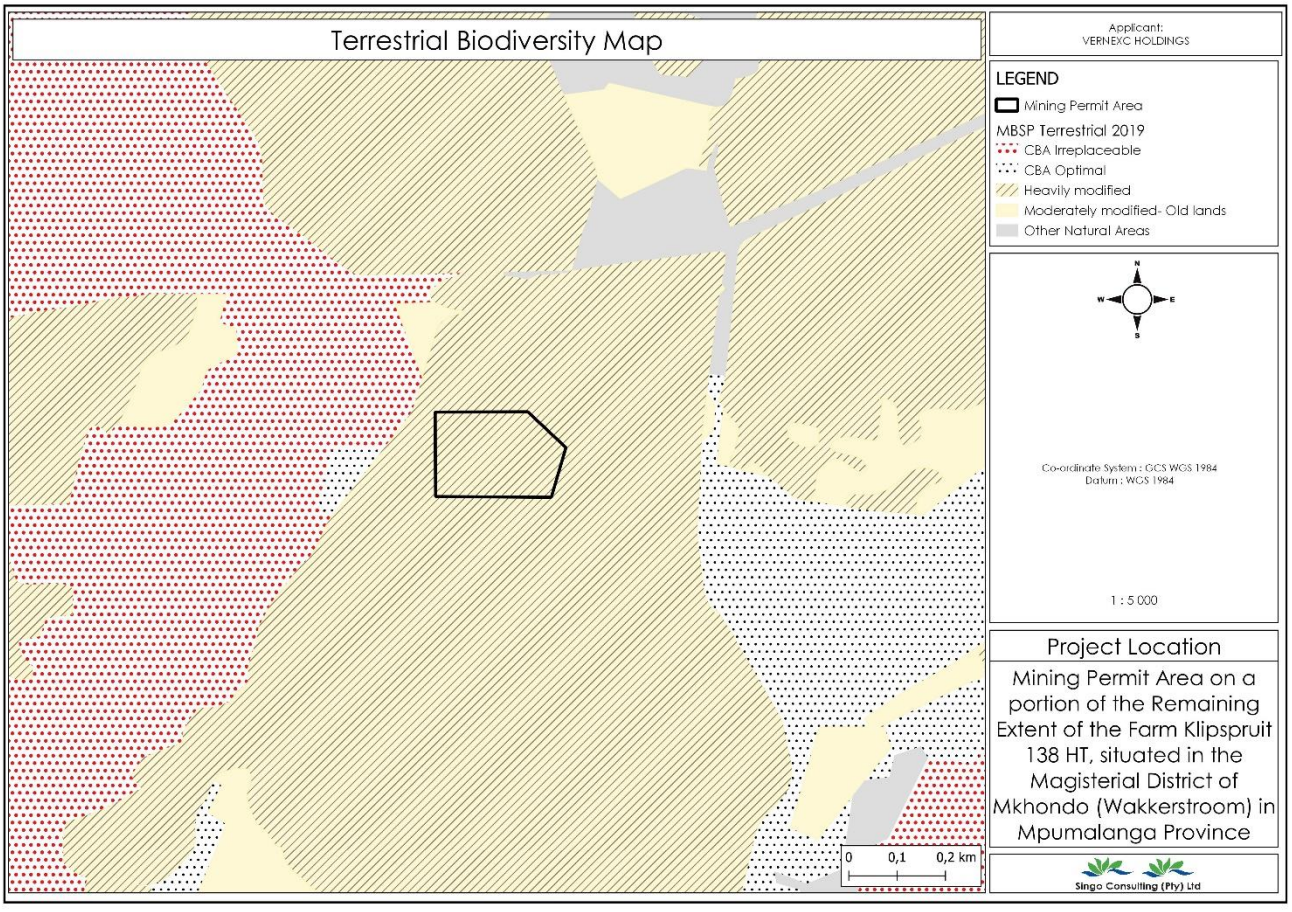


Locality Map

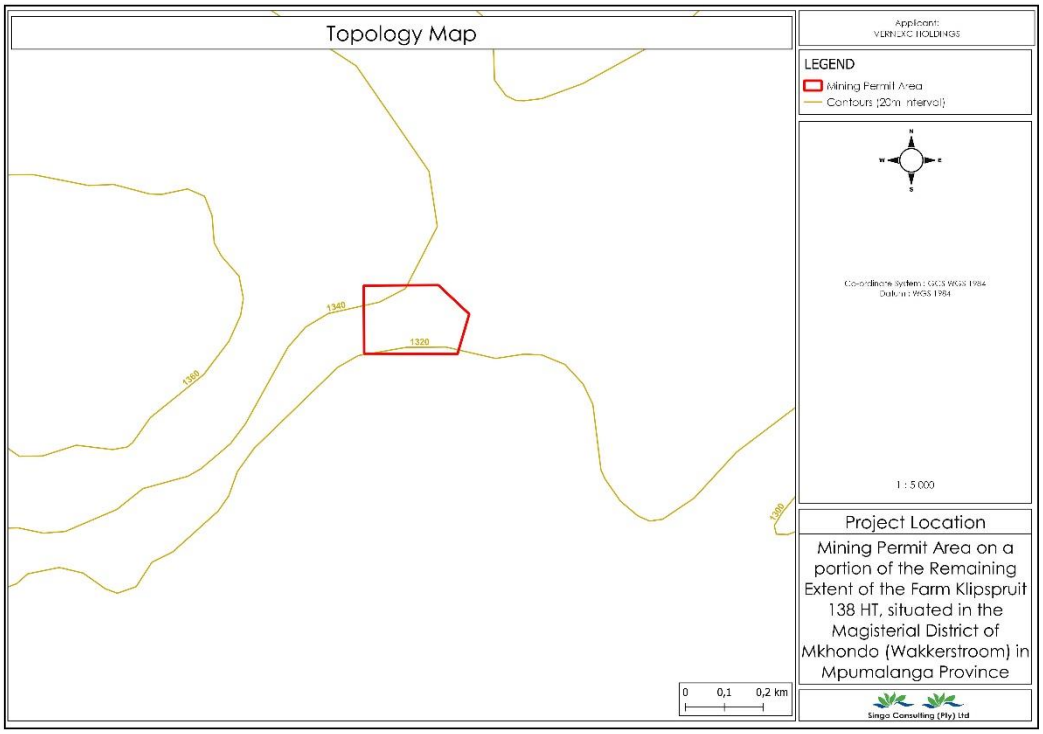


Reg 2.2

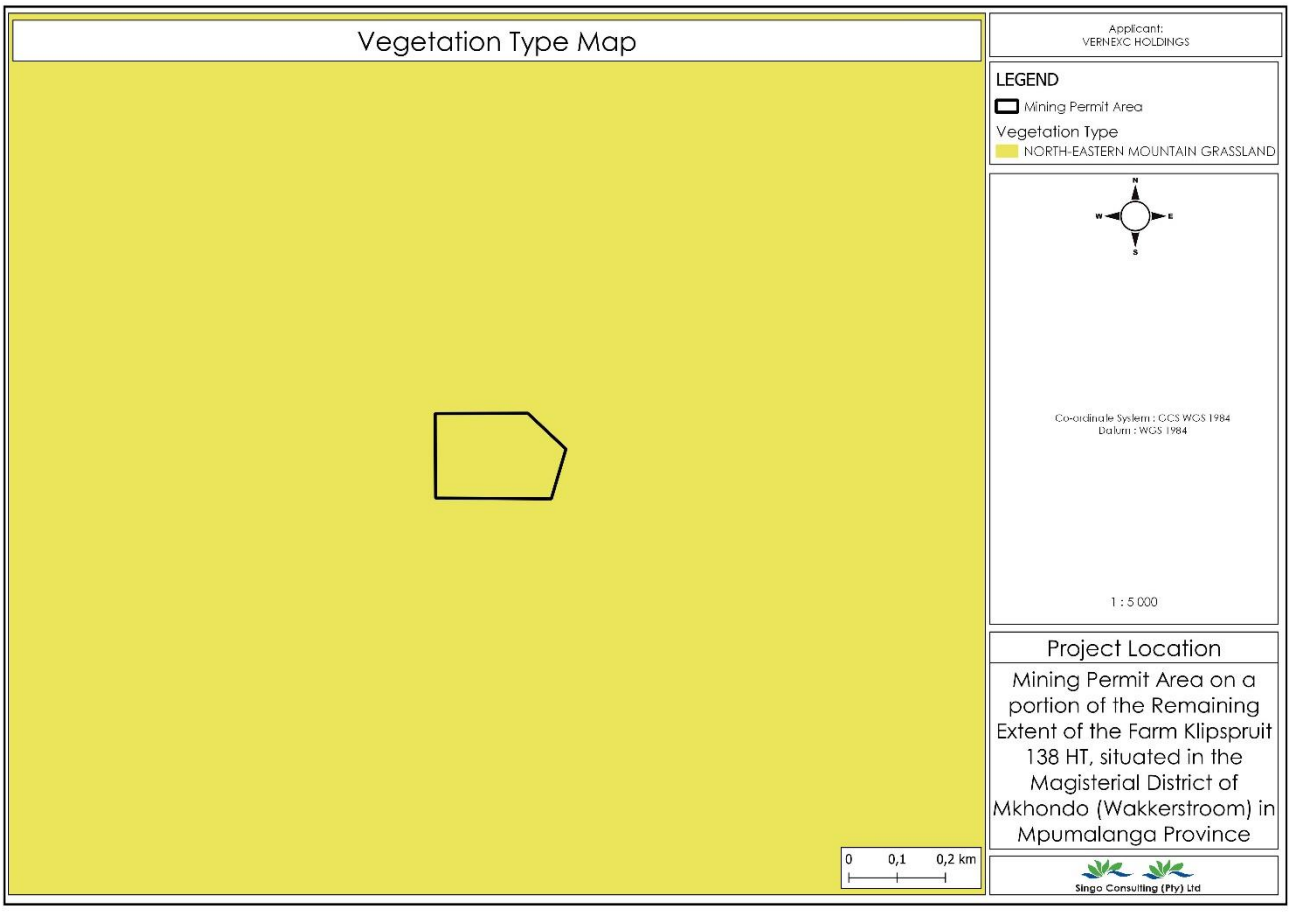
Soil Classes Map



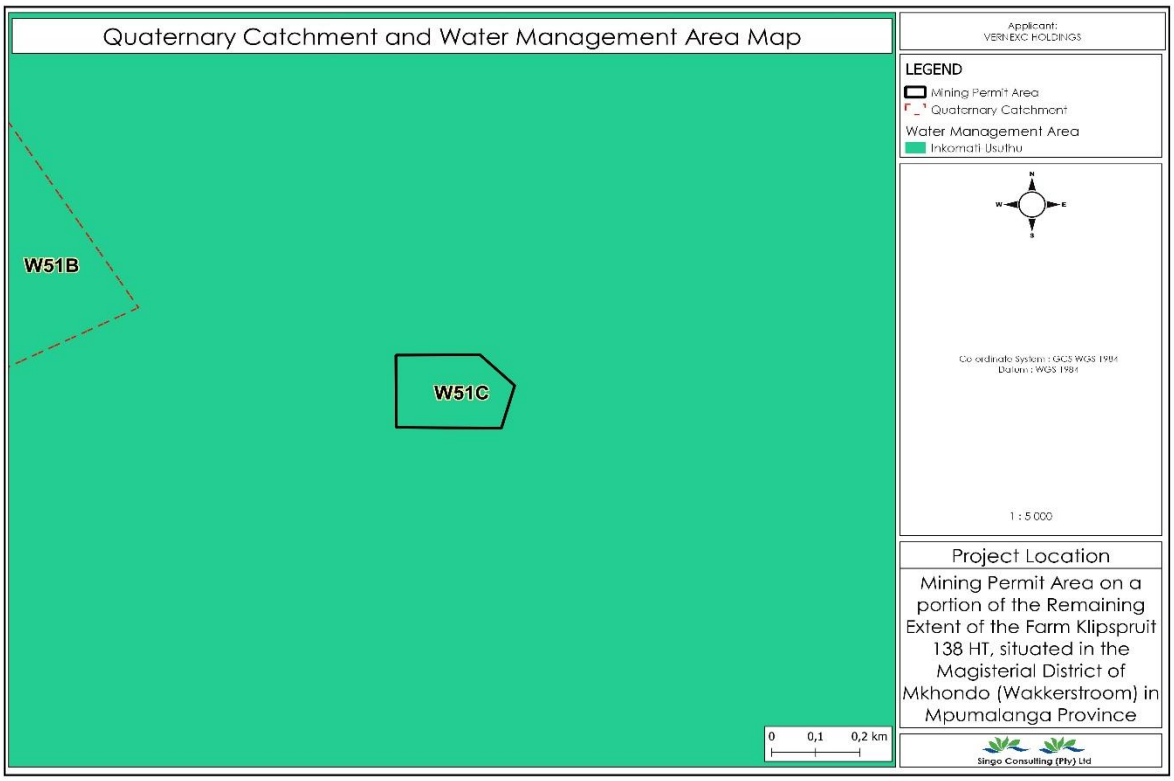
Terrestrial Biodiversity Map



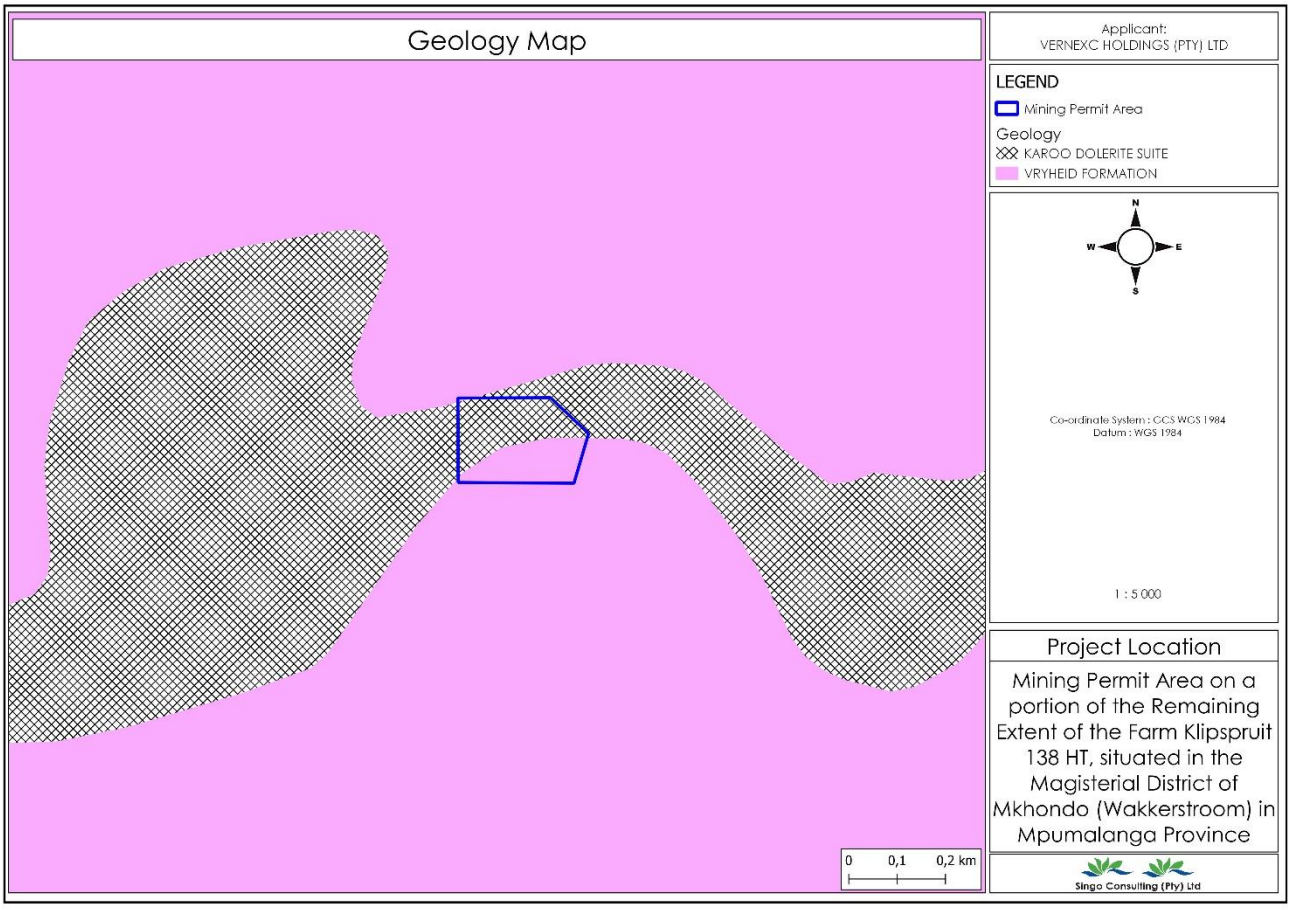
Topology Map



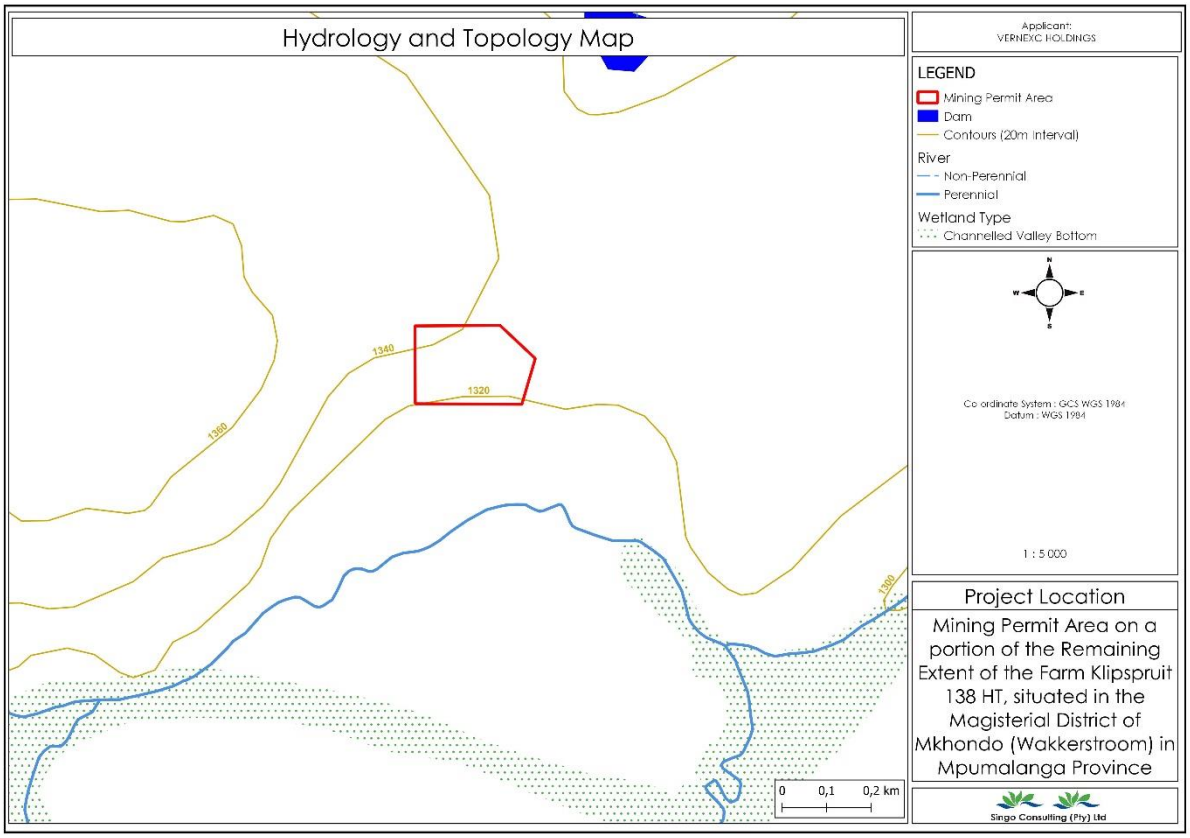
Vegetation Map



Quaternary Catchment Map



Geology Map



Hydro-Topo Map

Appendix 2: BID

BACKGROUND INFORMATION DOCUMENT

