



**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

# **BASIC ASSESSMENT REPORT And ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

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**GREATER EMALAHLENI  
YOUTH  
2016/007665/24**

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

The farm: portion 1 of the farm Kleinzuikerboschplaats 5 IS  
Area: Ogies  
Mining permit reference: MP 30/5/1/3/2/11740 MP  
Date: 04 May 2018

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

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

**It is therefore an instruction that** the prescribed reports required in respect of applications for an environmental authorization 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 Authorization being refused.

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

## 2. 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 proposed activity is located and how the 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 technology alternatives on the these aspects to determine:
  - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - (ii) the degree to which these impacts—
    - (aa) can be reversed;
    - (bb) may cause irreplaceable loss of resources; and
    - (cc) 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; and
  - (iii) identify residual risks that need to be managed and monitored.

## PART A

### SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

#### 3. Contact Person and correspondence address

##### a) Details of

##### i) Details of the EAP

**Name of the Practitioner:** Abraham Maphoso  
**Tel No.:** 013 656 0601  
**Fax No. :** 013 656 0601/086 527 9704  
**E-mail address:** [Abraham@ndlelenhle.co.za](mailto:Abraham@ndlelenhle.co.za)

##### ii) Expertise of the EAP.

##### (1) The qualifications of the EAP (with evidence).

<b>Institution</b>	:	<b>Technikon Northern Gauteng</b>
Duration Studied	:	2001-2003
Degree Studied	:	Environmental Management
Degree obtained	:	National Diploma
Main Subjects	:	Environmental Resources Environmental Chemistry Environmental Management
<b>Institution</b>	:	<b>Tshwane University of Technology</b>
Year	:	2005
Degree	:	B-Tech Environmental Sciences
Subjects	:	Environmental Resources Environmental Chemistry Environmental Management Environmental Social Science Environmental Research
<b>Institution</b>	:	<b>Wits University</b>
Year	:	2009
Subjects	:	Introduction to Mineral Resource Management Mine Financial Valuation and Optimization Massive Mining Methods Legal requirements

**(2) Summary of the EAP's past experience.**

(In carrying out the Environmental Impact Assessment Procedure)

<b>YEAR</b>	<b>EMPLOYER</b>	<b>JOB DESCRIPTION</b>
2003-2004	Mpumalanga Department of Agriculture and Land Administration	<b>Environmental Assistant</b> (In-service-Training) Determine and implement the appropriate measures on issues pertaining the environmental management(i.e. land management through rehabilitation of the excavations, construction of fire breaks, regulating the deforestation, and minimizing the causes and managing the erosion) Conduct public participation process (i.e. conducting the environmental awareness training around the school and ensuring that the public is in the possession of relevant information is so far as the environmental management is concern).
2006 - 2010	Department of Minerals and Energy (Gauteng Region)- GP Department of Minerals and Energy (Mpumalanga Region)	<b>Environmental Officer</b> (Interpretation of the environmental legislation to determine compliance and non-compliance of the prospecting and mining activities. Ensuring that proper applications are lodged as per the Regulation. Assessments of Environmental Management Plans (understand the baseline information, evaluate the impact of all the prospecting and mining activities on the environment, establish if the mitigation measures are justifiable and acceptable). Conduct site inspections of mines, assess and manage environmental degradation and control mine closure (i.e. verify the implementation of the mitigation measures mentioned within the approved Environmental Management Plan through observing the mining activities e.g. determine the dust levels and if the applicable measures are implemented)
2010 - 2011	Tshiano Mining and Consulting (Pty) Ltd	<b>Environmental Specialist</b> (Compile Environmental Technical Reports(i.e. obtain specialist studies such as ground water study, surface water study and determine the possible mitigation measure on the environment), Social and Labour Plan, Conduct Environmental Audit at the Mines(verify the level of compliance to the approved Environmental Technical Documents thought checking the levels of dust, water, noise pollution by collecting samples). liaise with Government Department regarding Environmental Authorizations and compliances)
2011	BHP Billiton Energy Coal of S.A	<b>Environmental Specialist</b> (Ensure compliance with all relevant legislation. Determine the level compliance in so far as the requirements are stipulated within the operation and ensures that appropriate mitigation measures are implemented. Conduct environmental awareness within the operation through safety meeting and induction to avoid the degradation of the environment by contractor and employees. Conduct the audit to determine the environmental gaps. Provide guidance to the subordinates and the mine official on dealing with all environmental concern/issues. Ensures that waste management procedure is implemented even to the landfill site. Ensures that all the environmental liability is accounted for and the correct amount is provide to the Department by the financial section.
2012-2015	Southern Cross Coal (Pty) Ltd	<b>Environmental Manager</b> (Ensure compliance with all environmental regulation in so far as the required licenses are concern (i.e. water use license, environmental authorization and waste license). Derive the strategies to junior subordinate to ensure compliance with all the legal aspects. Obtain and interpret the monitoring results and ensures that appropriate measures are implemented. Evaluate and facilitate environmental authorization applications. Provide guidance to the mining planning department regarding environmental authorization required prior mining.)
2015-date	Ndlelenhle Mining and Consulting	(Ensure compliance with all relevant legislation. Determine the level compliance in so far as the requirements are stipulated within the operation and ensures that appropriate mitigation measures are implemented. Conduct environmental awareness within the operation through safety meeting and induction to avoid the degradation of the environment by contractor and employees. Conduct the audit to determine the environmental gaps.

**b) Location of the overall Activity.**

<b>Farm Name:</b>	Kleinzuikerboschplaats 5 IS (Portion of portion 1)
<b>Application area (Ha)</b>	5.0000 hectares
<b>Magisterial district:</b>	Witbank (Ogies)
<b>Distance and direction from nearest town</b>	The study area is limited in the north by the ogies residential area, in the east by dump of mining material, it is in close proximity to collieries. The northern boundaries of the study area are located $\pm$ 450m away from the location of residential area
<b>21 digit Surveyor General Code for each farm portion</b>	TOIS000000000000500001

### c) Locality map

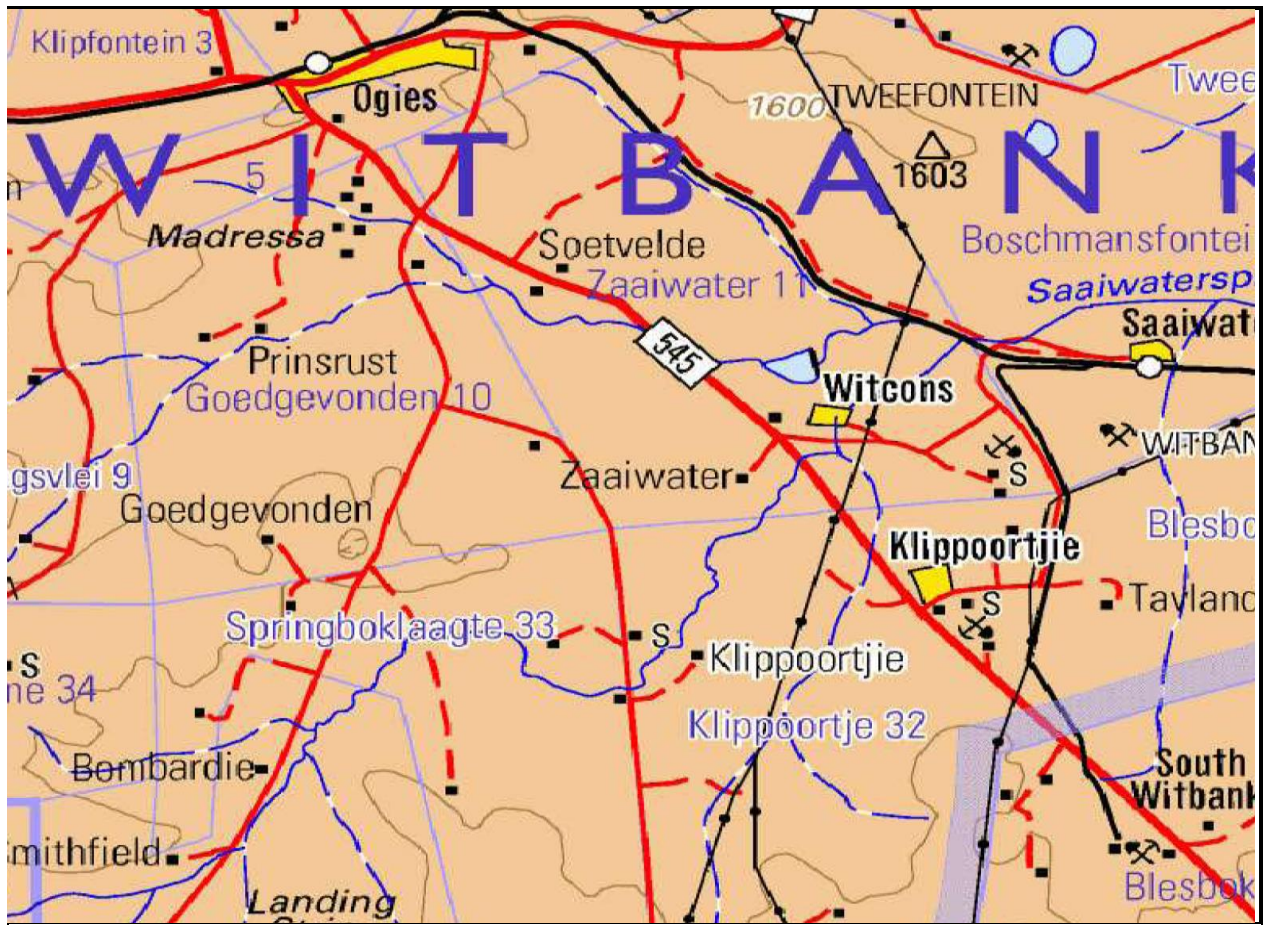


Figure 1: Locality Map

The study area is limited in the north by the ogies residential area, in the east by dump of mining material, it is in close proximity to graves and collieries. The northern boundaries of the study area are located  $\pm 450\text{m}$  away from the location of residential area

In light of the above, the proposed mining operation is an ideal to the current land and the community at large, because the overall ration of the place is being disturbed by mining and land uses



In light of the above, the proposed mining operation is an ideal to the current land and the community at large.

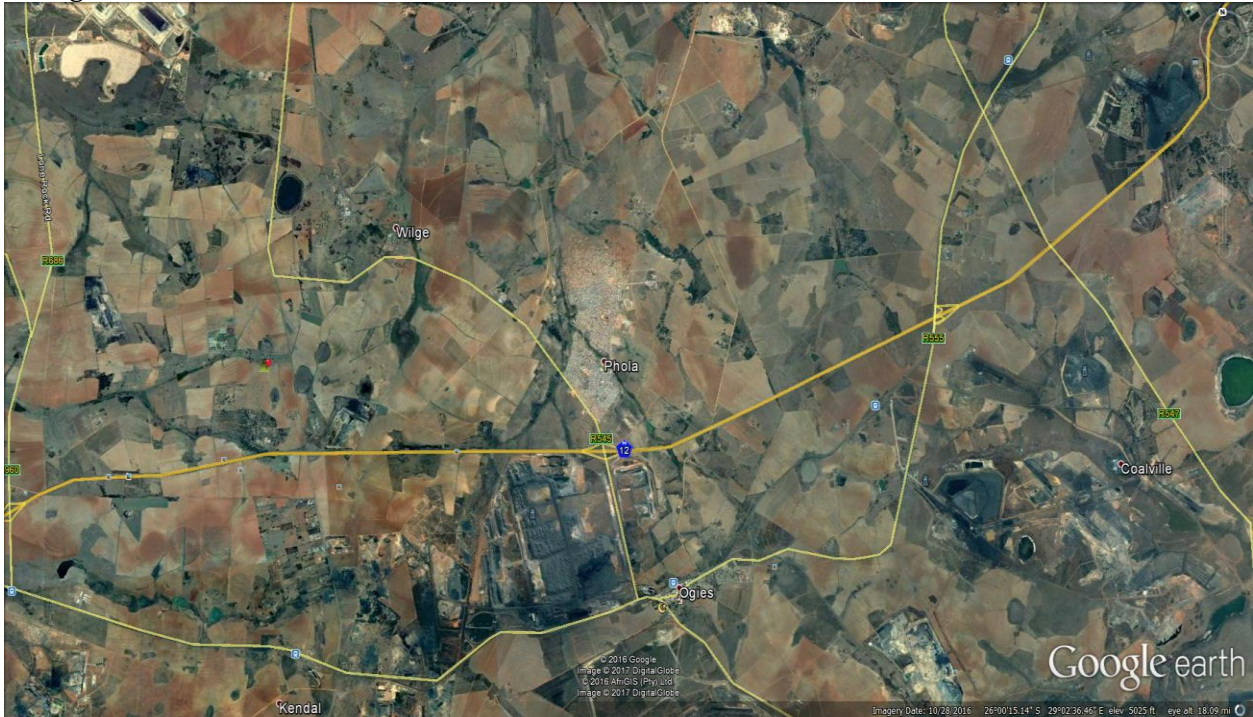


Figure2: Google earth view Plan

The figures 2 illustrate the current land uses of the proposed mining operation. It also indicates the residential areas which are located in the vicinity of the proposed mining area.



Figure3: local setting within municipal border



The study area is limited in the north by the ogies residential area, in the east by dump of mining material, it is in close proximity to collieries. The northern boundaries of the study area are located  $\pm 450\text{m}$  away from the location of residential area, under the jurisdiction of the Emalahleni Local Municipality, located within the Nkangala District Municipality.

**d) Description of the scope of the proposed overall activity.**

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

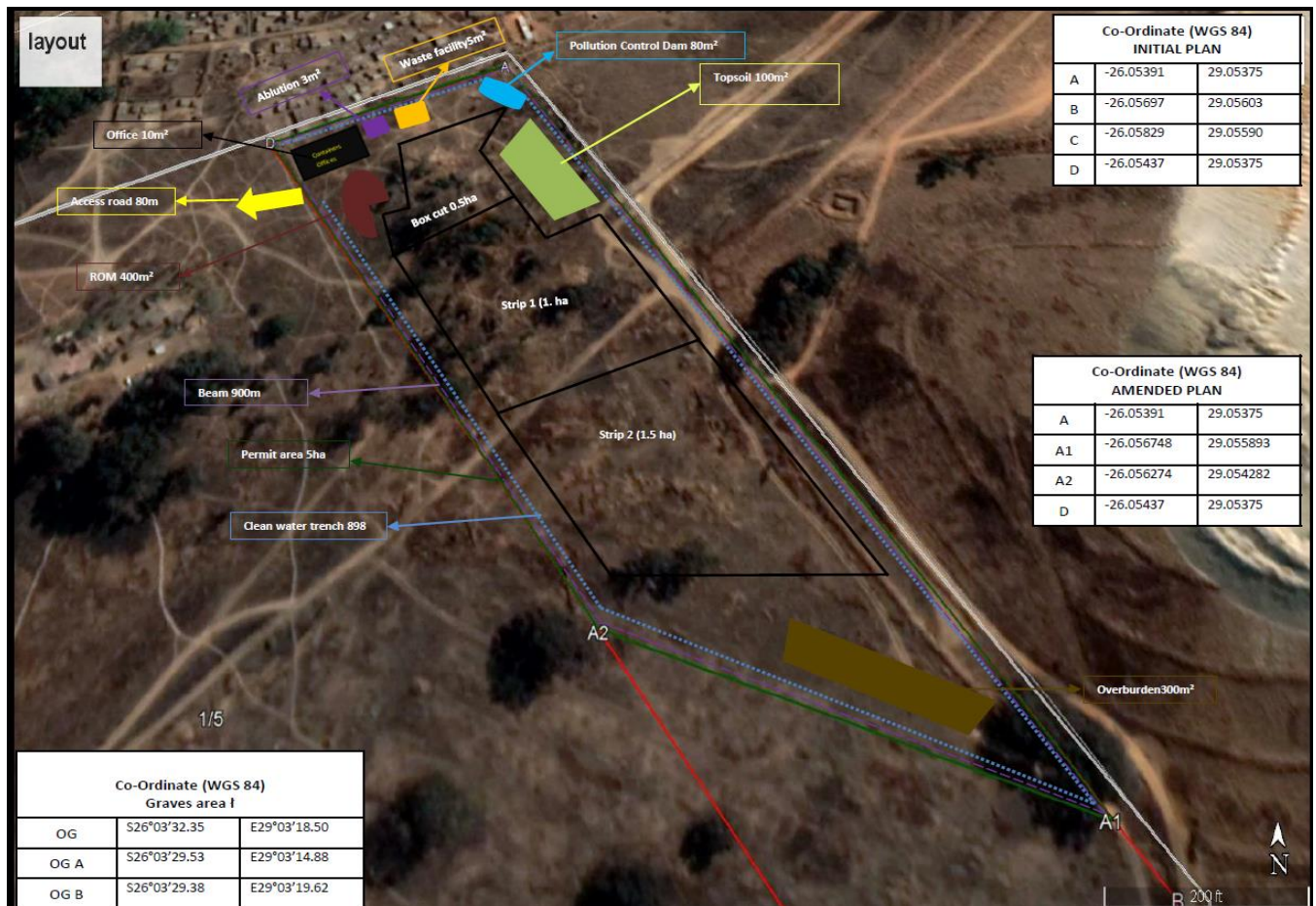


Figure 4: Mining Layout Plan

A coal mining operation can be viewed as being made up of some, or all, of the following sub-activities:

- Construction of Access road
- Establish mobile office and security dwellings
- Establish mobile ablution facility
- Construction of clean water trench
- Construction of dirty water trench
- Construction of pollution control dam
- Construction of Berms

- Establish mobile screening
- Clearance of vegetation
- Mining area (including strip 1, 2 & 3)
- Temporary stockpiling of material (Topsoil stockpile, overburden and ROM)
- Loading and hauling to the stockpile area and
- Rehabilitation

<b>Phase</b>	<b>Activity</b>	<b>Expertise Required</b>	<b>Duration</b>
Construction	Logistical consultation with land owner. Construction of Access road Establish mobile office and security dwellings Establish mobile ablution facility Construction of clean water trench Construction of dirty water trench Construction of pollution control dam Establish mobile screening Construction of berm	Project Manager Contractor	2 Months
Operational	Clearance of vegetation Mining area (including strip 1, 2 & 3) Temporary stockpiling of material (Topsoil stockpile, overburden and ROM) Loading and hauling to the stockpile area and Rehabilitation	Project Manager Surveyor	20 months
Decommissioning and closure	Removal of mine infrastructure Rehabilitation of excavations and disturbed land Re-vegetation of land Closure report and application for closure certificate	Contractor Environmental	2 Months
Post closure monitoring	Monitor rehabilitation sustainability and liaising with land owner on matters requiring action.	Project manager	2 years

**(i) Listed and specified activities**

LISTED ACTIVITIES		
Number and date of the relevant notice:	Activity No:	Describe each listed activity as per project description:
No. R.983 04 December 2014	21	Any activity including the operation of that activity which requires a mining permit in terms of Section 27 of the Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002)
No. R.983 04 December 2014	27	The clearance of an area of 1 hectars 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

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY Ha or m <sup>2</sup>	LISTED ACTIVITY  (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE  (GNR 544, GNR 545 or GNR 546)	WASTE MANAGEMENT AUTHORISATION  (Indicate whether an authorization is required in terms of the Waste Management Act).
Access Roads	300m	Listing 1 Activity 21	No. R 983 of 2014	N/A
Mobile office and Security Dwellings	36m <sup>2</sup>	Listing 1	No. R 983 of 2014	N/A
Mobile ablution facility	4m <sup>2</sup>	Activity 21	No. R 983 of 2014	N/A
Clean water trench	890m	Listing 1	No. R 983 of 2014	N/A
Dirty water trench	880m	Activity 21	No. R 983 of 2014	N/A
Pollution control Dam	340m <sup>2</sup>	Listing 1	No. R 983 of 2014	N/A
Waste facility (domestic)	15m <sup>2</sup>	Activity 21	No. R 983 of 2014	N/A
Construction of berm	900m	<b>Listing 1</b>	<b>No. R 983 of 2014</b>	<b>N/A</b>
Mobile screening	150m <sup>2</sup>	Listing 1	No. R 983 of 2014	N/A
Clearance of vegetation	4.5ha	Activity 27	No. R 983 of 2014 Activity 27 Listing 1	N/A
Mining area Strip Ratio Roll over Method Strip	4.5ha in total	Listing 1	No. R 983 of 2014	N/A
Strip 3	1ha	Activity 21	No. R 983 of 2014	N/A
Strip 2	1ha	Listing 1	No. R 983 of 2014	N/A
Strip 1	1ha			
Box cut	0.5ha			
Temporary stockpiling of material (top soil, overburden	900m <sup>2</sup>	Activity 21	No. R 983 of 2014	N/A
ROM	1120m <sup>2</sup>	Listing 1	No. R 983 of 2014	N/A
Loading and Hauling of material	830m <sup>2</sup>	Listing 1	No. R 983 of 2014	N/A
Rehabilitation	-	Activity 21	No. R 983 of 2014	N/A
	4ha	Listing 1	No. R 983 of 2014	N/A

## **(ii) Description of the activities to be undertaken**

(Describe Methodology or technology to be employed, including the type of commodity to be prospected/mined and for a linear activity, a description of the route of the activity)

### **Coal Mining**

The Coal mine has been planned to produce 150 000t Sales of Bituminous coal over a 10 months period by opencast means. Each production pit has been designed and equipped to produce an average of 20 000 tons, depending on the overburden thickness being mined and the number of working shifts per month, which will meet the overall average monthly production requirement of 15, 000 tones ROM. The overburden is planned to be moved by truck and shovel to the designated area.

The operation is planned on 8hr shifts per day. Maintenance of equipment will be done based on the planned maintenance schedules.

### **COAL MARKET**

Given the size of the reserve, it would not be economically viable to establish a beneficiation plant on site only mobile plant will be utilized. The coal will be selectively mined, as a raw Run of Mine product and delivered to a stockpile on site, from where it will be loaded onto road transport and transported to the purchaser, or their processing facility.

Product:	Run of Mine Coal.
Quantity:	15 000 tons
Proposed market:	Local

### **Mining Method**

A coal mining operation can be viewed as being made up of some, or all, of the following sub-activities:

- Construction of Access road
- Establish mobile office and security dwellings
- Establish mobile ablution facility
- Construction of clean water trench
- Construction of dirty water trench
- Construction of pollution control dam
- Establish mobile screening
- Waste facility
- Clearance of vegetation
- Mining area (including strip 1, 2 & 3)
- Temporary stockpiling of material (Topsoil stockpile, overburden and ROM)
- Loading and hauling to the stockpile area and
- Rehabilitation

Rehabilitation of the mine has become an important consideration for government bodies, the general public and mining companies. The development of detail environmental legislation has

largely reflected public and in turn government concern that mined sites retain at least a pre mining land capability and that environmental degradation be repaired. Mine design and scheduling assists in determining every activity associated with the proposed project. In that, it is critical to understand the setup of the mining activities to ensure that concurrent rehabilitation is practical and possible.

#### Site Clearing – Topsoil, subsoil and overburden.(2 months)

Concurrent rehabilitation commences with handling the topsoil, subsoil and overburden material within the proposed area. Handling of soil material plays a critical role when conducting concurrent rehabilitation. In that, the quantity of the soil material must be known as well as the area required for storage. This is a key factor in handling the soil material since mining contractor will be shown the location appropriate for storage and possible quantities expected. According to the survey conducted on the proposed area an area will be required to accommodate topsoil and overburden(refer to mining layout). The management of soil material during mining is important to ensure that the chemical and physical properties are maintained.

#### Initial boxcut(3-5 months)

The proposed mining operation will commence on the southern side of the property. Topsoil, subsoil and overburden will be placed adjacent to the boxcut as illustrated on the mining layout. Three cuts will be required as well as the sequential of replacing the soil material. The proposed mining operation will follow the same route depicted in this document to ensure proper concurrent rehabilitation.

#### Operational Phase(6-8 months)

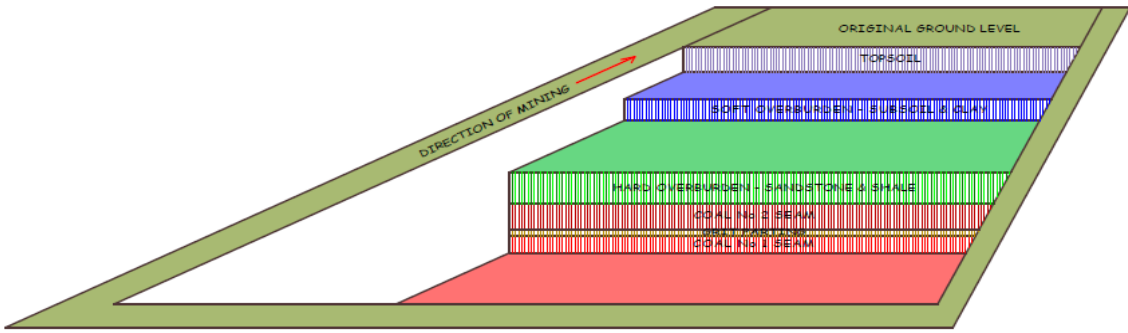
Following the initial boxcut, no overburden and/or any soil material will be sent for storage on the mining area. Hard overburden – sandstone will be placed at the bottom of the initial boxcut and grit parting will then follow.

#### Final void(4-7 months)

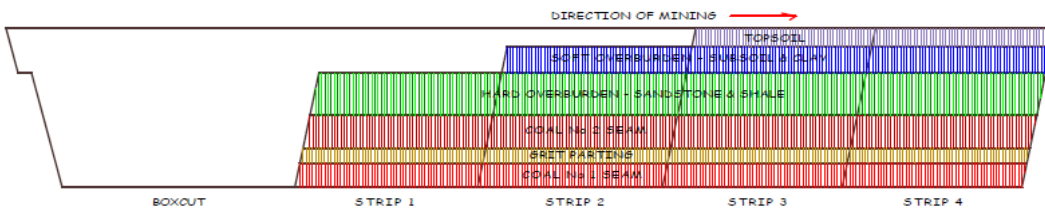
The overburden stockpile which was stored when developing the initial boxcut will be utilised to backfill the final void. The material will be loaded into the trucks and discharged into the pit. The final void is the only risk in terms of environmental liability to the Department of Mineral Resources. On the completion of filling the void, the surface(i.e. overburden and R.O.M stockpile areas) will be scrapped of any coal material and commence with revegetation. During this phase all infrastructure on site will be removed and every surface cleaned.



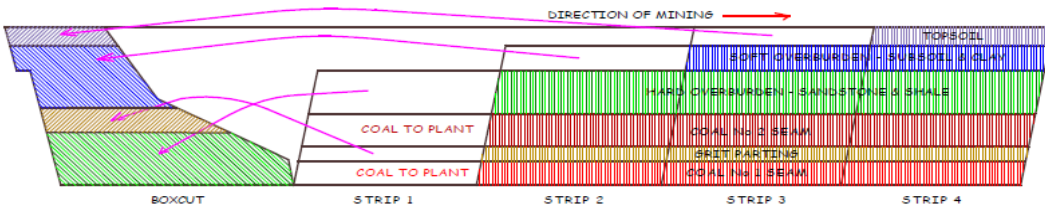
SCHMATIC VIEW OF MINING AND CONCURRENT REHABILITATION SEQUENCE



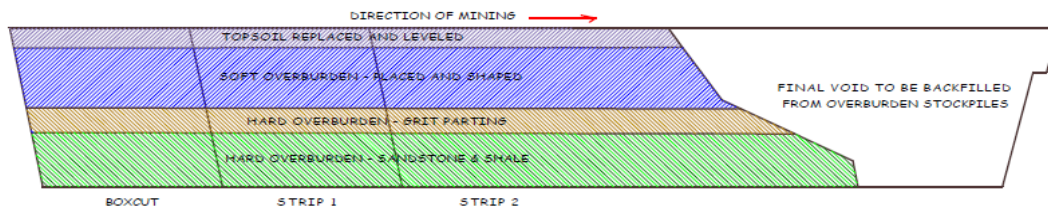
3-D VIEW OF PIT AFTER COMPLETING BOXCUT



LONG SECTION THRU PIT AFTER COMPLETING BOXCUT



LONG SECTION THRU PIT AFTER MINING STRIP 1



LONG SECTION THRU CONCURRENT REHABILITATION AND FINAL VOID

Figure 5: Con-current rehabilitation

## **TIME FRAMES**

Time frames are divided into a compliance period, an operational period and a rehabilitation/closure period. The proposed boxcut area is therefore considered part of the construction phase and work in progress.

### **Compliance Period**

The compliance time frame is as regulated by the timeframes as set out in the Mineral and Petroleum Resources Development Act and will not be expanded on in terms of the Mine and Works Plan.

### **Operational Period**

The actual operational time frame is calculated from the date of granting of a mining permit the operational period has been subdivided into a construction and implementation phase and a production phase.

### **Construction Phase**

The construction Phase will commence immediately upon granting of a mining permit and will include the following items and expected timeframes:

- Preparation of Access Road – 1 Week.
- Construction of mobile Security (Security house) – 1 Weeks
- Construction of mobile ablutions. 1 day
- Mobile screening 1 week
- Construction of mine haul roads. 1 week
- Construction of Clean and Dirty trenches and pollution control facilities. 3 weeks
- Construction of berms 4-weeks
- Construction of Boxcut.

### **Operational Phase**

The operational phase will commence after the completion of the boxcut, known as steady-state mining. A conventional strip mining [roll-over] method will be employed. Material from the boxcut phase will be stored per overburden classification, with the bulk of the material placed in a position alongside the final strip, to facilitate filling of the final void.

Steady-state mining includes the following processes and will be conducted by the mining contractor appointed by Greater Emalahleni Youth .

**Rehabilitation:** Rehabilitation of the opencast mining area will be done concurrently with the opencast mining according to a stated mining sequence. Materials will be placed back into the void in the former strata graphical sequence i.e. topsoil on the surface, subsoil directly below the topsoil and all hard material [sandstone and shale] in the bottom of the void. It is envisaged that the final reinstated surface level will be approximately 0.41m above the original surface level. However the existing surface drainage pattern will remain unchanged and the total disturbed area will be free draining. On completion of surface reinstatement, the area will be re-vegetated with suitable pasture grass species. To conduct the above-mentioned process the planned mining equipment to be utilized is as follows –

- 1 X Komatsu D55 Bulldozer
- 2 X Volvo 460 Hydraulic Excavators
- 6 X Volvo A30 Articulated 6X6 Dump trucks
- 1 X Komatsu D65 Bulldozer
- 1 X Volvo 72 Motor Grader
- 1 X 12 000 litre Water Bowser
- 1 X mobile screening

**e) 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
<b>Specific Environmental Management Acts (SEMAs)</b>		
National Environmental Management: Biodiversity Act, 2004	Presence of trees	The EMP will regulate the applicant to apply for Tree Removal Permit from the NCDENC prior to the potential removal of any sensitive and/or protected species.
National Heritage Resources Act, 1999	The activity will trigger the requirements under Section 38 of the NHRA. However, the requirements for permits are not yet known.	
<b>National Legislation</b>		
National Environmental Management Act, 1998	This Basic Assessment Report & EMP	An Application for Environmental Authorization was submitted to the DMR. The application was accepted by the DMR (MP30/5/1/3/2/11740 MP). The DMR requested the submission of the Basic Assessment Report and EMP within 90 days of the letter.
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 Water Act, 1998	Groundwater abstraction as part of drilling activities	In terms of Government Notices Regulation 399, the applicant will be allowed to abstract 75m <sup>3</sup> of groundwater per hectare per annum from groundwater within the Quaternary Catchment of B20G. This use will be Generally Authorized.  Clarification is required from the DWS whether a Section 21 (c) & (i) Water Use License will be required.
Mineral and Petroleum Resources Development Act, 2002	Application for mining permit in terms of Section 27	A Mining Permit Application has been submitted to the DMR by the Applicant. The application was accepted by the DMR (MP30/5/1/2/11740MP).
<b>Municipal Plans</b>		
Integrated Development Plan (IDP)	Land Claims	One of the key issues identified by the IDP is the need to facilitate the land

<b>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</b>	<b>REFERENCE WHERE APPLIED</b>	<b>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT</b>
Strategic Development Framework (SDF)	Alternatives	<p>In terms with the SDF of the (Nkangala and Emalahleni) municipality, various strategies and associated policies should be adopted to ensure effective spatial development.</p> <p>In terms of Section 5.1 of the SDF the municipality must provide alternative means of support for rural/informal population in order to decrease dependence on the environment and subsistence agriculture. For this purpose the following policies are adopted:</p> <ul style="list-style-type: none"> <li>Maximize economic benefit from mining industrial, business, agricultural and tourism development within the area</li> <li>Promote a climate for economic development. Improve public and investor confidence in the region through crime reduction and infrastructure development.</li> </ul>

#### **f) Need and desirability of the proposed activities.**

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

Generally, a massive coal reserve is required and needed. The proposed permit coal reserve is located directly to the east of Kusile, between the N4 highway in the north and N12 highway in the south, with a small portion of the coal reserve found in terms of scale and tonnage required it is the opinion of the Environmental Assessment Practitioner that there is no alternative coal mine, or combination of smaller coal mine that could supply this coal on schedule and at the correct grade, quality and quantities-with less environmental impacts than those associated with the coal mining.

#### **EMPLOYMENT OPPORTUNITIES:**

Emalahleni economy is one of the biggest economic areas and it is therefore expected that a significant number of employment opportunities are being provided in the area. Mining, trade and manufacturing are the major leading employment drivers in Emalahleni LM. Mining in Witbank coal field (Nkangala) is the highest contributor to both economic growth and job creation. As mentioned, the Municipality is host to a number of large industries and a number of national mining companies, such as Xstrata and PHB Billiton. Given the abundance of coal reserves in Mpumalanga Province (and being the key mineral within Nkangala) the local space is likely to benefit from the resources abundantly found within the locality.

However, coal mining and related electricity generation within the municipal area pose serious challenges around environmental degradation, infrastructure maintenance, and agriculture. Coal produced is used locally within Witbank & Middelburg but also exported. Eskom is the largest local buyer while China is the major export buyer. Demand for coal is generally very high for both market segments. Selling prices are generally regarded as stable both currently and in the foreseeable future. The maintenance of the road and rail freight infrastructure linking to other parts of Mpumalanga and to Richards Bay is one of the biggest challenges faced by mining houses within Nkangala.

#### **Agricultural Sector**

The agricultural land in Nkangala is considered to have high production value and potential. The agricultural activities are capable of supporting rural development; particularly through emerging farmer support programmes.

#### **Tourism and Hospitality Services**

Business tourism is identified as the key contributor to the performance of the hospitality services sector within Nkangala. Key clients were identified and categorized as employees from both national and provincial government, mines, as well as executives visiting the various mining houses and other



businesses across the municipal area. An additional target market includes friends and relatives visiting, together with travellers in transit either to the Lowveld, Maputo or Gauteng.

Key product offerings include bed and breakfast services, full hotel accommodation services; and meals and entertainment. Businesses within the sector contend that since late 2008, business has been fluctuating due to the recession. To survive in the market, businesses resort to cutting prices or offering massive discounts in order to attract clients. This phenomenon cuts across different hotel and bed & breakfast sizes and is likely to continue in the foreseeable future if the overall business environment does not improve dramatically.

Emalahleni Municipality has about 36% of unemployed young people with majority possessing some qualification. Mining activities will assist in reducing the amount of unemployed drastically and achieve some social needs.

<b>EMPLOYMENT STATISTICS</b>	
Total population	395,466
Young (0-14)	25,2%
Working Age (15-64)	71,2%
Elderly (65+)	3,6%
Dependency ratio	40,4
Sex ratio	111,8
Growth rate	3,58% (2001-2011)
Population density	148 persons/km <sup>2</sup>
Unemployment rate	27,3%
Youth unemployment rate	36%
No schooling aged 20+	5,8%
Higher education aged 20+	13,9%
Matric aged 20+	31,4%
Number of households	119,874
Number of Agricultural households	10,947
Average household size	3,2
Female headed households	27,9%
Formal dwellings	77,2%
Housing owned/paying off	45,3%
Flush toilet connected to sewerage	68,8%
Weekly refuse removal	67,2%
Piped water inside dwelling	54,9%
Electricity for lighting	73,4%

## **ENVIRONMENTAL BENEFITS:**

The socio-economic status of the area where mining will take place requires such establishment for mining, which will in turn contribute to the local economy through creation of job opportunities. The area is close by Ogies Town and the adjacent road is R545. Mining on the proposed area will assist in the followings:

- Eliminate the illegal mining operation
- Rehabilitation of the land for development purposes including agriculture
- Removal of invader species.

### **g) Motivation for the overall preferred site, activities and technology alternative.**

The proposed mining area is targeted, currently there are mining activities taking place on the surrounding

The mining method which is safe and environmental friendly is opencast mining method with the strip mining type which encourages the con-current rehabilitation of the site. Only technological assessment can be made due to the fact that preferred site is determined by the availability of the mineral of interest.

### **h) Full description of the process followed to reach the proposed preferred alternatives within the site.**

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

#### **i) Details of the development footprint alternatives considered.**

The location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;

Due to the size of the mining area; some of the activities to be undertaken will rotate with the mining direction. In that, only the clean water and dirty water trenches are permanently placed around the mining operation including the pollution control dam. Other activities will such as mobile offices, mobile security houses, mobile ablation and mobile screening machinery will definitely rotate with the operation.

The mining direction has been dictated by the depth of the coal. In that, the mining operation will commence on the shallow side and continue through con-current rehabilitation (strip mining) in order to ensure that all the coal deposit is mined out.

(b) The type of activity to be undertaken;

- Construction of Access road

- Establish mobile office and security dwellings
- Establish mobile ablution facility
- Construction of clean water trench
- Construction of dirty water trench
- Construction of pollution control dam
- Construction of berm
- Establish mobile screening
- Waste facility
- Clearance of vegetation
- Mining area (including strip 1, 2 & 3)
- Temporary stockpiling of material (Topsoil stockpile, overburden and ROM)
- Loading and hauling to the stockpile area and
- Rehabilitation

(b) The design or layout of the activity;

The layout plan outlined clearly the different activities which will be conducted within the mining area.