APPLICANT:

VERNEX HOLDINGS (Pty) Ltd

Physical address: 4695 Monyai Street, Ackerville, Witbank Mpumalanga 1039

Contact person: Mr. William Sindane

Tel: +27 63 342 6983

Email: wlmprojects2@gmail.com

DMRE Ref: MP 30/5/1/1/3/13020 MP

CONSULTANT:

Singo Consulting (Pty) Ltd

P/Bag X7297, Postnet Suite 87, Witbank, 1035

Office 870

05 Balalaika St

Tasbet Part Ext 2

Witbank

1040

Environmental Technician: Zwivhuya Tshabuse

Tel: +27 13 6920 041

Cell: +27 67 904 7475

Email: admin@singoconsulting.co.za

zwivhuya@singoconsulting.co.za

INTRODUCTION AND THE PURPOSE OF THIS DOCUMENT

Singo Consulting (Pty) Ltd has been appointed as an independent Environmental Consultant by **Vernex Holdings (Pty) Ltd** to conduct Environmental Impact Assessment (EIA) through Basic Assessment, compile a Basic Assessment Report and an Environmental Management Programme report (BAR & EMPr) and undertake Public Participation Process (PPP). This is done for processes of acquiring Environmental Authorization for the proposed Mining Permit Application within **portion of the Remaining Extent of the Farm Klipspruit 138 HT**, under the **Magisterial District of Mkhondo (Wakkerstroom), Mpumalanga Province (DMRE Ref: MP 30/5/1/1/3/13020 MP).**

The Purpose of this Background Information Document (BID) is to provide a perfunctory description of the project and outline EIA processes to be followed and contributions from Interested and Affected Parties (I&APs) on the issues related to the project in question, allowing comments and concerns to be raised. Results of the EIA through basic assessment, both negative and positive will be submitted and made available to the relevant Departments such as the Department of Mineral Resources and Energy, and if requested, Department of Forestry, Fisheries and the Environment, Department of Water and Sanitation, landowners, and other interested stakeholders.