- Construction of roads
- Temporary mobile offices
- Stockpiles area
- Pit mining area
- Construction of berm

(d) The technology to be used in the activity;

Open cast mining method is the best applicable method through strip mining type in order to allow the con-current rehabilitation to be implemented.

(e) The operational aspects of the activity; and

Stockpile  
 Electricity (Diesel Generator)  
 Roads (Mine and Provincial)  
 1X Komatsu D155 Bulldozer  
 1 X Volvo 460 Hydraulic Excavators  
 2 X Volvo A30 Articulated 6X6 Dump truck  
 1 X Mobile screening machinery  
 1 X Frond end loader 966 CAT

(f) The option of not implementing the activity.

The coal mine can never take place. The option of not approving the activities will result in not creating job opportunities

## **ii) Details of the Public Participation Process Followed**

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the

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

Identification of the interested and affected parties:

- Identify the Municipal
- Identify the Government Departments
- Identify the different landowners

Develop the I&AP Database

- Contact details
- Email address
- Postal address
- Fax
- Telephone

Develop Background Information Document

- Provide the process for the environmental authorization
- Provide the process for the prospecting right application
- Provide full description of the property, area, proposed activities, impacts and mitigation
- Include the Regulation plan 2.2
- Include the locality plan

Distribution of the information to the interested and affected parties

- Distribute the site notices
- Advertise on the local newspaper
- Email distribution
- Fax all I&AP

Obtain the respond, issues and concern from I&AP

- Capture the issues
- Provide mitigation measures
- Communicate the mitigation measures to the I&AP
- Forward the Public Participation Report to the Department

Information to be provided to Interested and affected parties

- The site plan.
- List of activities to be authorized
- Scale and extent of activities to be authorized
- Typical impacts of activities to be authorized ( e.g.surface disturbance, dust, noise, drainage, fly rock etc.)
- The duration of the activity.
- Sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land)

**iii) Summary of issues raised by I&As**

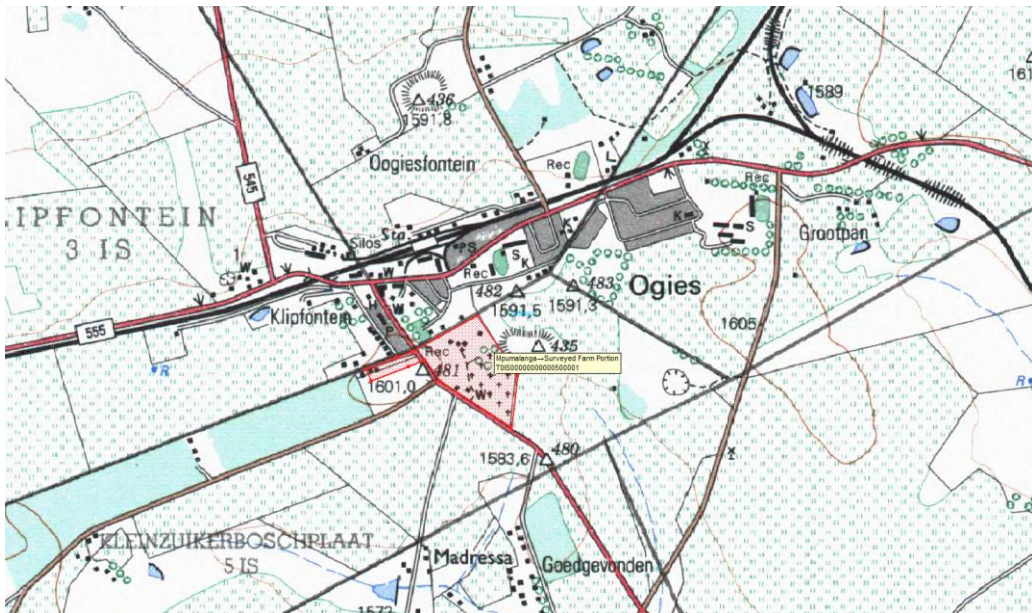
(Complete the table summarising comments and issues raised, and reaction to those responses)

Landowners/Interested and affected parties (I&AP)	Date	How did consultation take place?	Issues/ comments / concerns	Responses
Portion 1 is owned by SAIMIR Prop Inv cc	12/05/2018	Email and fax Site visit A3 site notices Newspaper advertisement	The landowner is positive about mining permit. Rehabilitation to be done and regulation upheld Air pollution Soil pollution The area around mining permit is out	Noted
Community and interested and affected parties	12/05/2018	Witbank news advertisement	No comments	No comments
State Departments		Emails		

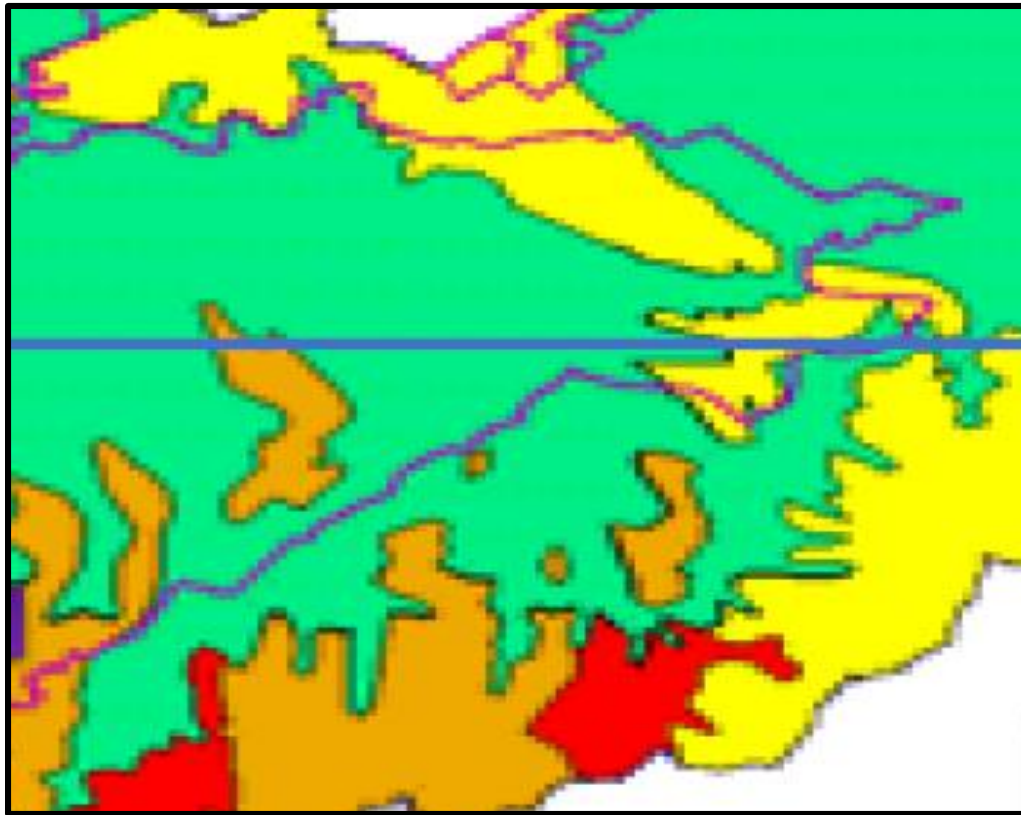
**iv) The Environmental attributes associated with the alternatives.**(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

**(1) Baseline Environment**

**(a) Type of environment affected by the proposed activity.**

Environment likely to be affected	Description of the Environment and surrounding area.
<p>Locality map</p>	<p><b>Status</b></p>  <p><b>Figure 6: locality area</b></p> <p>The proposed mining activities will highly improve the environmental status of the area applied for as well as adding the value to the property. This is due to the fact that after rehabilitated the area, proper development can be done which will benefit the community at the surrounding areas.</p>
<p>Vegetation</p>	<p>1.2 The specific environmental features on the site applied for which may require protection, remediation, manage or avoidance.</p>






**Figure 7: regional vegetation map**

**Status**

Currently most parts of the project area comprises mostly of grasslands, slightly to moderate undulating plains, including some low hill and pan depressions. The vegetation is short and dense grassland dominated by the usual Highveld grass composition (*Aristida*, *Digitaria*, *Eragrotis*, *Themeda*, *Tristachya* etc) with small, scattered rocky outcrops with wiry, sour grasses and some woody species, (*Acacia*, *Cafra*, *Celtis*, *Africana*, *Diospyros*, *lycioides*, subsp *lycioides*, *Parinari*, *capensis*, *Preotea caffra*, *P.welwitschii* and *Rhus magalismsontanum*) (L. Mucina and M. Rutherford)

The Witbank coalfield is situated mainly within the grassland biome, with some patches of savannah in the north. According to Daemane (2010) grasslands are amongst the most threatened and least conserved (only 1.3%) vegetation biomes in South Africa. Grasslands have high species richness and a high turnover of biodiversity across the landscape. The South African grasslands are very old, complex and slowly-evolved systems with indigenous species diversity that is second only to the well-known fynbos biome. The grasslands also play critical major river systems all originating in the impression that the biome consists only of grass species. In fact, only one in six plant species in the biome is a grass.

	<p><b>Action</b> Construction of access roads and water management structure such as trenches and berms are likely to cause vegetation disturbance.</p> <p><b>Mitigation measures.</b> Removed topsoil must be placed on the stockpile area. The topsoil stockpile will not exceed the height of 3m, and that the soil will be used as soon as possible. Replacement of the topsoil will be conducted in accordance with the soil horizons of the area applied for.</p>
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Animal Species	 <p>Figure 8: Animal habitat</p> <p><b>Status</b> The only protected area within the Olifants catchment is the Loskop Dam Nature Reserve, it is regarded as one of protected areas of South Africa, and it is located 91 km north east of the study area (Scientific Services, South African Parks, 2003).</p> <p><b>Flora</b></p> <p>Phoenicopterus ruber, Alcedo semitorquata, Anthopoides paradiseus, paradiseus, Anthus chloris, Botaurus stellaris Bugeranus, carunculatus, Ciconia nigra, Circus ranivorus, Falco naumanni, Falco peregrinus, Barbus serra, Calidus, Labeoba, rbus capensis, Galaxias zebratus, Austroglanis barnardi, Austroglanis gilli, Barbus erubescens, Pseudobarbus phlegethon, Barbus anoplus, and Labeo seeberi.</p> <p><b>Mammals:</b></p> <p>Aonyx capensis, Atelerix frontalis, Chrysospalax, villosus, Crocidura, mariquensis, Dasymys incomtus, Felis nigripes, Hyaena brunnea, Lutra maculicollis, Mellivora capensis, Mystromys, Orycteropus afer, Ourebia ourebei, Proteles cristatus, Rhabdomys pumilio and albicaudata</p> <p><b>Reptiles:</b></p>
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Acontias gracilicauda, Cordylus giganteus, Homoroselaps dorsalis, Pelomedusa subrufa and Tetradactylus breyeri,

**Amphibians:**

Pyxicephalus a. detersus

**Invertebrates:**

Gegenes hottentota, Metisela meninx

**Herbs:**

Aloe ecklonis, Boophone disticha, Calamagrostis epigeios var. capensis var. capensis, Crinum bulbispermum, Cyrtanthus tuckii, Disa woodii, Eucomis autumnalis, Eulophia foliosa, Gladiolus dalenii, Gladiolus elliotii, Gladiolus papilio, Habenaria filicornis, Haemanthus montanus

**Action**

Construction of access roads and traces are likely to cause vegetation disturbance. Noise can also frighten the said species.

**Mitigation measures**

Removed topsoil must be placed on the stockpile area.

The topsoil stockpile will not exceed the height of 3m, and that the soil will be used as soon as possible. Replacement of the topsoil will be conducted in accordance with the soil horizons of the area applied for.

## Soil



Figure 9: Soil type

Mainly red (Ba) or yellow (Bb), apedal (=structureless) soils, moderately (mesotrophic) to highly (dystrophic) leached (low to moderate fertility status), with a wide textural range, mostly sandy loam to sandy clay loam. Soils contain a greyish subsoil layer (plinthic) where iron and manganese accumulate in the form of mottles, due to a seasonally fluctuating water table. With time these mottles may harden (or even cement) to form concretions. These plinthic layers will cause restricted water infiltration and root penetration. In drier areas, however, they may help to hold water in the soil that plants can use.

The soil particles are highly affected by the occurrences of acid mine drainage within the undermined adjacent area. During raining seasons, ground water percolate from old underground working carrying high acid content. The said pollution has dramatically degraded the soil quality within the vicinity of the area applied for.

### **Action**

The proposed coal mining during construction and operational phases will result in the removal of the topsoil layer, which will disrupt the soil profile.

### **Mitigation measures.**

Removed topsoil must be placed on the stockpile area.

The topsoil stockpile will not exceed the height of 3m, and that the soil will be used as soon as possible. Replacement of the topsoil will be conducted in accordance with the soil horizons of the area applied for

Surface water

The surface water of the area

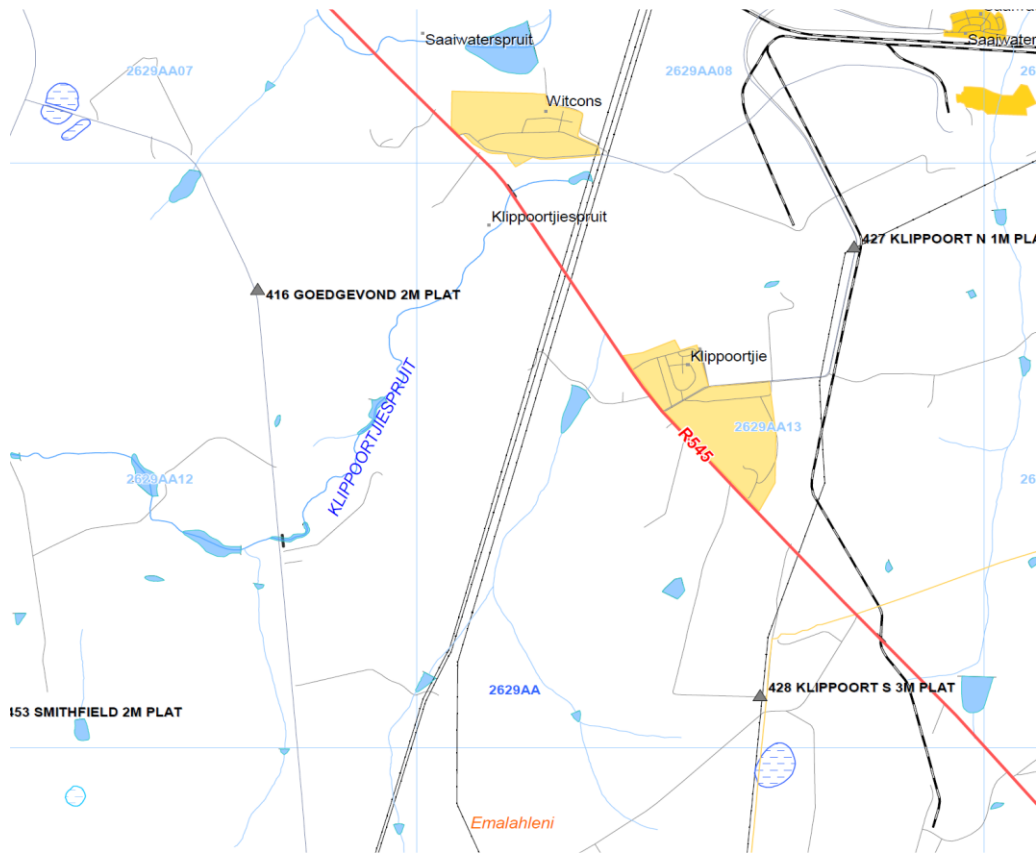


Figure 10: surface water map

**Status**

Water demands by industry, mining and irrigation account for > 75% of the water used in the Olifants river catchment (Ashton et al., 2001). Three inter-basin transfer schemes convey water from the Vaal system in South Africa into the headwaters of the Olifants River to provide domestic water supplies as well as cooling water for several coal-fired thermal power stations (Ashton et al., 2001).

The Olifants River has a catchment area of about 54 750 km<sup>2</sup>, a mean annual runoff of 2 400 x10<sup>6</sup> m<sup>3</sup> and is subject to intensive mining activities in most of its 9 sub-catchments. The major rivers contributing to the Olifants River are the following:

The Blesbokspruit is a main tributary which supplies Klipspruit on the northern side which are on the western sud-catchment of the olifants River

The health of the upper Olifants River has deteriorated over the last decade. Lake Loskop receives water from the upper catchment of the Olifants and serves as a catchment sink. The potential pollution sources in the upper Olifants river

	<p>catchment area include seepage of acid mine drainage from several abandoned and active coal mines, factories, smelters, sewage plants, etc. (Driescher, 2008; Mpumalanga Province, 2003).</p> <p>The Wilge sub-catchment of the Olifants River joins the Olifants River immediately upstream of the Loskop Dam. This catchment is underlain by the Karoo Supergroup rocks surrounded by dolomite and limestone, which issue sufficient water to ensure that the river is perennial. There is limited mining and quarrying activity in this sub-catchment, thus mining-related impacts are minimal. However, there are minor discharges of treated domestic effluent from Bronkhorstspuit and Cullinan and there is a large water supply dam (Bronkhorstspuit Dam). Characteristic of the Wilge sub-catchment are the small wetlands that form on the uphill side of protruding dolerite formation (Ashton et al., 2001).</p> <p>The Klein Olifants-Riet sub-catchment of the Olifants River exhibits similar hydrological features to the Wilge sub-catchment. It includes the coal mining towns of Witbank and Middleburg and receives additional water via inter-basin transfer from the Vaal, Usutu and Komati systems. All of the rivers and streams in the sub-catchment are perennial. The Little Olifants-Riet sub-catchment of the Olifants River is largely underlain by the Ecca Group and Dwyka Formation of the Karoo Supergroup. To the north the area is underlain by acid and intermediate intrusive formations of the Waterberg Group. Additionally, there are small areas of dolomite and limestone in the northern part of the sub-catchment (Ashton et al., 2001).</p> <p><b>Action</b></p> <p>Site establishment and access upgrading will result in runoff containing silt material entering into the stream.</p> <p><b>Mitigation measures</b></p> <p>Minimise the potential ingress of water into the sump. No mining activities will be conducted from any dam, perennial pan, river etc, therefore there will be a 100m radius buffer zone from any water courses.</p>
Groundwater	<p><b>Status</b></p> <p>Groundwater systems are recognised in the proposed area. These are represented by (a) perched groundwater; (b) Karoo sediments porosity associated with weathering and (c) fractured rock. These groundwater systems ranges from 10m up to 30m in depth</p> <p>The proposed mining areas are situated adjacent to old mining workings which are currently abandoned. The proposed mining operation is 100m away from the said abandon mining. As a result, the proposed mining operation will comply with the requirements of Mine Health and Safety Act.</p> <p><b>Action</b></p>



Excavation of coal material will result in contamination of the groundwater.

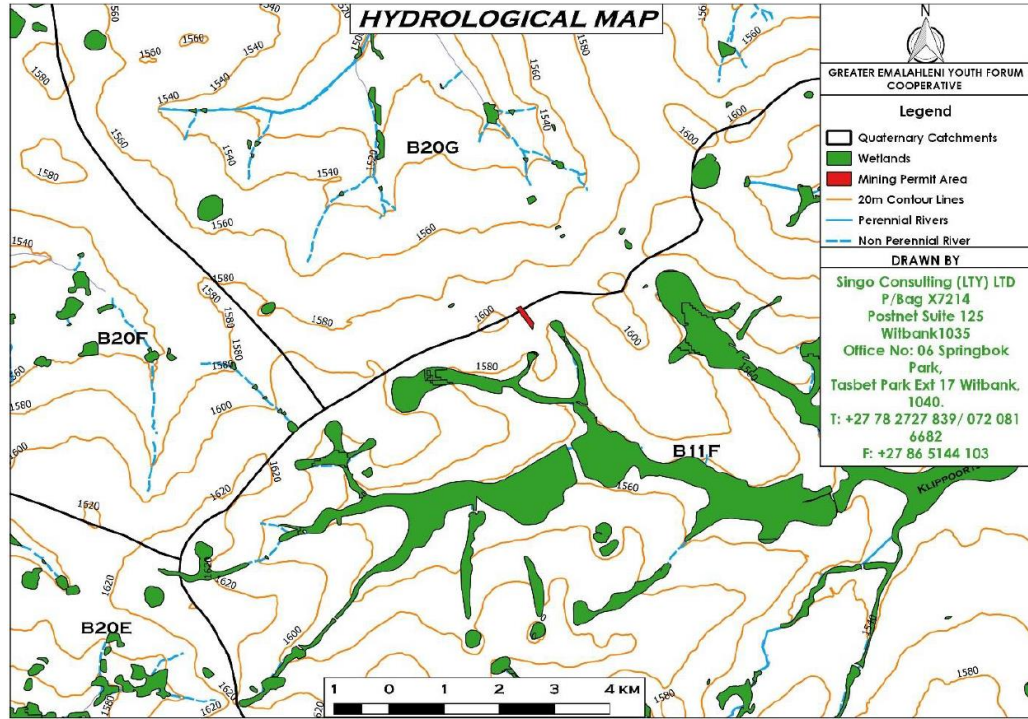


Figure 11: Groundwater Model

**Mitigation measures**

Topsoil, subsoil and overburden removed from the mining area will be stored separately and protected from being eroded by either wind or water. Concurrent rehabilitation will be conducted to reduce the chances of water infiltrating into groundwater and result in polluting the aquifers.

The clay material will be utilised for rehabilitation which will assist in sealing the mining area. And a pillar of 30 metres wide will be left between the proposed mining operation and old underground working to ensure that no water flow from old working into the proposed mining operation. No decanting is anticipated as per the geo hydrological study due to the size of the area and the proposed rehabilitation plan.

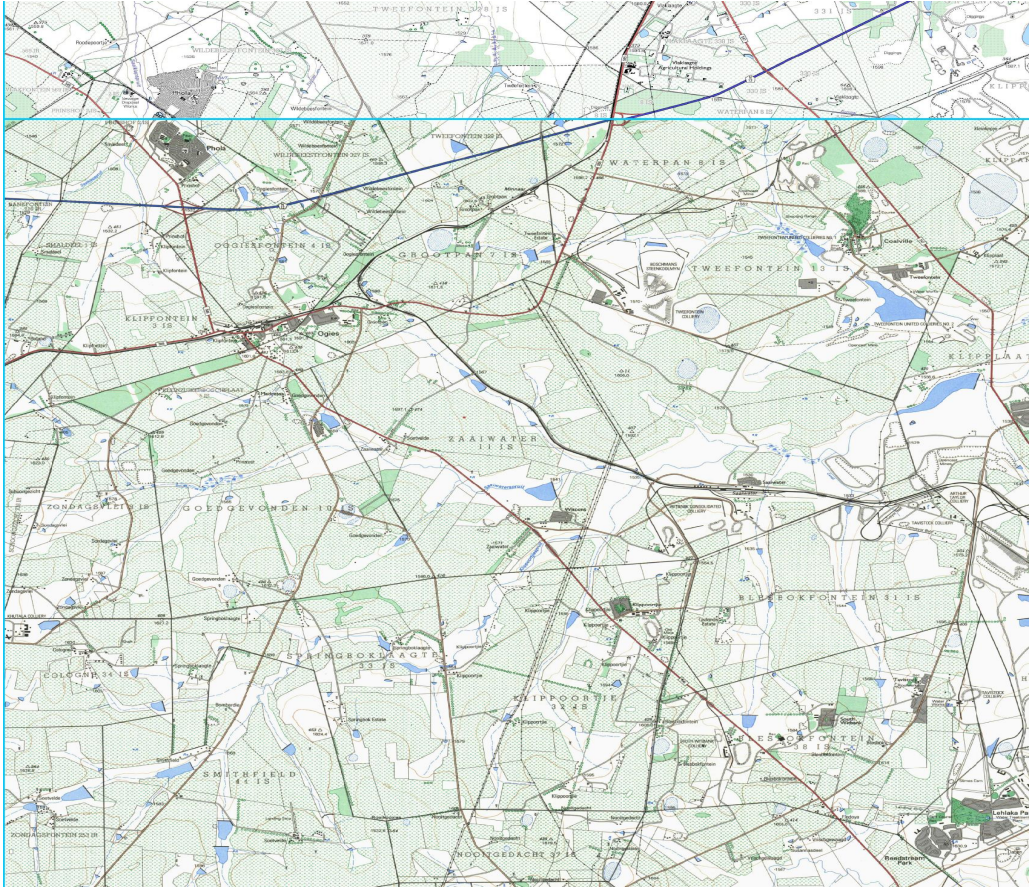
Public roads N12, R555 & (R545)

**Status**

The area applied for constitutes small farm access roads which are available. The proposed area from the farm it is adjacent to R545 provincial road runs adjacent to the proposed mining operation.

**Action**

mining operation on this structures will contravene the provision of Mine Health and Safety Act

	<p><b>Mitigation measures</b>  No mining activities will be conducted within 100m of any structures including public roads, rail-way line etc.</p>
Graves	<p>The proposed mining permit area has conducted cultural features, graves or any heritage features were observed the vicinity of the proposed site</p> <p>Attached is a Phase 1 HIA study conducted</p>
Railway line	<p>There is no railway line in close proximity of the proposed mining area. No mining will be conducted within 100 metres from railway, road, power lines, graves/historic significant etc.</p>
Plan of the mining area (2)	<p>1.3 Map showing the spatial locality of all environmental, cultural/heritage and current land use features identified on the site.</p>  <p>Figure 12: Environmental Aspects</p>



	<p><b>Measures and avoidance</b></p> <p>Regulation 17(7) - there will be no erection or construction of any building, roads railways, power lines, or any structures within a horizontal distance of 100 meters from the working of mining activities, or such lesser distance and at such position and subjected to such restrictions and conditions, determined by Regulation 17(7)(a) risk assessment; or 17(7)(b) by the Chief Inspectors of Mines.</p>
Description verification	<p>1.4 Confirmation of the description of the environment with the input of community, landowners or interested and affected parties.</p> <p>-The landowner was consulted and the proof of such consultation is attached as annexure to the document.</p>

**(b) Description of the current land uses.**

The proposed mining operation is situated on the farm kleinzuikerboschplaats 5 IS visibility of the area is on the left side of the road (R545) from Ogies. The project is located within the Magisterial District of Witbank, under the jurisdiction of the Emalahleni Local Municipality, located within the Nkangala District Municipality.

Mining on the proposed area will assist in the followings:

- Eliminate the illegal mining operation
- Rehabilitation of the land for development purposes including agriculture
- Eliminate the criminal activities
- Removal of invader species.

In light of the above, the proposed mining operation is an ideal to the current land and the community at large.

**(c) Description of specific environmental features and infrastructure on the site.**

The area constitutes invader species as a result of the previous mining operation as well as informal roads. The vegetation found on the area has been greatly compromised by previous mining activities.

**(d) Environmental and current land use map.**



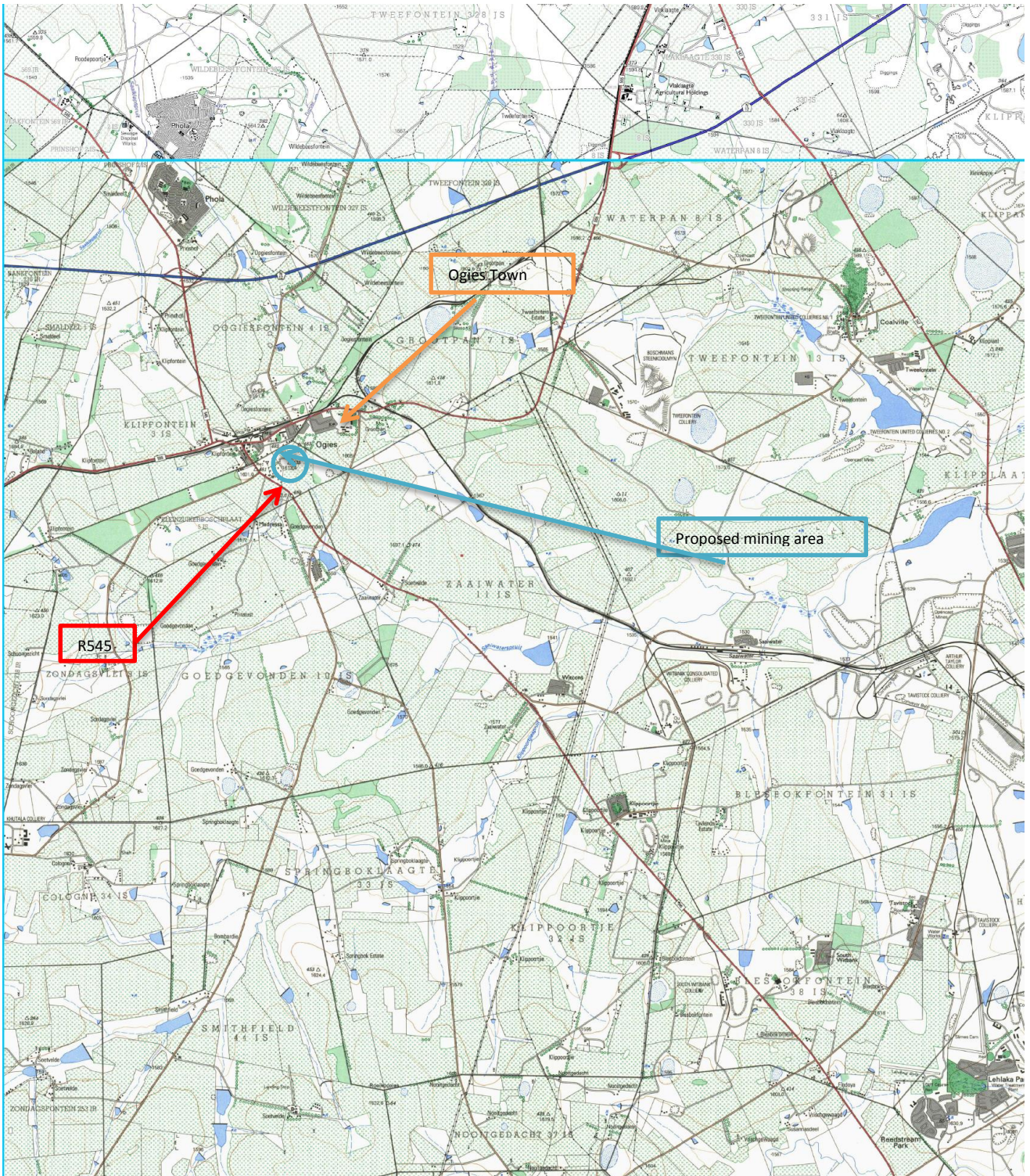


Figure 13: Current Land use



**v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts**

Activity	Environmental Impacts	Environmental aspects	Measures to prevent, mitigate, minimize or manage the impacts
<b>CONSTRUCTION PHASE</b>			
Access road	Noise	Movement of vehicles during the creation of road	Equipment and vehicles equipped with standard exhaust systems which minimize the amount of emissions Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installing exhaust mufflers. Noisy machinery to be used during daylight hours preferably. Grievance mechanism to record complaints should be kept on site and investigated. Noise monitoring to take place.
	Air	Dust caused by Clearance of vegetation	Dust suppression measures such as spraying with water Dust monitoring must be undertaken in accordance to monitoring program
	Water	Disturb the smooth flow of surface water	Water monitoring program will take place and management of water will be conducted and contained within the mining area
	Soil	Clearance of vegetation	Managed and monitored
Mobile structures (office, security dwellings, ablution and screening)	Noise	None	None
	Air	None	None
	Water	None	None
	soil	None	None
<b>Construction of clean and dirty trench</b>	Noise	To prevent the noise emanating from construction machinery from impacting on the sensitive receptors	Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installing exhaust mufflers. Noisy machinery to be used during daylight hours preferably. Grievance mechanism to record complaints should be kept on site and investigated. Noise monitoring to take place.
	Air	Dust Clearance of vegetation and topsoil	Dust suppression measures such as spraying with water
	Water	Disturb smooth flow of surface water	Area of disturbance must be in line with the mine plan provided to minimize the loss of catchment area

		To protect existing users of surface water impacts on water quality	The area excavated should have berms that are vegetated in order to separate dirty and clean water systems, and an erosion control measure
	Soil	Clearance of vegetation and topsoil	The soil will be managed accordingly within the mining area
<b>Construction of pollution control dam</b>	Noise	To prevent the noise emanating from construction machinery from impacting on the sensitive receptors	Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installing exhaust mufflers. Noisy machinery to be used during daylight hours preferably. Grievance mechanism to record complaints should be kept on site and investigated. Noise monitoring to take place.
	Air	Dust Clearance of vegetation	
	Water	Prevent contamination of surface and ground water	The area excavated should have berms that are vegetated in order to separate dirty and clean water systems, and an erosion control measure
	Soil	Clearance of vegetation and topsoil	The soil will be managed accordingly within the mining area
<b>Waste facility</b>	Noise	None	None
	Air	None	None
	Water	Prevent contamination of surface water by throwing or disposing on the wet land	Storage facility with bonding must be constructed Debris will be removed and disposed off in approved site
	Soil	None	Place waste receptacles at strategic points Monitor housekeeping behaviour and insist on corrective action Waste will be disposed off in approved sit

<b>OPERATIONAL PHASE</b>			
<b>Preparation of mining area (Strip 1, 2 &amp; 3)</b>	Noise	Prevent the noise emanating from the construction machinery from impacting on the sensitive receptors	The operation will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulations as well as other applicable legislation regarding noise control Employees will be equipped with ear plugs and other protective gear. All vehicles will be equipped with silencers and maintained in a roadworthy condition
	Air	Dust	Dust suppression measures such as spraying with water
	Water	Land degradation, land-use and capability	Siltation of surface water resources will be minimized by road wetting. The areas excavated should have berms that are vegetated in order to separate dirty and clean water systems while enhancing the maximization of clean and minimization of dirty areas and water systems respectively, and as an erosion control measure. The stockpiles must be vegetated to prevent erosion and subsequent siltation of clean and dirty water streams as well as surface water resources. Upslope diversion and down slope silt containment structures will be constructed. Monitoring of surface water resource pre-mining and during construction must be implemented in order to be used during operation, decommissioning and post-closure as per the monitoring programme.
	Soil	Limit the soil disturbance outside the mining area	Movement of vehicles will be restricted to designated areas
<b>Waste facility</b>	Noise	None	None
	Air	None	None
	Water	Water Pollution	Container will be placed on a designated area Waste will be disposed in approved site
	Soil	None	Place waste receptacles at strategic points Monitor housekeeping behavior and insist on corrective action

			Waste will be disposed off in approved site
Temporary stockpile area (top soil, overburden and ROM)	Noise	To prevent the noise emanating from the construction machinery from impacting on the sensitive receptors	A noise barrier in the form of a berm should be constructed on proposed area of disturbance (as per current mine plan) so that it is situated between the main noise source and sensitive noise receptor, as close to the noise sources as possible. The berm will help with the attenuation of noise produced by the mining activities.
	Air	Reduction of dust fallout levels and particulate matter	Vegetation needs to be encouraged on all soil stockpiles to reduce dust levels.
	Water	Contamination	Prevent soil erosion and keep water channel clean, monitor groundwater Siltation of surface water resources will be minimized by road wetting. The areas excavated should have berms that are vegetated in order to separate dirty and clean water systems while enhancing the maximization of clean and minimization of dirty areas and water systems respectively, and as an erosion control measure
	Soil	Reduction of area of soil compaction	Ensure all activities occur within designated areas. Compile accurate soil map showing classification, thickness, fertility status. Remove and stockpile topsoil in berms or heaps less than 2 – 3 m high. Do not use as storm water control feature. Vegetate with diverse grass mix to control erosion. Wetland soils should only be stockpiled at heights of 1 – 2 m. Subsoil stockpiles can be bigger but must be protected against erosion similar to topsoil stockpiles
Loading and hauling of material	Noise	Movement of vehicles	
	Air	Dust	Dust suppression by watering
	Water	Water pollution	Operate outside 100 m distance from stream or any water body Control and manage storm water Prevent soil erosion and keep water channel clean, monitor groundwater
	Soil	Reduction of area of soil compaction	All vehicles must remain on haul roads and within demarcated area



<b>DECOMMISSIONING AND CLOSURE PHASE</b>			
<b>Activity: De-establishment / removal of infrastructure</b>	Noise	Movement of vehicles	<p>The operation will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulations as well as other applicable legislation regarding noise control</p> <p>Employees will be equipped with ear plugs and other protective gear. All vehicles will be equipped with silencers and maintained in a roadworthy condition</p>
<b>POST CLOSURE</b>			
<b>Ground water monitoring</b>	Water (ground water)	Contamination of ground water	<p>Existing boreholes will be utilized to monitor the quality of the underground two years after closed</p> <p>Sealing of the pit at mine closure to prevent decant at pit, allow groundwater levels to recover and baseflow to be reinstated. Water will then be discharged via the natural/present ways (e.g. springs). The water quality of the springs must be monitored; and</p> <p>The monitoring programme and data should be reviewed by an independent hydrogeologist annually and routinely amended if necessary;</p> <p>Investigate the vertical profile of hydraulic conductivities specifically in relation to the coal seams in shallow and deep coal seam areas including coal seam, seam roof and - floor;</p>

			<p>Carry out a recharge investigation to quantify specifically (i) stream loss on high ground and (ii) direct infiltration; Conduct further geochemical testing, including testing of country rock and field testing, to provide more confidence in the current results which are not statistically robust. Subject to the results of these tests, it is recommended that the mine residue management strategy be reviewed, when necessary.</p>
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**vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;**

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

**Criteria of assigning significance to potential impacts**

<p><b>TIMING</b> Immediate Construction/operation Rehabilitation</p>	<p><b>DURATION</b> Short term = 0-6 months</p>	<p><b>EXTENT</b> On-site Local = 0-40 km radius District, Regional, National</p>
<p><b>PROBABILITY</b> Definite: 100% probability of occurrence High: 99-50% probability of occurrence Moderate: 49-15% of occurrence Low:&lt;15% probability of occurrence</p>		<p><b>INTENSITY/SEVERITY</b> High: 100-50% degree of change in area of direct effect/impact Medium: 50-15% change in the area of effect Low:&lt;15% change in area of effect</p>
<p>The significance of the unmanaged and managed impacts has been assessed through consideration of the probability of the impact occurring, the extent over which the impact will be experienced, and the intensity/severity of the impacts.</p> <p><b>Negligible:</b> the impact is non-existent or insubstantial, is of no or little importance to any stakeholders and can be ignored.</p> <p><b>Low:</b>the impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is unlikely to require management intervention carrying significant costs.</p> <p><b>Moderate:</b> the impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.</p> <p><b>High:</b> the impact could render development options controversial or the entire project unacceptable if it cannot be reduced to acceptable levels, and/or the cost of management intervention will be a significant factor in project decision-making.</p>		

**(vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.**

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

The area applied for constitutes numerous mining activities which all apply similar mining method including the mining type. As a result, the mining commence at the shallow areas of the coal deposit and continue with con-current rehabilitation applied at the same time.