This BID therefore requests and invites I&APs to comment on the environmental, physical, social and economic impacts associated with the proposed mining activities. Be assured that your comments are of great value as they ensure that relevant issues are taken into consideration. Attached at the end of this document is a registration form, kindly complete it and send it back to **Ms Zwivhuya Tshabuse** through given means of communication also attached there.

Notice is hereby given in terms of the Mineral and Petroleum Resources Development Act (MPRDA) (Act 28 of 2002) and EIA regulations 2014, published under Government Notice No. 982 in Gazette No. 3822 of 8 December 2014, amended on 7 April 2017, that **Vernex Holdings (Pty) Ltd** has an intention to mine coal on the aforementioned portion.

Be assured that your comments are of great value as they ensure that relevant issues are taken into consideration. **Attached at the end of this document is a registration form**, kindly complete it and send it back to

PROJECT DESCRIPTION

Mining Permit Application has been submitted for the extraction of **Coal** resource on the property mentioned above. The Mining Permit area, as seen in figure 1 and figure 2 is situated approximately 23,67 km West of Piet Retief along R543 towards Dirkiesdorp, which is located approximately 17.75 km south west of the project area.

Mining activities will be undertaken over a period of two (2) years. This project will entail an open cast method of excavation. The mine design will be developed according to the dimension of the applied mineral deposit within the project area, but overall mining activities will be limited to an area of 5 Ha as per mining permit requirements. The topsoil will be stockpiled elsewhere on site preferably next to the farm boundary and will be used during rehabilitation period. Once a box cut has been made, the overburden and mineral resources where necessary will be loosened by blasting. The loosened material will then be loaded onto trucks by excavators. A haul road will be situated at the side of the open cast, forming a ramp up which trucks can drive, carrying ore and waste rock. Waste rock will be piled up at the surface, near the edge of the open cast (waste dump). The waste dump will be tiered and stepped, to minimize degradation. All the activities will be guided by the project's EMPr such that the project does not impact the environment negatively.

REGULATORY FRAMEWORK

The EIA process through BAR & EMPR to be undertaken will be conducted in accordance with the National Environmental Management Act (Act 107 of 1998) and Environmental Impact Assessment regulations as amended (April 2017).

The activity is to extract the existence and occurrence of the applied mineral; therefore, this will be conducted in accordance with Mineral and Petroleum Resources Development Act, (Act 28 of 2002). Other regulatory guidelines to be followed include: National Water Act, 1998 (Act 36 of 1998), National Air Quality Standards (GN 1210: 2009) and National Dust Control Regulations (GN 827: 2013).

These all will accurately be followed to ensure that identified impacts are assessed and mitigated according to their significance so that the protection of the receiving environment and populations is met.

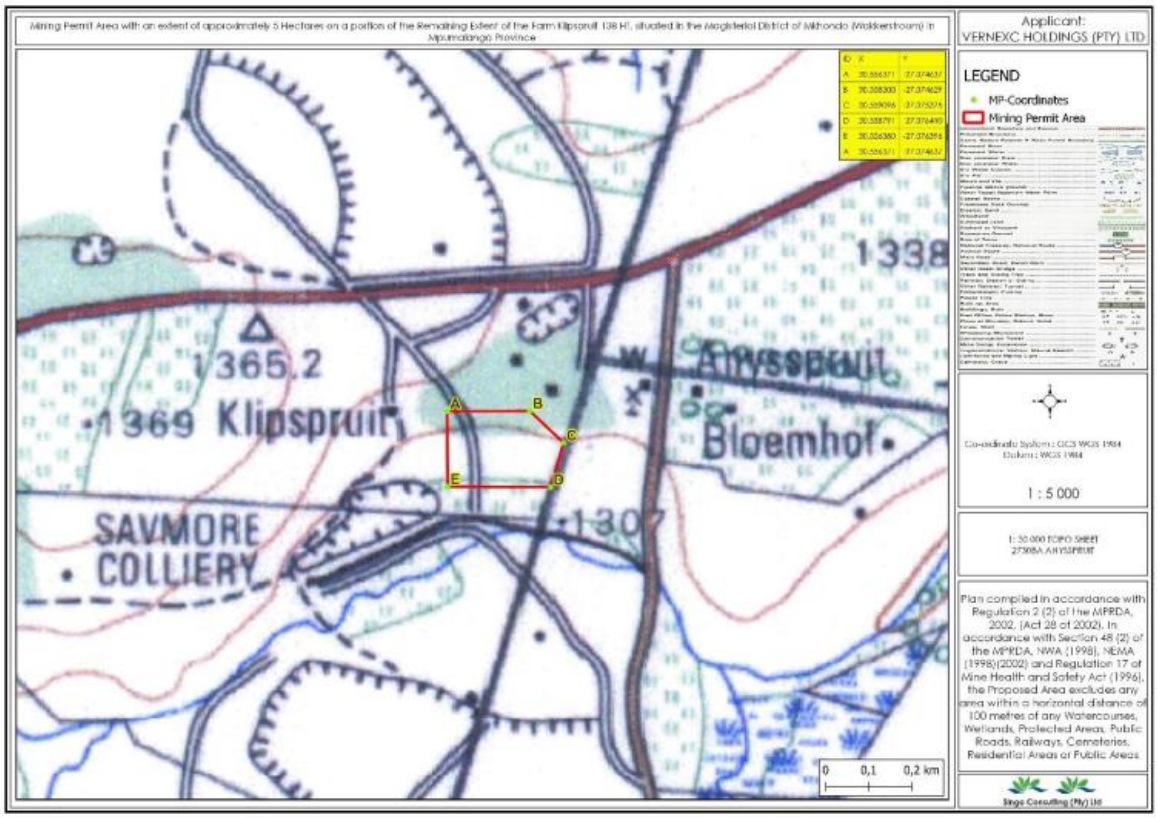


Figure 1: Regulation 2.2 map A (-27.074637, 30.556371)