Minimal activities are planned on site, which appears that alternatives were not possible. In many cases, the mine design take into consideration the control on the storm water as well as the groundwater which also dictates the mining operation.

**viii) The possible mitigation measures that could be applied and the level of risk.**

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

The landowner is SAIMIR Prop Inv cc ;

It is therefore identified that impacts such as noise, dust and water pollution are critical on this operation.

**ix) Motivation where no alternative sites were considered.**

The area applied for constitutes numerous mining activities which all apply similar mining method including the mining type. As a result, the mining commence at the shallow areas of the coal deposit and continue with con-current rehabilitation applied at the same time.

Minimal activities are planned on site, which appears that alternatives were not possible. In many cases, the mine design take into consideration the control on the storm water as well as the groundwater which also dictates the mining operation.

**x) Statement motivating the alternative development location within the overall site.**

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

- i) 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. (Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)**

**Risk Classification**

The risks associated with the mining were assessed and ranked according to their environmental significance. The ranking process coded each activity as high, moderate or low risk in accordance with the following process:

The activities were assessed against two criteria: the likelihood of environmental harm occurring and the level of the environmental impacts.

The likelihood of environmental impact was determined by assessing the following:

- Past environmental performance

- Current environmental performance
- Potential contributing factors

The level of environmental impact was assessed by considering factors such as the quantity and toxicity of the material and the sensitivity of the receiving environment.

<b>Environmental Non-Compliance Matrix(Compliance colour coding)</b>				
Level of Non-Compliance		Certain	Likely	Less Likely
	Moderate - High			
	Low - Moderate			
	Compliant			

**j) Assessment of each identified potentially significant impact and risk**

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

Activity, Phase and Impact					Impact Rating (before mitigation)							Impact Rating (after mitigation)							
Impacted Environment	Phase impact occurs (C, O, D, PC)	Activity No.	Activity	Summary of Impact	Reference in EIA	Nature of Impact (positive / Negative)	Extent (5)	Duration (5)	Severity (5)	Probability (5)	Consequence (15)	Significance (75)	Nature of Impact (positive / Negative)	Extent	Duration	Severity	Probability	Consequence	Significance (75)
<b>Biophysical Impacts</b>																			
Geology	C,O	6	Establishment of initial boxcut and access ramps	Rock and overburden will be removed, permanently altering the geology	7.3	N	1	5	3	5	9	45	N	1	5	3	5	9	45
Topography	C,O,D, PC	4 & 6	Site clearing and topsoil removal and establishment of initial boxcut and access ramps	The natural lie of the land will be altered. This alteration of the land will have further impacts on surface water flow dynamics as the natural drainage pattern is disrupted.	7.2/ 11.3.1	N	1	3	4	5	8	40	N	1	3	3	5	7	35
Soil	C	2	Transport of construction material	Compaction of soil	7.4/ 11.3.2	N	3	1	4	5	8	40	N	3	1	3	5	7	35

Activity, Phase and Impact					Impact Rating (before mitigation)							Impact Rating (after mitigation)								
Impacted Environment	Phase impact occurs (C, O, D, PC)	Activity No.	Activity	Summary of Impact	Reference in EIA	Nature of Impact (positive / Negative)	Extent (5)	Duration (5)	Severity (5)	Probability (5)	Consequence (15)	Significance (75)	Nature of Impact (positive / Negative)	Extent	Duration	Severity	Probability	Consequence	Significance (75)	
	C,O	4&5	Site clearing and topsoil removal and construction of infrastructure.	Compaction of soil, erosion of exposed areas and decrease in available land for agricultural practices.		N	2	4	5	5	11	55	N	1	4	4	5	9	45	
	C	6	Establishment of initial boxcut and access ramps	Compaction of areas surrounding box cut. Loss of arable soil.		N	1	4	4	5	9	45	N	1	4	4	5	9	45	
Surface water	C	5 & 6	Construction of surface infrastructure and establishment of initial box cut and access ramps	Reduction in base flow and in catchment area size and a change in flow dynamics		N	3	4	4	4	11	44	N	3	4	3	4	10	40	

Activity, Phase and Impact					Impact Rating (before mitigation)							Impact Rating (after mitigation)							
Impacted Environment	Phase impact occurs (C, O, D, PC)	Activity No.	Activity	Summary of Impact	Reference in EIA	Nature of Impact (positive / Negative)	Extent (5)	Duration (5)	Severity (5)	Probability (5)	Consequence (15)	Significance (75)	Nature of Impact (positive / Negative)	Extent	Duration	Severity	Probability	Consequence	Significance (75)
Air Quality	C,O	4,5 & 6	Site clearing and topsoil removal ,construction of infrastructure, establishment of box cut	Increased vehicle movement on site and the clearing of topsoil to expose subsoil's will increase the dust fallout on site and the PM10 levels	7.7/ 11.3.5	N	2	3	3	5	8	40	N	1	3	2	4	6	24
Wetlands	C,O	4 & 6	Site clearing and topsoil removal and establishment of initial boxcut and access ramps	Increase the potential load of sedimentation of the water resources. Erosion of exposed surfaces. The removal of the topsoil and vegetation reduces the potential for recharge of shallow aquifers that feed hillslope wetlands, which in turn reduces the flow in water resources. Possible dewatering of aquifers and loss of perched aquifer and interflow between certain wetland areas.	7.12/ 11.3.10	N	2	4	5	5	11	55	N	2	4	5	4	11	44
<b>Social Impacts</b>																			
Visual	C,O,D	4 & 6	Site clearing and topsoil removal and establishment of initial boxcut and access ramps	The project site will become noticeable as it will be in stark contrast to surrounding areas	7.13/ 11.3.11	N	2	3	3	5	8	40	N	2	3	2	5	7	35



Activity, Phase and Impact					Impact Rating (before mitigation)							Impact Rating (after mitigation)							
Impacted Environment	Phase impact occurs (C, O, D, PC)	Activity No.	Activity	Summary of Impact	Reference in EIA	Nature of Impact (positive / Negative)	Extent (5)	Duration (5)	Severity (5)	Probability (5)	Consequence (15)	Significance (75)	Nature of Impact (positive / Negative)	Extent	Duration	Severity	Probability	Consequence	Significance (75)
	C,O,D	5	Construction of surface infrastructure	Agricultural land-use is transformed to that of mining. Once the infrastructure is established and lighting installed there will be light pollution in the evenings		N	3	3	3	5	9	45	N	2	3	2	5	7	35
Traffic	C,O	2	Transport of construction material	Increase of vehicular activity on site and the traffic to the site	7.13/11.3.11	N	3	2	3	5	8	40	N	3	2	2	4	7	28

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked **Appendix**

**k) Summary of specialist reports.**

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Groundwater Study	Ground water quality should be monitored quarterly to see if there are changes in terms of quality due to mining activity that will be on going. All boreholes should be surveyed to determine actual collar heights in meters above means sea level. All groundwater level and groundwater contours should then be reported in terms of ground elevations, making for a much more accurate presentation of groundwater levels and flow patterns After closure ground water level and quality should be monitored to see rehabilitation is introducing any good improvements to the groundwater. This should be considered only if the mining activity had negative impacts on the groundwater		

## I) Environmental impact statement

### (i) Summary of the key findings of the environmental impact assessment;

The topography on the site consists of a gradual slope. A small seasonal stream is located. The area lies within a summer rainfall region with an average annual rainfall. There is a large difference between summer and winter average temperatures with frost regularly occurring in winter.

### (ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers .

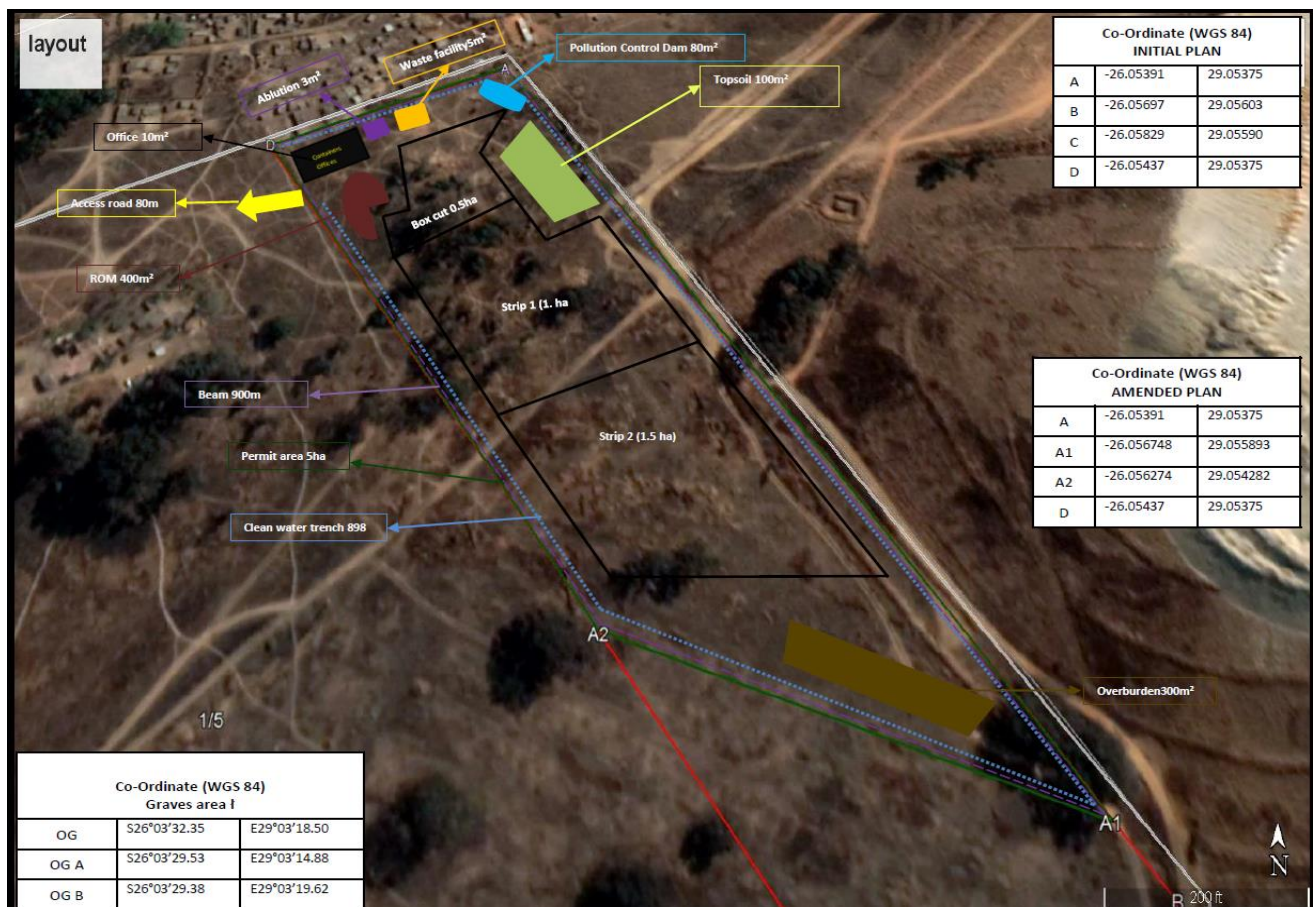


Figure 14: Mining Infrastructures

### (iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

Phase – Activities	Impact/Risk	Alternatives
<b>Construction</b> <ul style="list-style-type: none"> <li>- Employment</li> <li>- Vegetation Removal</li> <li>- Excavation</li> <li>- Machinery Movement</li> </ul>	<p>Increased ambient noise levels resulting from mining activities.</p> <p>Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders.</p> <p>Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.</p>	Due to the size of the operation, minimal alternative could be identified
<b>Operational</b> <ul style="list-style-type: none"> <li>- Drill and Blasting</li> <li>- Hauling and Loading</li> <li>- Stockpiling</li> <li>- Crush and screening</li> </ul>	<p>Increased vehicle activity within the area resulting in the possible destruction and disturbance of fauna and flora.</p> <p>Poor access control to farms which may impact on cattle movement, breeding and grazing practices.</p>	
<b>Closure</b> <ul style="list-style-type: none"> <li>- Removal of foreign material</li> <li>- Scruping and contouring</li> <li>- Rehabilitation</li> <li>- Retrenchment</li> </ul>	<p>Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime.</p>	

**m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;**

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

The objectives of the EMPr will be to:

Provide sufficient information to strategically plan the mining activities as to avoid unnecessary social and environmental impacts. In that, drilling monitoring boreholes as recommended by Groundwater Study

Provide sufficient information and guidance to plan mining activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.

Ensure an approach that will provide the necessary confidence in terms of environmental compliance. Provide a management plan that is effective and practical for implementation.

Through the implementation of the proposed mitigation measures, it is anticipated that the identified social & environmental Impacts can be managed and mitigated effectively.

Through the implementation of the mitigation and management measures it is expected that:

Noise impacts can be managed through consultation and through the restriction of operating hours;

The pollution of soil and water resources can be effectively managed through containment by water management infrastructure.

Ecological impact can be managed through the implementation of pollution prevention measures, minimizing land clearing, restricting working hours (faunal disturbance) and rehabilitation.

Concerns regarding access control to farms can be managed through the development and ensuring compliance to an appropriate access control procedure.

Risks associated with crime can be mitigated through avoiding recruitment activities on site, as well as monitoring and reporting.

Visual impact can be minimized through giving consideration to site infrastructure placement and materials used.

**n) Aspects for inclusion as conditions of Authorisation.**

Any aspects which must be made conditions of the Environmental Authorisation

No activities may be undertaken within 100m of the surface water including the adjacent river without prior approval of the Department.

No mining activities must be conducted within 30m of the underground workings

No activities will be conducted without the appointment of the environmental control officer on site

No mining activities must be conducted without dust monitoring devices installed on site

**o) Description of any assumptions, uncertainties and gaps in knowledge.**

(Which relate to the assessment and mitigation measures proposed)

Due to significant time constraints allowed for the assessment of the impacts, and at the time of compiling the draft Basic Assessment Report and EMP:

- Not all interested and affected parties were consulted with in person.
- Details from the DWS regarding Water Use Licensing requirements is not yet available.
- Details regarding the presence and status of land claims are not available.

**p) Reasoned opinion as to whether the proposed activity should or should not be authorized**

- i) Reasons why the activity should be authorized or not

It is the opinion of the EAP that the activity may be authorized.

The site is therefore regarded as the preferred site and alternative sites are not considered.

The option of not approving the activities will result in a significant loss of economic development and continuation of environmental degradation.

ii) **Conditions that must be included in the authorisation**

No activities may be undertaken within 100m of the surface water including the adjacent river without prior approval of the Department.

No mining activities must be conducted within 30m of the underground workings

No activities will be conducted without the appointment of the environmental control officer on site

No mining activities must be conducted without dust monitoring devices installed on site

**q) Period for which the Environmental Authorisation is required.**

The application for mining permit has been applied for a period of two 2 years including the decommissioning and rehabilitation

**r) Undertaking**

(Confirm 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 Basic assessment report and the Environmental Management Programme report.)

An undertaken by the EAP and the client is provided for in Section 2 of the EMP

**s) Financial Provision**

(State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation)

According to the section 24P of the Act: Financial provision for remediation of environmental damage (1) 'An applicant for an environmental authorization relating to prospecting, exploration, mining or production must, before the Minister responsible for mineral resources issues the environmental authorisation, comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts'.

The "Guideline Document for the Evaluation of Financial Provision made by the Mining Industry" was developed by the DMR in January 2005, in order to empower the personnel at Regional DMR offices to review the quantum determination for the rehabilitation and closure of mining sites.

With the determination of the quantum for closure it must be assumed that the infrastructure has no salvage value (clean closure). The closure cost estimate (clean closure) was determined in accordance with the DMR guidelines and is based, where possible, on actual costs provided by a third party contractor. The closure costs are as follows:



**State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.**

**i) Explain how the aforesaid amount was derived.**

Identify all the mining activities with their extent and used the DMR financial provision guidelines in order to determine their categories. Insert all the extent on various categories and obtain the required financial provision.

**ii) Confirm that this amount can be provided for from operating expenditure.** (Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

It is hereby undertaken that the amount of R 869 161.00, in the form of a bank guarantee for rehabilitation purposes as required in terms section 24P of the Act., will be provided to the DMR upon granting of the requested mining right. This amount is specifically calculated for final rehabilitation purposes and excludes concurrent rehabilitation.

**t) Specific Information required by the competent Authority**

- Baseline Environment
- Mining Activities
- Impacts associated with the Impacts
- Mitigation Measures
- Sustainable Development of the Project
- Land use after the proposed project.

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

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

The project will create employment of approximately 500 people within the residential area wherein each person might be supporting four people, then an about 2500 individuals will benefit from this project.

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

During the site visit, there was no known cultural/archaeological/heritage site identified on the area of concern that can be affected by the proposed mining permit activities.

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

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



## PART B

### ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

#### 1) Draft environmental management programme.

- a) **Details of the EAP**, (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

The requirement for the provision of the details and expertise of the EAP are included  
Please see appendices

- b) **Description of the Aspects of the Activity** (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

The requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A

**c) Composite Map**

(Provide a map (**Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

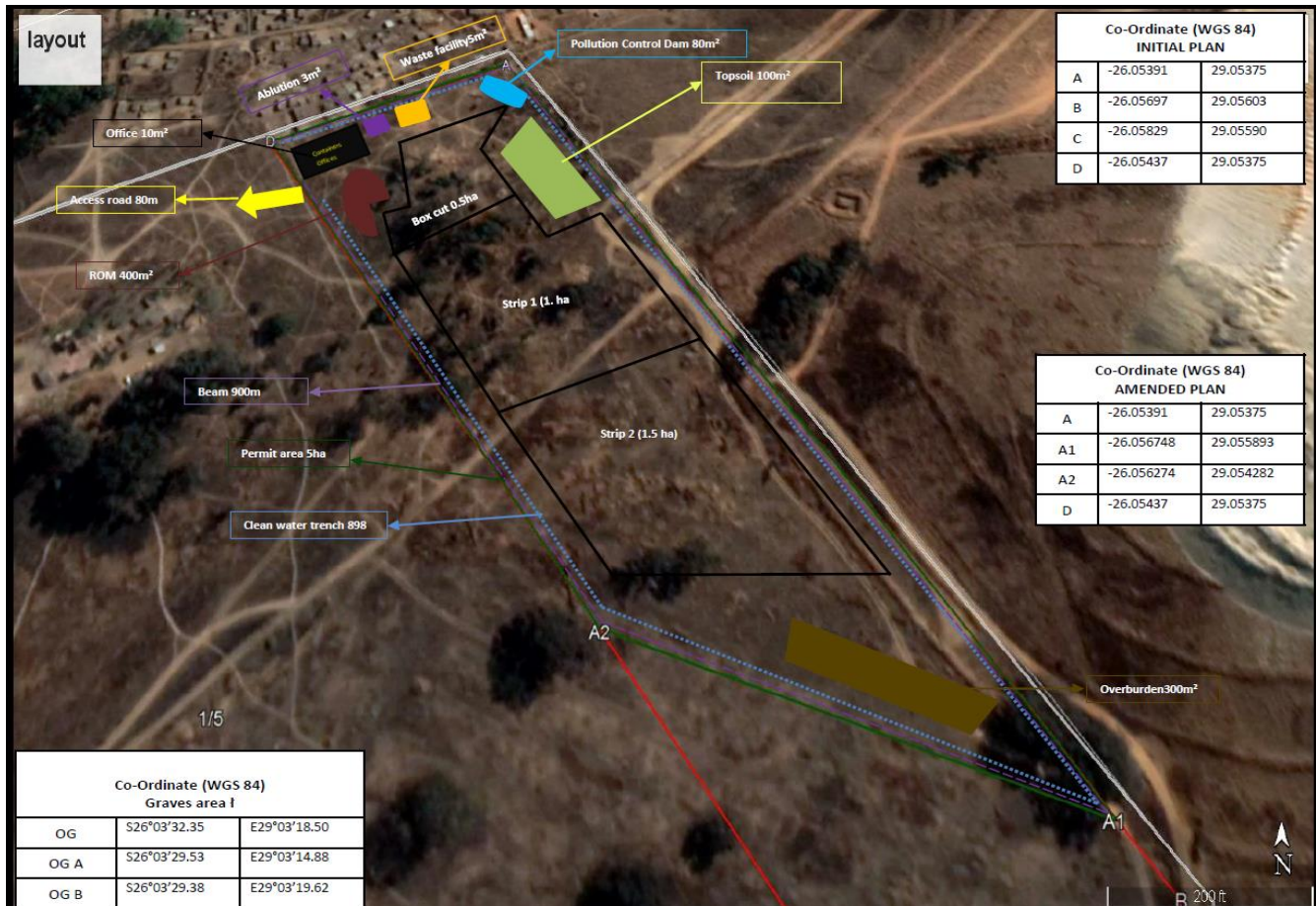


Figure 15: Infrastructural Plan

**d) Description of Impact management objectives including management statements**

(i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described)

- Ensure that all the soil profile is return in accordance with their original horizons.
- Preserve the topsoil and ensure that it keep its fertility in order to retain the vegetation of the area.
- Ensure that all foreign material including carbonaceous material are cleared from the site.
- Contour the area in order to ensure that storm water does not wash the topsoil into the nearby stream.
- Encourage the vegetation growth through watering and seeding the rehabilitated areas.

(ii) **Volumes and rate of water use required for the operation.**

An amount of 17300cm<sup>3</sup> will be used for dust suppression and sanitation.

(iii) **Has a water use license has been applied for?**

The use of groundwater will be Generally Authorized in terms of the NWA. Based on the outcomes of discussions with the Department of Water Affairs, the potential abstraction of water due to mining activities will be clarified. Should it be deemed necessary, on instruction by the department, to submit a water use license application, this will be undertaken.

(iv) **Impacts to be mitigated in their respective phases**

Measures to rehabilitate the environment affected by the undertaking of any listed activity is presented in the following table.

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
1	Recruitment, procurement and employment	Socio-economic	Ensure that recruitment strategies for the mine prioritises the sourcing of local labour, and share in gender equality. Empower the workforce to develop skills that will equip them to obtain employment in other sectors of the economy. Contribute to the sustainable development of a community (not dependent on the mine) surrounding the area of operation	Positive impact will be implemented through LED initiative as part of Social and Labour Plan and local development and need to be managed. Ad-hoc, informal recruitment at the gate or through other unapproved channels by setting up recruitment stands in built up areas should be prohibited. Relationships with local government through LED programmes should be developed. Stakeholder database should be established to identify partners and develop collaborative networks	Ongoing	As per Social and Labour Plan	The social plans to involve action plans aimed at providing development opportunities and benefits to the affected local communities.	Construction phase	HR manager	N/A
2	Transport of construction material	Soil	Minimization of disturbed area and prevention of compaction of soil	All heavy machinery operators and truck drivers should stay in designated areas	Ongoing		Rehabilitation and closure plan	LoM	Mining engineer and environmental coordinator	R 15 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Noise	To prevent the noise emanating from the Transport vehicles from impacting on the sensitive receptors	Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installing exhaust mufflers. Noisy machinery to be used during daylight hours preferably. Grievance mechanism to record complaints should be kept on site and investigated. Noise monitoring to take place.	Ongoing. Monitoring to be weekly.	NEMAQA , ECA	Noise monitoring programme to be followed. Vehicle maintenance plan. Contractors operating EMP	LoM	Environmental officer, contractor or manager	R 37 000
		Biodiversity & Aquatic environment	Restrict removal and disturbance of vegetation to those areas absolutely essential for the development	Make use of existing roads and/or areas and roads designated for the mining operation	Ongoing	NEMA & NWA	Rehabilitation and closure plan	LoM	Mining Engineer	R43 000
	Avoid impacts to vegetation and soil through spillages and leaks		Proper maintenance of operating vehicles and regular vehicle inspections. Parking of trucks in designated, concrete areas.				Vehicle maintenance and Monitoring programme	LoM	Environmental /safety officer	
	Limit the negative effects of excessive dust and erosion		Remove loose earth from the road sides. Periodic spraying of roads with water.	On going	Air quality monitoring plan		LoM	Environmental officer		
		Visual	Limit the extent of the visual intrusion as far as possible	Dirt roads need to be wet by a water browser so as to reduce dust plumes.	On going		Ambient air quality standard operating procedure including monitoring plan	LoM	Environmental officer	R28 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Traffic and safety	Create safe environment for pedestrians, animals and motorists	Speed limits must be implemented on site as well as safety controls. Investigations into the requirement of safety intersections must be undertaken	Continuous		Grievance Mechanism	LoM	Safety officer	R15 000
3&9	Storage of fuel, lubricant and explosives	Surface Water	Prevention of contaminate surface runoff	All hazardous chemical must be stored in a bunded facility. Handling of such chemicals must be undertaken on a non-permeable surface. All water that may collect in an area used for the storage of hydrocarbons must pass through an oil water separator before being discharged as dirty water. Spillages on the open soil must be contained and removed and treated as hazardous waste. Inspections should be conducted of storage facilities.	Monthly	NWA, SANS	Hydrocarbon management plan/operation procedure	LoM	Environmental officer	R75 000
		Biodiversity and Aquatic Environment	Avoid impacts to vegetation and soil by means of leaks and spillages.	The storage of materials and substances will be housed in suitable facilities. Management of these facilities will be ongoing and this will include regular inspections to detect faults/issues. Emergency response plan to be put in place if spillages occur.	Monthly	NEMA	Hydrocarbon management plan/operation procedure	LoM	Environmental officer	
		Groundwater	Prevent contamination of aquifers	All hydrocarbons, lubricants and explosives should be adequately stored and bunded off to prevent any contamination to the groundwater during an accidental spill.	Monthly inspections	NWA	Spill Prevention, Emergency response plan	Construction phase	Environmental Officer	R10 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
4	Site clearing and topsoil removal	Soil	Prevent soil loss through erosion. Preserve topsoil for future rehabilitation.	Ensure all vehicles stay within the designated areas. Ensure storm water control measures are put in place to control surface run off over exposed areas. Remove and stockpile topsoil from roads, building platforms, stockpile and dam areas prior to construction	Ongoing		Storm water management plan/ water management procedure	LoM	Environmental officer	R75 000
		Surface Water	Prevention of siltation of surface water bodies	The areas excavated should have berms that are vegetated in order to separate dirty and clean water systems, and as an erosion control measure. The stockpiles must be vegetated to prevent erosion and subsequent siltation of clean and dirty water streams as well as surface water resources. Upslope diversion and down slope silt containment structures will be constructed. Monitoring of surface water resource pre-mining and during construction must be implemented as per the monitoring programme. Construction of infrastructure located close to local streams should take place in the dry season, when possible.	Ongoing	NWA,DWAF BPG	Storm water management plan/ water management procedure	LoM	Environmental officer	R110 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Air Quality	Reduction of dust fallout levels and particulate matter	The removal of vegetation will be minimised during stripping to reduce the effects of dust pollution as a result of exposed soil. Dust suppression must take place. Dust monitoring must be undertaken in accordance to the monitoring programme. Topsoil stockpiles for more than two days should be kept moist and topsoil stockpiles for more than a year should be planted and water to sustain biological components as well as prevent dust emissions. Cover all trucks hauling soil.	Ongoing/ Quarterly monitoring	NEMAQA	Ambient air standard operation procedure including monitoring programme.  Contractors operational EMP	LoM	Environmental officer	R 47 000
		Noise	To prevent the noise emanating from the construction machinery from impacting on the sensitive receptors	A noise barrier in the form of a berm should be constructed on the western as well as south eastern side of the proposed area of disturbance (as per current mine plan) so that it is situated between the main noise source and sensitive noise receptor UN9, as close to the noise sources as possible. The berm will help with the attenuation of noise produced by the mining activities. The barrier should be at least 13m tall for best performance (Sound Fighter Systems, 2007). Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installing exhaust mufflers. Switching off equipment when not in use.	Ongoing	NEMAQA , ECA	Noise monitoring plan	LoM	Environmental officer	R 15 000



No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Biodiversity & aquatic environment	Limit degradation and destruction of natural environment to designated project areas	Keep the footprint of the disturbed area to the minimum and designated areas only. Vegetate and wet stockpiles to limit erosion. Berms created below the piles to trap particles and runoff from the stockpile. Community awareness should be implemented as part of the stakeholder engagement procedure to create awareness of biodiversity and preservation of natural habitats	Daily	NEMA	Rehabilitation plan	LoM	Mining engineer	R 45 000
	Restrict alien invasive plant recruitment		Removal of vegetation during stripping and dump operation will be minimised to reduce the risk of open areas occurring.	CARA		Alien invasive monitoring and control programme	Environmental officer			
	Limit erosion of exposed areas and stockpiles as well as sediment load reporting to wetlands		Keep the footprint of the disturbed area to the minimum and designated areas only. Vegetate and wet stockpiles to limit erosion. Berms created below the piles to trap particles and runoff from the stockpile	NWA		Rehabilitation plan	Construction, operational phases	Environmental officer		
	Limit reduction in the re-charge of aquifers		Removal of vegetation during stripping and dump operation will be minimised to reduce the risk of the aquifers being drained and not properly recharged.							
		Visual	Reduce the visual impact caused by site clearing and topsoil removal.	Ensure site to be cleared is restricted to the mine plan. Topsoil stockpiles will need to be vegetated as soon as possible, to reduce the risk of erosion and decrease there visual disturbance.	Ongoing		Contractors operational EMP including mine plan	Construction, operational phases	Mining engineer , Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
5	Construction of infrastructure (access roads, water management trenches)	Soil	Prevent loss of soil structure from compacting of soil. Preserve soil fertility for later use.	Remove and stockpile topsoil from roads, building platforms and infrastructure areas prior to construction and stockpile as per the rehabilitation guidelines.	Once-off		Rehabilitation plan	Construction phase	Environmental officer	R 20 000
		Surface Water	To protect existing users of surface water from impacts on water quality. To maximise the clean surface water run-off.	Areas of disturbance must be in line with the mine plan provided to minimise the loss of catchment area. Clean and dirty water separation must be undertaken and clean water areas must be maximised. Reuse of input/dirty water needs to be maximised.	Ongoing	NWA	Contractors EMP & Water monitoring plan/ procedure	Construction phase	Mining engineer and Environmental officer.	R 15 000
		Noise	To prevent the noise emanating from the construction machinery from impacting on the sensitive receptors	As per mitigation for activity 4.	Ongoing	NEMAQA, ECA	Noise monitoring plan	Construction phase	Environmental officer	R 15 000
		Biodiversity & Aquatic environment	Limit areas suitable for alien invasive recruitment	Removal of vegetation during construction of infrastructure will be minimised to reduce the risk of open areas occurring.	Weekly	CARA	Rehabilitation plan	LoM	Mining engineer	R 15 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
			Limit the erosion potential of the site. Preserve the flora, including areas not directly affected by project activities. Ensure rehabilitation plans are initiated during construction	<p>Make use of permeable materials for pavements and walk-ways. Introduce a storm water management programme. Restrict removal and disturbance of vegetation to those areas absolutely essential for the development.</p> <p>Community awareness should be implemented as part of the stakeholder engagement procedure to create awareness of biodiversity and preservation of natural habitats</p>	Monthly	NEMA	<p>Storm water management plan/procedure</p> <p>Community Forums once or twice in a year</p>		Environmental officer	
			Limit the reduction in catchment size	The planned reduction in catchment size will be managed to ensure that there will not be a dramatic reduction in catchment size.	Monthly	NWA	Rehabilitation plan	Construction and operational phase	Environmental officer	
		Visual	Reduce the visual impact of permanent infrastructure	To reduce the visual impact of permanent structures, colours for roofing, walls etc. should be of a matt finish to reduce reflection. The colour chosen should be one that softens the visual impact, colours that are suited to the natural tones in the area, such as pastel browns and greens. Avoid up lighting of structures but rather direct the light downwards and focused on the object to be illuminated.	Once off			Construction phase	Environmental officer	R 13 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
6	Establishment of initial boxcut and access ramps	Soil	Limit soil disturbance outside of the mining plan	Use truck and shovel to minimize compaction of non-mined soil	Continuous		Mine plan and contractors EMP	LoM	Mining engineer and environmental officer	R 150 000
		Surface Water	Maximisation of clean water areas	Separation of clean and dirty water must be undertaken. Clean water areas must be maximised. Reuse of inpit/dirty water needs to be maximised.	Continuous		Waste water management plan / procedure & monitoring plan	LoM	Mining engineer	
		Air Quality	Reduction of dust fallout levels and particulate matter	Pre-wet areas to be excavated to minimize dust. The limit value for the 24 hour average for PM10 is 75 ug/m3 and this may not be exceeded 4 times within a year. The limit value for the yearly average for PM10 is 40ug/m3	Monthly	NEMAQA	Ambient air quality standard operating procedure including monitoring plan	LoM	Environmental officer	
		Noise	To prevent the noise emanating from the construction machinery from impacting on the sensitive receptors	As per mitigation for activity 4.	Ongoing	NEMAQA , ECA	Noise monitoring programme	Construction phase	Environmental coordinator	R15 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Air Blasting and Ground Vibration	Reduction of disturbance to neighbouring activities	Pre blast survey of all structures identified surrounding the mining area. Ground vibration survey in the form of signature trace study to be done for determination of ground vibration constants that can be used for accurate prediction of ground vibration. Redesign with alternative diameter blast holes and charge masses to accomplish safe blasting. Investigate the possibility of electronic initiation. Monitoring of blasting operations.	Monthly or per every blast		Blast monitoring programme and structural survey pre-mining	Construction phase	Environmental officer	R 15 000
		Biodiversity & Aquatic Environment	Removal of vegetation during boxcut construction will reduce available areas for plant recruitment.	Removal of vegetation during stripping and construction will be minimised to reduce the erosion potential. Topsoil will only be removed off areas proposed for immediate mining or construction as in accordance to the conceptual mine plan	Ongoing	NEMA	Rehabilitation plan	Construction phase	Mining engineer	R 15 000
			All construction activities will be planned and managed to ensure that there will be a minimal reduction in catchment size.	Keep footprint area as minimal as possible. Vegetate all stockpiles . Minimise vegetation removal.	On going	NWA	Rehabilitation plan	Construction phase	Mining engineer	R 25 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Visual	Reduce the visual impact caused by transportation.	Dirt roads need to be wet by a water browser so as to reduce dust plumes.	As and when required		Ambient air quality standard operating procedure including monitoring plan	LoM	Environmental officer	
7	Temporary waste management	Surface Water	Prevention of contamination of surface water	Storage facilities with bunding must be constructed. An emergency spillage protocol must be developed and accessible. It will be ensure proper servicing and maintenance of the potable ablution facilities is undertaken	Continuous		Waste water management plan/procedure	Construction phase	Environmental coordinator	R 30 000
		Biodiversity & Aquatic Environment	Avoid impacts to water quality and wetland functioning through spillages and leakages.	A waste water management system will be introduced on site to ensure that potential pollution of the water resource will be minimised. The storage of materials and substances will be housed in suitable facilities.	Weekly	NEMA	Waste water management plan	LoM	Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
8	Employment	Socio-economic	Empower the workforce to develop skills that will equip them to obtain employment in other sectors of the economy. Contribute to the sustainable development of a community (not dependent on the mine) surrounding the area of operation	Ensure skills training continues, increase employment where possible, employ local companies and contractors, and liaise with the local community development officers.	Ongoing	SLP	The social plans to involve action plans aimed at providing development opportunities and benefits to the affected local communities.	LoM	HR manager	N/A
9	Topsoil and overburden removal and stockpiling	Soil	To preserve integrity of soil	Ensure all activities occur within designated areas. Compile accurate soil map showing classification, thickness, fertility status. Remove and stockpile topsoil in berms or heaps less than 2 – 3 m high. Do not use as storm water control feature. Vegetate with diverse grass mix to control erosion. Wetland soils should only be stockpiled at heights of 1 – 2 m. Subsoil stockpiles can be bigger but must be protected against erosion similar to topsoil stockpiles	Ongoing		Rehabilitation plan including soil management component. Contractors operating EMP	LoM	Mining engineer , Environmental officer	R 150 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Surface Water	Prevention of contamination of surface water bodies	Siltation of surface water resources will be minimized by road wetting. The areas excavated should be have berms that are vegetated in order to separate dirty and clean water systems while enhancing the maximization of clean and minimization of dirty areas and water systems respectively, and as an erosion control measure. The stockpiles must be vegetated to prevent erosion and subsequent siltation of clean and dirty water streams as well as surface water resources. Upslope diversion and down slope silt containment structures will be constructed. Monitoring of surface water resource pre-mining and during construction must be implemented in order to be used during operation, decommissioning and post-closure as per the monitoring programme.	Continuous	NWA, DWAF BPG	Surface water monitoring programme	LoM	Environmental officer	R 15 000
		Air Quality	Reduction of dust fallout levels and particulate matter	Vegetation needs to be encouraged on all soil stockpiles to reduce dust levels.	Continuous	NEMAQA	Ambient air quality standard operating procedure including monitoring programme	LoM	Environmental officer	R 17 000
		Noise	To prevent the noise emanating from the construction machinery from impacting on the sensitive receptors	As per mitigation for activity 4	Ongoing	NEMAQA , ECA	Noise monitoring programme	LoM	Environmental officer	