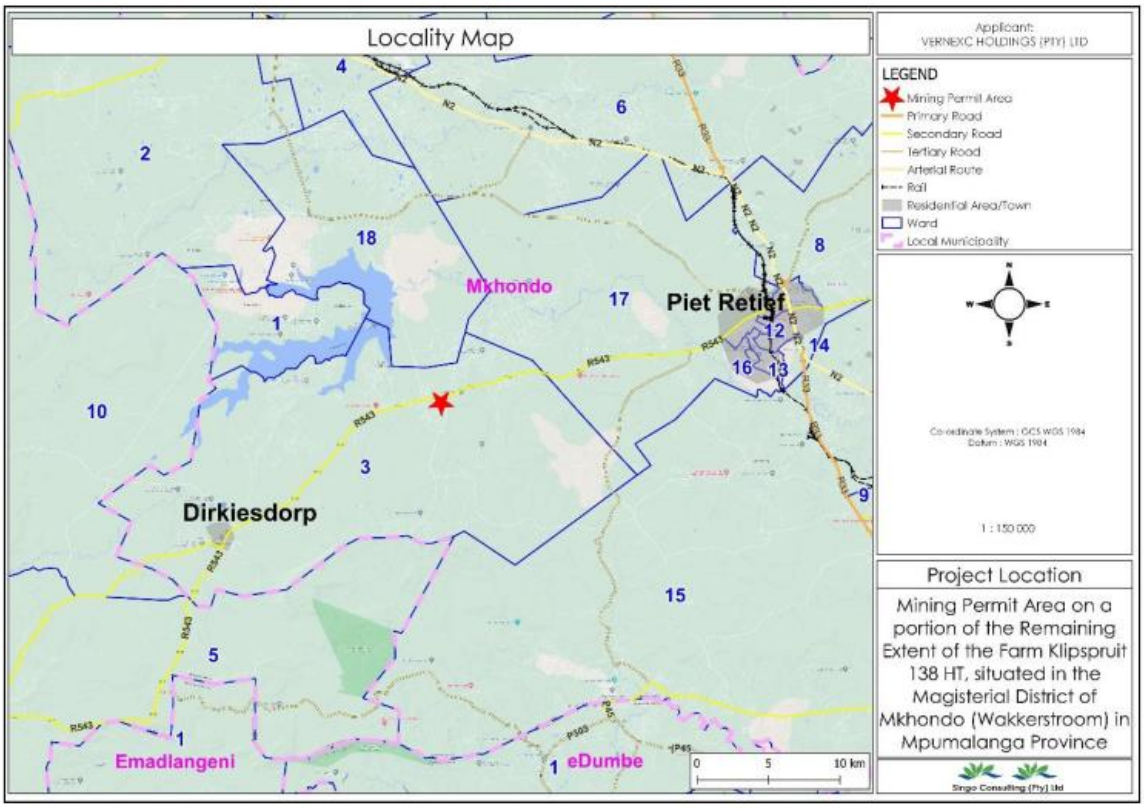


Figure 2: Locality Map

Singo Consulting (Pty) Ltd

Address: Office 870, 5 Balalaika Street,
Tasbet Park Ext 2, Witbank
1040
Tel: +27 13 692 0041
Cell: +27 67 904 7475
Email: zwivhuya@singoconsulting.co.za/
admin@singoconsulting.co.za

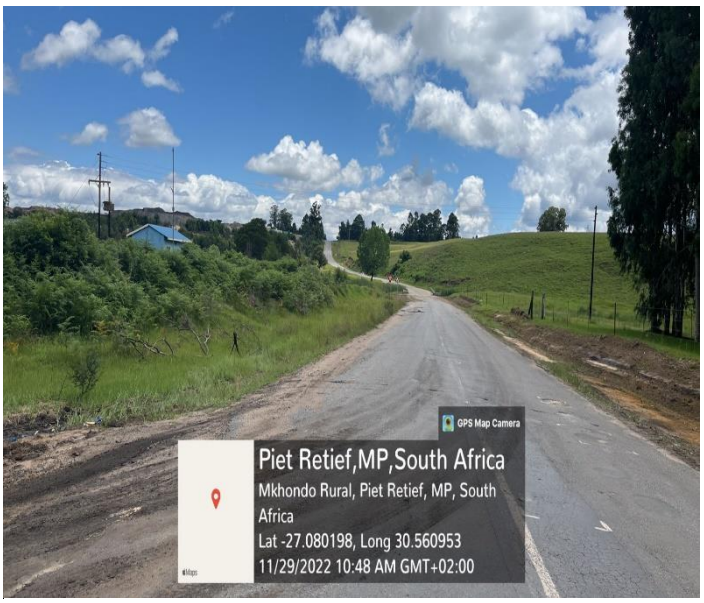
REGISTRATION & COMMENT SHEET-(MINING PERMIT REF MP 30/5/1/1/3/13020 MP)

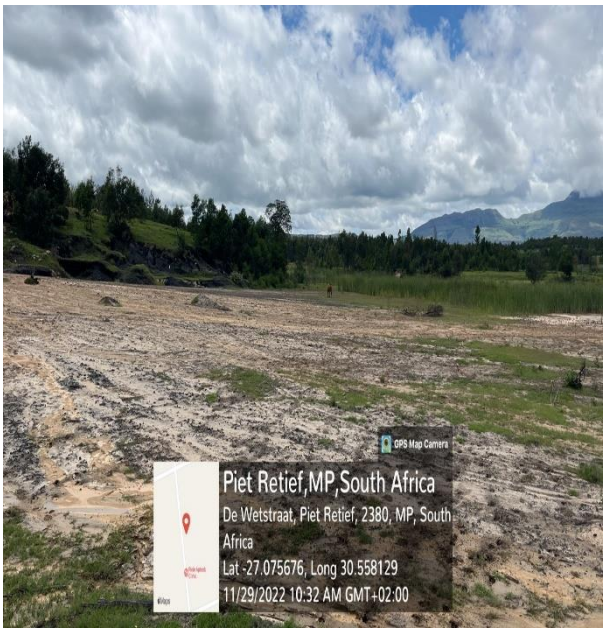
Title		Name		Surname	
Company					
Designation					
Address					
Tel No.			Fax No.		
E-mail			Cell No.		
I would like to receive my notifications be (mark with "X"):		Post		E-mail:	
				Fax:	

	Please indicate why you would have an interest in the above-mentioned project.
	Please provide your comments and questions here:
	Please feel free to attach a separate document

Please add any person you think may be interested and affected parties:				
Full name			Company	
Address				
E-mail			Contact No.	

Appendix 3: Site Pictures





Appendix 4: Screening Report

Appendix 5: Baseline Specialist Studies