No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Biodiversity & Aquatic Environment	Limit erosion of exposed areas and stockpiles.	Keep the footprint of the disturbed area to the minimum and designated areas only. Vegetate and wet stockpiles to limit erosion. Berms created below the piles to trap particles and runoff from the stockpile	As and when required	NEMA	Storm water management plan	Construction and operation	Environmental officer	R 43 000
			Limit erosion of exposed areas and stockpiles as well as sediment load reporting to wetlands	Keep the footprint of the disturbed area to the minimum and designated areas only. Vegetate and wet stockpiles to limit erosion. Berms created below the piles to trap particles and runoff from the stockpile	As and when required	NWA	Rehabilitation plan	Construction, operational phases	Environmental as and when required	
			Limit reduction in the re-charge of aquifers	Removal of vegetation during stripping and dump operation will be minimised to reduce the risk of the aquifers being drained and not properly recharged.						
		Visual	Reduce the visual impact of topsoil, overburden and discard dumps	Where possible stockpiles and overburden dumps should be kept as low as possible, rather make the dumps longer than higher. Establish vegetation where possible	On going		Rehabilitation plan	Operational and decommissioning phase	Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
10	Drilling and blasting of hard overburden	Air Quality	Reduction of dust fallout levels and particulate matter	Dust fall out during blasting will need to be monitored. Monitoring weather conditions when blasting especially during the dry season will minimize the impact of the dust cloud formed from an air blast, by allowing the contractor to know whether the conditions are favorable to perform a blast. The limit value for the 24 hour average for PM10 is 75 ug/m3 and this may not be exceeded 4 times within a year. The limit value for the yearly average for PM10 is 40ug/m3	During blasting		Ambient air quality standard operating procedure including monitoring plan	Operational phase	Environmental officer	
		Noise	To prevent the noise emanating from the blasting from impacting on the sensitive receptors	As for the blasting operations it is generally intermittent and should be limited to daylight hours when ambient noise levels are highest. The following with regards to blasting operations is recommended: The use of millisecond delays between rows of blast holes in a given blasting pattern in order to reduce the amount of explosive charge detonated at any given instant is recommended (Sengupta, M.1993); Reduction of the powder factor, that is, use of less explosive per cubic yard of overburden; Restriction of blasting to daylight hours are mitigation measures that should be followed (Sengupta, M.1993); and Areas to be clearly demarcated and signs to be erected indicating blasting zones	Before blasting	NEMAQA , ECA	Noise monitoring programme, contractors operational EMP	Operational phase	Environmental officer	R 39 000

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Air Blasting and Ground Vibration	Reduction of disturbance to neighbouring activities	Pre blast survey of all structures identified surrounding the mining area. Ground vibration survey in the form of signature trace study to be done for determination of ground vibration constants that can be used for accurate prediction of ground vibration. Redesign with alternative diameter blast holes and charge masses to accomplish safe blasting. Investigate the possibility of electronic initiation. Monitoring of blasting operations.	Pre blast survey – once off  Monthly		Blast monitoring programme and structural survey pre-mining	Construction phase	Environmental officer	
11	Coal removal and stockpiling	Geology	To minimise impacts on geology	Limited mitigation is available - comply to the mine plan	Ongoing		N/A	LoM	Mining engineer and Environmental officer	N/A
		Groundwater	-	No mitigation possible	-	-	-	-	-	
12	Vehicular activity on haul roads	Soil	Reduction of areas of soil compaction	All vehicles must remain on haul roads and within in demarcated areas	Ongoing		Contractors operating EMP	LoM	Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
	and conveying of coal	Air Quality	Reduction of dust fallout levels and particulate matter	<p>Road surfaces, for example the access road, will be sprayed and treated with water and a dust binding agent. Water will be applied to haul roads three times daily, except during periods of rainfall. All coal haul trucks must be covered. The overland conveyor belt will also be covered and where coal on the conveyor will be sprayed to reduce emissions.</p> <p>The limit value for the 24 hour average for PM10 is 75 ug/m3 and this may not be exceeded 4 times within a year. The limit value for the yearly average for PM10 is 40ug/m3.</p>	As and when required	NEMAQA	Ambient air quality standard operating procedure, contractors operating EMP	LoM	Environmental officer	R23 000
		Biodiversity & Aquatic Environment	Prevent excess dust creation, that could inhibit plant growth	Wetting of the haul road to suppress dust creation as well as cover haul trucks to prevent dust emissions during transport. The overland conveyor belt will also be covered and where coal on the conveyor will be sprayed to reduce emissions.	As and when required	NEMA	Ambient air quality standard operating procedure	Operational phase	Environmental officer	
			Prevent siltation of the wetland units from coal and natural dust from the haul road and from the use of trucks	Wetting of the haul road to suppress dust creation as well as cover haul trucks to prevent dust emissions during transport. The overland conveyor belt will also be covered and where coal on the conveyor will be sprayed to reduce emissions. Implement the necessary emergency response systems such as a pull wire or roll back prevention mechanism to avoid spillages from the conveyor system.	As and when required	NWA	Rehabilitation plan, Ambient air quality standard operating procedure, Contractors operational EMP	Operational phase	Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Noise	Minimise noise as far as possible along the roads	Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installing exhaust mufflers. Noisy machinery to be used during daylight hours preferably. Grievance mechanism to record complaints should be kept on site and investigated. Noise monitoring to take place.	Ongoing. Monitoring to be weekly.	NEMAQA , ECA	Noise monitoring programme to be followed. Vehicle maintenance plan. Contractors operating EMP	LoM	Environmental As and when required, contractor or manager	
		Traffic & safety	Ensure safety on road network	Speed limits must be implemented on site as well as safety controls. Investigations into the requirement of safety intersections must be undertaken	Continuous			LoM	Safety officer	
13	Water use around site	Surface Water	Maximise reuse of water	All dirty water must be captured and recycling of water must be emphasized and implemented throughout the mine	Continues	NWA	Waste water management plan/procedure	LoM	Environmental As and when required	R25 000
		Aquatic Environment	Limit the use of water from aquifers	A water management plan will be implemented to prioritise the recycling of water and use of rain (storage) water. Maintain the clean water storage dam to ensure there are no losses.	On going	NWA	Water monitoring programme	Operational phase	Environmental officer	
			Avoid impacts to water quality from dirty water	A dirty water management system will be introduced on site to ensure that potential pollution of the water resource will be minimised						

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
14	Screening	Surface Water	Prevention of contamination of surface water	The plant must be constructed on an impermeable compacted surface and all waste water resulting from the process must be collected and reused. All runoff from the plant area must be collected and treated as dirty water.	Continuous	NWA	Waste water management plan	Operational phase	Environmental officer	R32 000
		Noise	To prevent the noise emanating from washing plant from impacting on the sensitive receptors	Optimum location of plant, away from nearest sensitive receptors. Noise barriers in the form of screens (trees, etc) to be installed at various positions around the wash plant.	Ongoing through operational phase	NEMAQA , ECA	Noise monitoring programme	Operational phase	Environmental officer	
15	Pollution control dams	Surface Water	Prevention of contamination of surface water	Water pollution control dams needs to be well designed and properly maintained to prevent any leakages or spillages into dirty water into clean water systems. The operation of the PCDs on site will be undertaken in accordance with the requirements of the DWAF: Best Practice Guideline A4: Pollution Control Dams (August 2007). Recycled water will be diluted if required to meet the quality and quantity demands. All applicable DWAF Best Practice Guidelines for water management must be complied with and in particular, the DWAF: Best Practice Guideline H3: Water Reuse and Reclamation (June 2006).	Monthly	NWA, DWAF BPG	Waste water management plan	Operational phase and decommissioning phase	Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Wetlands	Avoid impacts to water quality from spillages and leakages.	Continuous maintenance and inspection of the infrastructure as part of the water management programme.	On going	NWA	Water monitoring programme	Operational phase	Environmental officer	
16	Concurrent replacement of overburden and topsoil and revegetation	Topography	Ensure overburden is placed in a manner to restore a functioning topography	The replacement of overburden and top soil should be replaced so it follows the original contouring of the land prior to mining. The area would need to be revegetated to decrease the risk of erosion.	Monthly		Rehabilitation plan	Operation and decommissioning phase	Mining engineer	
		Soil	To ensure soil profile can sustain vegetation	Restore overburden to recreate slope form and topsoil with optimal fertilisation based on soil analysis. Ensure monitoring and remediate if necessary soil fertility, soil acidity and depths	Ongoing		Rehabilitation plan	Operation and decommissioning phase	Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Surface Water	Prevention of contamination of surface water	<p>When designing and mining opencast areas, the final decant point will, as far as possible, be kept above the level of spoil replacement. This is done in an effort to ensure that replaced spoils are completely flooded when groundwater levels recover to reduce the contact of spoils with air in an effort to reduce oxidation. During rehabilitation, the contouring of the surface will be such as to avoid ponding of water on rehabilitated surface to reduce the infiltration of water into areas where spoils have been replaced and which are prone to AMD.</p> <p>Water entering the pit during the operational phase should be pumped out as rapidly as possible to minimize its contact with AMD generating material. This water should be re used on site, or discharged if quality is such that it meets discharge permit conditions. All applicable DWAF Best Practice Guidelines for surface water management must be complied with and in particular Water management measures should be undertaken in accordance with the requirements of the DWAF: Best Practice Guideline A5: Water Management for Surface Mines (July 2008).</p>	Ongoing		Rehabilitation plan	Operational and decommissioning phase	Environmental officer	
		Air Quality	Reduction of dust fallout levels and particulate matter	When backfilling during earthmoving operations, dedicate a water truck or large hose to backfilling	On going	NEMAQA	Ambient air quality operating	Operational phase	Environmental officer	



No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
				equipment and operations and apply water as needed; or, cover or enclose stationary backfill material; if needed, mix backfill soil with water prior to moving. Empty loaders buckets slowly and minimize their drop heights. Immediately after backfilling, apply soil stabilization compounds to form a crust. The limit value for the 24 hour average for PM10 is 75 ug/m3 and this may not be exceeded 4 times within a year. The limit value for the yearly average for PM10 is 40ug/m3			procedure and contractors EMP			
		Noise	To prevent the noise emanating from the construction machinery from impacting on the sensitive receptors	As per mitigation for activity 4	Ongoing	NEMAQA , ECA	Noise monitoring plan, Contractors EMP	Operational phase	Environmental coordinator	
		Biodiversity & Aquatic Environment	Reduce areas available for alien infestation	The footprint of the area disturbed by the mining operation will have natural vegetation restored.	On going	CARA	Alien invasive monitoring and control programme	Operation and decommissioning phase	Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
			Limit the erosion potential of exposed areas	Once overburden and topsoil has been placed on the area seeding must be undertaken as soon as possible where required, with grasses such as a standard seed-mix. Any alien invasive species that establish themselves in rehabilitated areas must be removed. If compaction of the areas occurs they must be ripped to encourage plant growth. Rehabilitated areas must be monitored and maintaining to prevent soil erosion as stipulated in the rehabilitation plan that is compiled as part of the closure plan for the mine.	On going	NEMA	Alien vegetation Monitoring plans			
			Restore water infiltration, and reduce surface water runoff	Re-vegetated areas will form seepage areas which will help aid infiltration. Restore of wetland areas and low gradient rehabilitation to create seepage units.						
			Restore the size of the impacted/disturbed catchment area	The footprint of the area disturbed by the mining operation will have topsoil and overburden replaced to restore the total catchment area.	On going	NWA	Rehabilitation to represent original contours and topography as per the Rehabilitation and Closure Plan	Operational phase	Environmental officer	
			Restoration of sub-surface flow dynamics	The soil profile will be replaced to represent the original make-up and structure.			Rehabilitation plan			

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
			Restore the re-charge potential of aquifers	Re-vegetated areas will form seepage areas which will help to re-charge aquifers. The soil profile will be replaced to represent the original make-up and structure. Exposed areas will be revegetated which will help with the recharge of the aquifer.			Restore of wetland areas and low gradient rehabilitation to create seepage units			
17	Retrenchment	Socio-Economic	Ensure that decommissioning and retrenchments take place in a legally compliant and human manner	The LED plan should be implemented to assist local business development. The workforce should be empowered to develop skills that will equip them to obtain employment in other sectors of the economy	Ongoing		The social plans to involve action plans aimed at providing development opportunities and benefits to the affected local communities.	Operation and decommissioning phase	HR Manager	
18	Final replacement of overburden and topsoil revegetation	Topography	Ensure overburden is placed in a manner to restore a functioning topography.	The replacement of overburden and top soil should be replaced so it follows the original contouring of the land prior to mining. The area would need to be revegetated to decrease the risk of erosion.	Monthly		Rehabilitation plan	Operation and decommissioning phase	Mining engineer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Soil	To achieve determined post mining land capability	Scarify roads and stockpile areas to a depth of 500mm and infrastructure areas and restore topsoil cover. Implement soil conservation measures. Integrate disturbed area to most appropriate land use to ensure long-term stability of restored topsoil. Rehabilitation must ensure long-term stability and not compromise post-mining land use objectives.	Ongoing		Rehabilitation plan	Decommissioning and post closure phase	Mining engineer , environmental officer	
		Surface Water	Prevention of contamination of surface water	The filling of the void must be controlled to maintain the correct slopes so as to prevent the alteration of a free drainage system, where there was initially a natural drainage line. The water from the PCD should be either re-cycled for stored for evaporation, or treated to levels that can be discharged to a municipal system or nearby rivers (this must be a registered water activity). Decommissioning activities must be conducted in accordance with DWAF best Practice Guidelines: A5 Water Management Aspects for Mine Closure (December 2008). The final decant point must be at level higher than the level of spoil replacement. Decant water to be contained.	Ongoing	NWA, DWAF BPG	Rehabilitation plan	Decommissioning and post closure phase	Mining engineer and Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Air Quality	Reduction of dust fallout levels and particulate matter	When filling of final void , dedicate a water truck or large hose the filling equipment and operations and apply water as needed; or, cover or enclose stationary backfill material; if needed, mix backfill soil with water prior to moving. Empty loader buckets slowly and minimize their drop heights. Immediately after backfilling, apply soil stabilization compounds to form a crust. The limit value for the 24 hour average for PM10 is 75 ug/m3 and this may not be exceeded 4 times within a year. The limit value for the yearly average for PM10 is 40ug/m	On going	NEMAQA	Ambient air standard operating procedure, Contractors Operational EMP	Decommissioning phase	Environmental officer	
		Noise	To prevent the noise emanating from the machinery from impacting on the sensitive receptors	Limiting activities to daylight hours. Mining-related machine and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installing exhaust mufflers. Switching off equipment when not in use.	Ongoing through decommissioning phase	NEMAQA , ECA	Noise monitoring programme	Decommissioning and post closure phase	Environmental officer	
		Biodiversity & Aquatic environment	Restore natural vegetation	The footprint of the area disturbed by the mining operation will have topsoil and overburden replaced to restore the vegetation cover. The areas that have been rehabilitated should be protected from further disturbances. Fences should be erected around certain areas that need extra protection	On going	NEMA	Rehabilitation plan	Decommissioning phase	Mining engineer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
			Limit the erosion potential of exposed areas.	Once overburden and topsoil has been placed on the area seeding must be undertaken as soon as possible, where required with grasses such as A standard seed-mix is 5 kg/ha of Smuts finger grass ( <i>Digitaria eriantha</i> ), 5 kg/ha of Rhodes grass ( <i>Chloris gayana</i> ) and 5 kg/ha of teff ( <i>Eragrostis tef</i> ). A second option is 10 kg/ha of love grass ( <i>Eragrostis curvula</i> ) and 5 kg/ha of teff. Any alien invasive species that establish themselves in rehabilitated areas must be removed. If compaction of the areas occur they must be ripped to encourage plant growth. Rehabilitated areas must be monitored and maintained to prevent soil erosion as stipulated in the rehabilitation plan that is compiled as part of the closure plan for the mine.	Weekly		Storm water management plan & monitoring plans		Environmental officer	
			Restore the size of the impacted/disturbed catchment area	The footprint of the area disturbed by the mining operation will have topsoil and overburden replaced to restore the total catchment area.						
			Restoration of sub-surface flow dynamics	The footprint of the area disturbed by the mining operation will have topsoil and overburden replaced to restore the total catchment area. The soil profile will be replaced to represent the original make-up and structure. Exposed areas will be vegetated. Monitoring to take place to determine level of rehabilitation.	On going	NWA	Rehabilitation plan	Decommissioning phase	Environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
		Visual	Reduce the visual impact	Overburden and topsoil should be replaced following the original topography of the site prior to mining. Re-establish vegetation where possible.	On going		Post closure rehabilitation plan	Decommissioning Phase	Environmental officer	
19	Post closure monitoring and rehabilitation	Soil, Surface Water, Biodiversity and Wetlands	Ensure that the area is not a source of pollution after closure of the mine.	<p>Woody vegetation should be established to minimize water ingress into the discard will be applied. It is essential that the coal discard dump be placed, shaped and compacted as part of concurrent operations. Soil will be required to cover the discard dump. The quantities of soil required as well as the timing of the operation will depend on the design and operation of these facilities.</p> <p>Surface water runoff controls will be engineered to prevent future soil erosion of the rehabilitated area. Revegetation will assist in controlling erosion by wind and water. Monitoring will be ongoing for 3years to determine potential water contamination. For the first year monitoring should be undertaken quarterly and from the results it can be determined if quarterly monitoring is required or bi-annual monitoring will be sufficient. After three years it will be assessed if further monitoring is required.</p>	Ongoing for 5 years post mining or longer if required	NWA	Rehabilitation and Closure Plan	Decommissioning and post closure phase	Mining engineer , environmental officer	

No	Activity	Affected Environment	Objectives	Mitigation/Management measure	Frequency of mitigation	Legal Requirements	Recommended Action Plans	Timing of implementation	Responsible Person	Management Cost
20	Post closure monitoring and rehabilitation	Soil, Surface Water, Biodiversity and Wetlands	Establishment of post mining land capability and ensure post mining land use fits the capability	Analyse soils, treat to ameliorate salinity or contamination and dispose of untreatable soil at an approved disposal site. Restore overburden to recreate slope form and topsoil with optimal fertilisation based on soil analysis. Implement soil conservation measures. Integrate available land with activities in adjacent areas. Rehabilitation must ensure long-term stability and not compromise post-mining land use objectives. Take into account developments in surrounding areas and design post-mining land use options to support and enhance long-term development options. Ongoing monitoring to establish status of environment post closure	Ongoing for 5 years post mining or longer if required	NWA	Rehabilitation and closure plan	Decommissioning and post closure phase	Mining engineer , environmental officer	R 30 000
<b>TOTAL AMOUNT</b>										<b>R 896 161.00</b>



## Financial Provision

### (1) Determination of the amount of Financial Provision.

**(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.**

Environmental risk or Issue	Objective or requirement	Control measure
<b>Storm water control</b>	To prevent and restrict siltation and groundwater pollution	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> to ensure that no harm to the receiving environment occurs. To comply with the provision of government notice 704 and not reduce the sub catchment yield.</li> <li>❖ <b>Management Criteria:</b> <ul style="list-style-type: none"> <li>❖ All clean water collected as runoff from areas up gradient of the mining sites should be separated from the sites by means of berms to divert clean water to the surrounding areas, to allow natural runoff into the nearby stream.</li> <li>❖ The mining site will be considered a dirty area and demarcated as such.</li> </ul> </li> </ul>
<b>Soils</b>	Contamination of soils	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To prevent contamination of soils.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ All topsoil is to be removed from the site prior to stockpiling.</li> <li>❖ Any contamination of soils should be suitably handled by an appropriately trained person.</li> <li>❖ Should soils be contaminated in such a way as to lead it being classified as waste, it should be disposed of at a suitable disposal site</li> </ul> </li> </ul>
	Erosion and siltation	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> to prevent unnecessary loss of soil through bad management.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ All surface run-off shall be managed in such a way so as to ensure erosion of soil does not occur.</li> <li>❖ All surfaces that are susceptible to erosion, shall be protected either by cladding with biodegradable material or to layer of soil being seeded with grass seeded/planted with suitable groundcover.</li> <li>❖ The applicant should adhere to the requirements of the Department of Agriculture in the design of effective erosion control measures on bare soils.</li> </ul> </li> </ul>

	Conserving topsoil	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To prevent loss of valuable topsoil.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ The top layer of all areas to be excavated for the purpose of mining must be tripped and stockpiled , in areas where this material will not be damaged, removed or compacted. This stockpiled material shall be used for the rehabilitation of the site upon completion sampling in areas as deemed necessary.</li> <li>❖ When stripping of topsoil takes place, the grass component shall be included in the stripped topsoil. This soil will contain a natural grass seed mixture that may assist in the re-growth of grass once the soil is used for back filling and rehabilitation.</li> </ul> </li> </ul>
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<b>Environmental risk or Issue</b>	<b>Objective or requirement</b>	<b>Control measure</b>
<b>Hydrology</b>	Surface water: To prevent contamination of water courses	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To prevent contamination of streams by mining activities.</li> <li>❖ <b>Management Criteria:</b> <ul style="list-style-type: none"> <li>❖ All streams should be monitored before the mining activities commence.</li> <li>❖ There will be no clearing of vegetation or stripping of soils until clean-water diversions (for diversions of runoff from upstream catchment) and dirty water collection facilities has been established</li> <li>❖ There shall be environmental conditions included in the contractual agreement to make successful miner of the necessity to prevent accidental spillages by the implementation of good housekeeping practices.</li> </ul> </li> </ul>
	Prevent the pollution of groundwater	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To ensure groundwater is not polluted by the mining activities – particularly in areas were groundwater is generally shallow.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ Chemical toilets and mining activities that may cause negative impact on ground water quality must be suitably managed and monitored.</li> <li>❖ No waste material shall at any stage be disposed of on site. All solid waste must be removed and transported to a recognised waste disposed site by suitably qualified service provider (contractor).</li> </ul> </li> </ul>

<b>Land use</b>	Minimise the impact on land use to areas specifically used for mining activities.	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To minimise impact on land use areas demarcated as mining sites.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ All drinking activities are to take place within the designated footprint areas as per mining standard.</li> </ul> </li> </ul>
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<b>Environmental risk or Issue</b>	<b>Objective or requirement</b>	<b>Control measure</b>
<b>Floral and Fauna biodiversity and Ecological functioning</b>	To ensure that the mining activities pose no significant harm to the surrounding areas as well as any sensitive species of fauna and flora – if present.	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To ensure that no loss of ecological function of the surrounding areas occurs due to mining activities.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ All activities associated to the mining activities should occur within their designated areas and there should not be encroachment into the surrounding areas.</li> <li>❖ Any areas to be rehabilitated shall be rehabilitated with no-invasive species</li> </ul> </li> </ul>
	Prevent the invasion of the areas with invasive species	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To eradicate all invasive alien plants.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ Invasive alien species shall be eradicated as part of the rehabilitation programme.</li> <li>❖ All alien species should be removed prior to flowering season of the relevant species.</li> </ul> </li> </ul>
	To retain the floral and fauna assets on site	<ul style="list-style-type: none"> <li>❖ No floral assets of conservation concern were identified which need to relocate or left in situ.</li> </ul>
	To promote vegetation establishment and to prevent erosion.	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To promote vegetation establishment and prevent erosion.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ A rehabilitation process needs to determined prior to commencing mining activities – to ensure concurrent rehabilitation.</li> </ul> </li> </ul>
<b>Land Capability</b>	None	<ul style="list-style-type: none"> <li>❖ No management of impacts on and capability can be implemented since the proposed project activities will not degrade the land based on their meagre impacts from a land capability perspective.</li> </ul>
<b>Social Impact</b>	Air Quality	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To limit public and staff exposure to unnecessary dust.</li> <li>❖ <b>Management criteria:</b></li> </ul>

		<ul style="list-style-type: none"> <li>❖ Dust pollution could occur during both initial stages of mining each boxcut - especially during the dry months. Regular and effective damping down must be carried out to avoid dust generation that will have a negative impact on the surrounding environment. Dumping should happen in the morning and afternoon unless it rains.</li> <li>❖ Dust monitoring to evaluate the efficiency of damping process or dust suppression shall take place.</li> </ul>
	Noise Impact	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To prevent Public and staff exposure to noise.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ Mining crew(s) should comply with the DMR and provincial noise requirements</li> <li>❖ All equipment shall be subject to routine maintenance, which will include the checking of noise decibels or emissions.</li> <li>❖ Personnel will be trained in techniques to reduce noise during operation of equipment</li> <li>❖ The applicant will record and respond without delay to complaints about disturbing noise.</li> <li>❖ The applicant should employ an open door policy with the landowners, nearby farmers and any other affected parties regarding issues that impact upon them.</li> </ul> </li> </ul>
<b>Environmental risk or Issue</b>	<b>Objective or requirement</b>	<b>Control measure</b>
<b>Waste Management</b>	To avoid, reuse or recycle material where possible, correctly dispose of unusable waste(s) and do not generate pollution	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> Comply with existing good waste management practices in terms of NEMA principles.</li> <li>❖ <b>Management Criteria:</b> <ul style="list-style-type: none"> <li>❖ Contain all waste within designated dirty areas of development – that is, mining sites.</li> <li>❖ Ensure waste storage area does not generate pollution</li> <li>❖ Cover any wastes that are likely to wash away or contaminate storm water.</li> </ul> </li> </ul>
<b>Archaeological and cultural interest</b>	Sites of archaeological and cultural interest	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To avoid disturbing sites of archaeological and cultural interest</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ If archaeological and cultural materials are recognised during mining, protocol according to SAHRA requirements will be followed.</li> </ul> </li> </ul>
	Graves	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To avoid disturbing burial sites.</li> <li>❖ <b>Management criteria:</b></li> </ul>

		<ul style="list-style-type: none"> <li>❖ No graves were identified on the proposed project site.</li> </ul>
<b>Sensitive Landscapes</b>	Nature conservation or ecological sensitive areas	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> Conservation of ecologically sensitive areas.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ There are no sensitive areas on the proposed mining project site.</li> </ul> </li> </ul>
<b>Regional Socio-Economic Structure</b>	Socio-economic benefits of the project	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To eventually enhance the socio-economic benefits, and create job opportunities for locals.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ No regional socio-economic benefits are foreseen at mining phase since there shall not be any profit generation.</li> </ul> </li> </ul>
<b>Interested and Affected Parties</b>	To ensure that all stakeholders are informed and aware about the proposed mining project	<ul style="list-style-type: none"> <li>❖ <b>Management Objective:</b> To inform all interested and affected parties about the proposed mining project as the need may arise.</li> <li>❖ <b>Management criteria:</b> <ul style="list-style-type: none"> <li>❖ The applicant should ensure that all communication channels are available in order for interested and affected parties to voice opinions or raise concerns</li> <li>❖ The applicant should strive to develop a relationship of trust and credibility with interested and affected parties.</li> <li>❖ The applicant should ensure that all information is shared and correspondence with I&amp;APs is fully and accurately documented.</li> </ul> </li> </ul>

**(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.**

This Basic Assessment Report and Environmental Management Plan will be made available to each registered stakeholder for review and comment. All comments will be captured in the issues and response and will be included into the report.

**(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.**

Rehabilitation of the mine has become an important consideration for government bodies, the general public and mining companies. The development of detail environmental legislation has largely reflected public and in turn government concern that mined sites retain at least a pre mining land capability and that environmental degradation be repaired. Mine design and scheduling assists in determining every activity associated with the proposed project. In that, it is critical to understand the setup of the mining activities to ensure that con current rehabilitation is practical and possible.

#### Site Clearing – Topsoil, subsoil and overburden.(2 months)

Concurrent rehabilitation commences with handling the topsoil, subsoil and overburden material within the proposed area. Handling of soil material plays a critical role when conducting concurrent rehabilitation. In that, the quantity of the soil material must be known as well as the area required for storage. This is a key factor in handling the soil material since mining contractor will be shown the location appropriate for storage and possible quantities expected. According to the survey conducted on the proposed area an area of 0.47ha will be required to accommodate the volume of 62 774<sup>m</sup> of both topsoil and overburden(refer to mining layout). The management of soil material during mining is important to ensure that the chemical and physical properties are maintained.

#### Initial boxcut(3-5 months)

The proposed mining operation will commence on the western side of the property. Topsoil, subsoil and overburden will be placed adjacent to the boxcut as illustrated on the mining layout. Three cuts will be required as well as the sequential of replacing the soil material. The proposed mining operation will follow the same route depicted in this document to ensure proper concurrent rehabilitation.

#### Operational Phase(6-8 months)

Following the initial boxcut, no overburden and/or any soil material will be send for storage on the mining area. Hard overburden – sandstone will be placed at the buttom of the initial boxcut and grit parting will then follow.

#### Final void(4-7 months)

The overburden stockpile which was stored when developing the initial boxcut will be utilised to backfill the final void. The material will be loaded into the trucks and discharged into the pit. The final void is the only risk in terms of environmental liability to the Department of Mineral Resources. On the completion of filling the void, the surface(i.e. overburden and R.O.M stockpile areas) will be scrapped of any coal material and commence with revegetation. During this phase all infrastructure on site will be removed and every surface cleaned.

#### **(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.**

Due to the nature of the activities, the impacts will be very limited and of short duration. The management plan is provided in such a manner as to ensure concurrent rehabilitation. The areas f or drilling purposes will be the main area experiencing impacts. In this event the activities will be temporary in nature, and a detailed management plan has been provided to address potential impacts associated with these activities.

- (e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

R869 161.00

**(f) Confirm that the financial provision will be provided as determined.**

It is hereby undertaken that the amount of **R 869 161.00** in the form of a bank guarantee for rehabilitation purposes as required in terms of section 24P of the Act: Financial provision for remediation of environmental damage.

**Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including**

**g) Monitoring of Impact Management Actions**

**h) Monitoring and reporting frequency**

High level monitoring:

Bi-annual performance assessment must be conducted in line with the MPRDA (Regulation 55).  
Establish a structured system of internal and external communication of incidents.  
Any changes to the approved EMP which have an impact on interested and affected parties to be communicated to them and the EMP amended accordingly.  
Complaints register to be established and kept up to date.  
Interested and affected parties concerns to be incorporated into the project implementation.

Operational Level monitoring:

On a weekly basis all registers, procedures and records are checked against the prescripts of the EMP. Corrective action must be taken in cases of transgress where necessary.  
Internal audits to be conducted by an environmentalist when deemed necessary.  
Employees assigned to specific tasks.  
Should the mitigation measure not be in line with the prescripts, amendments will be made and the employees will be made aware of the changes and encouraged to adhere to such.

On monthly basis, all site personnel will be inducted at the site and will be taken through the EMP and other relevant legal requirements to familiarize them with same.

Simplified signalling will be placed on site to sensitize the workers of the legal requirements attached to this EMP.

**i) Responsible persons**

The Site Manager is responsible for oversight of all EMP requirements. He/she may appoint an assistant to conduct internal monitoring of activities.

The latter will be responsible for the monitoring of day-to-day activities related to the mining process and report any environmental incidents to the Site Manager as per procedure to be established by both parties.



Communication lines will be drawn and will cascade from the Site Manager through to the general workers.

**(j) Time period for implementing impact management actions**

<b>In cases where a need for monitoring has been identified provide detail below. (Explain what will be monitored, how it will be monitored, by whom it will be monitored, and how frequently it will be monitored).</b>			
Action	Frequency	Method	Period
Monitoring of perimeter fence if constructed	Daily and weekly for any signs of unauthorized access	Foot or vehicle patrol	Ongoing until closure
Monitoring of vegetation	Weekly for any signs of abuse or damage (by workers on site)	Foot inspections	Ongoing until closure
Monitoring of erosion	Weekly and following any heavy rainfall	Visual inspections Walks-about Photographic records	Ongoing until closure
Monitoring of alien plants	Seasonally	Visual inspections on foot. Mapping of affected areas – GPS coordinates Eradication plan	Ongoing until closure
Monitoring of all cleared and re-vegetated areas – check progress with vegetation cover and provide remedial action if not successful	Monthly	Survey – map new rehabilitated areas Plot on plan and estimate area treated.	Ongoing until closure
Monitoring of maintenance of general waste disposal (domestic only)	All waste to be collected in designated receptacles	Weekly disposal of waste	Until closure
Monitoring of condition of equipment	Daily & regularly	Visual methods & Regular service	Until closure

**(k) Mechanism for monitoring compliance**

Monitoring	Locations	Standards and/or legislative requirements	Description of the analysis to be conducted and the records to be kept
Soil Monitoring	Progressive monitoring of the stripping, stockpiling, shaping of spoil surfaces and replacing of topsoil	Mine rehabilitation plan	<p>Progressive monitoring should take place on at least a quarterly basis and should involve the following;</p> <p>Inspection of stripping depths;</p> <p>Inspection of stockpiles to check degradation and or pollution;</p> <p>Inspection of spoil surfaces before replacing soil to ensure that pre mined topography is emulated;</p> <p>Random inspection of soil thickness on rehabilitated sections;</p> <p>Fertility analysis and amelioration procedures prior to re-vegetation; and</p> <p>Evaluating and readjusting the rehabilitation plan.</p>
Air Quality - Dust monitoring (dust buckets)	Four monitoring points will be placed around the mining operation	National Environment Management: Air Quality Act (Act No. 39 of 2004) (NEM: AQA).	<p>For the single dust fallout samplers, the buckets are filled with distilled water and left out on site for a period of 30 days (+/- 3 days); according to SANS:1929; from there the buckets will be transported to a reputable Laboratory for analysis.</p> <p>The air quality monitoring programme should initiate as soon as construction commences. The</p>

Monitoring	Locations	Standards and/or legislative requirements	Description of the analysis to be conducted and the records to be kept
			<p>buckets should be changed on a monthly basis and the filters of the permanent PM10 sampler should be changed daily. The permanent PM10 sampler will need to be near a power source. The permanent PM10 sampler will sample the ambient PM10 levels on a continuous basis throughout life of mine.</p> <p>Incident reports will be submitted to the mine as well as to the relevant competent authority upon receipt of results exceedances. In case of no exceedance this will be confirmed.</p>
<p>Baseline noise monitoring is to be conducted on a monthly basis for the first 3 months to determine the impact of the noise levels on the relevant receptors as well as determine the level of mitigation. Once it is established that the mitigation measures have decreased the specific noise levels from the mining activities, the noise monitoring should be carried out on a quarterly basis thereafter.</p>	<p>In accordance with the Mining Plan</p>	<p>The approach used in investigating noise impacts is based on guidelines provided by the South African National Standards (SANS). The following legislation was considered for this survey:</p> <ul style="list-style-type: none"> <li>▪ The National Environmental Management Act (Act 107 of 1998), NEMA;</li> <li>▪ The National Environmental Management Air Quality Act (Act 39 of 2004), NEMAQA; and</li> <li>▪ The Environment Conservation Act, 1989 (Act 73 of 1989).</li> </ul>	<p>At each measurement point the ambient noise level will be sampled in terms of the following parameters:</p> <p>The A-weighted equivalent sound pressure level (LAeq) for duration not less than 30 minutes per monitoring point.</p> <p>Measurements to be taken during both daytime (06:00 to 22:00) and the night time (22:00 to 06:00).</p> <p>A report must be compiled monthly/quarterly, depending on the intervals of the monitoring programme then submitted to management to ascertain compliance with the required standards.</p>

<b>Monitoring</b>	<b>Locations</b>	<b>Standards and/or legislative requirements</b>	<b>Description of the analysis to be conducted and the records to be kept</b>
<p>Surface Water - Surface water monitoring (samples from monitoring points)</p> <p>Sampling will be conducted on a monthly basis during the first year to establish seasonal trends; and</p> <p>After the first year of mining, sampling will be conducted quarterly.</p>	<p>Surface water monitoring will be done at strategic locations as follows:-</p> <p>Downstream of possible sources of pollution e.g. downstream of the decant points of both the North and South pits;</p> <p>Downstream of a stockpile area;</p> <p>Downstream of the pits to establish a possibility of any pollution to the streams;</p> <p>Downstream of infrastructure that could be possible sources of surface water pollution such as the hydrocarbons storage facilities; and</p> <p>The surface water points sampled during the hydrocensus.</p>	<ul style="list-style-type: none"> <li>▪ Republic of South Africa. (1998). Regulation GN 704 published in terms of the National Water Act of 1998. (Act no 36 of 1998), Pretoria;</li> <li>▪ Department of Water Affairs South African Water Quality Guidelines for Domestic Use Target Values (DWA SAWQTV); and</li> <li>▪ South Africa National Standard (SANS 241-1:2011) drinking water standard in order to evaluate the groundwater quality.</li> </ul>	<p>Water quality will be the main item that will be monitored by the surface water monitoring programme. Fluctuations in water quality will assist in identifying and informing reviews of management plans and mitigation measures. Samples will be submitted to a reputable laboratory for water quality analysis. A full analysis report on the quality of the water will be submitted to the mine management on an annual basis.</p>

Monitoring	Locations	Standards and/or legislative requirements	Description of the analysis to be conducted and the records to be kept
<p>Groundwater - Groundwater monitoring (samples from monitoring points)</p> <p>The suggested frequency for groundwater monitoring is as follows:</p> <p>Monthly for the first six months; and</p> <p>Bi monthly for the next six months.</p> <p>If results are stable (except for seasonal changes) and a trend is established, quarterly monitoring will be sufficient but will have to be revisited after the first year and adjusted according to results.</p>	<p>In accordance with the proposed groundwater monitoring points</p>	<ul style="list-style-type: none"> <li>▪ The Environmental Regulatory Framework in South Africa (Sections 7, 8 and 24 of the Bill of Rights);</li> <li>▪ Major Hazard Installation (MHI) Regulations (GNR 692 of 2001);</li> <li>▪ National Environmental Management Act (Act 107 of 1998), as amended (NEMA), GNR 544 and GNR 545 (Section 24 (1));</li> <li>▪ National Water Act 36 of 1998 (Sections 19-22) and GN 704;</li> <li>▪ Water Services Act 108 of 1997;</li> <li>▪ National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA) and List of Waste Management Activities requiring a Waste Management Licence (WML) GN 718 of 2008;</li> <li>▪ Hazardous Substances Act (Act 15 of 1973);</li> <li>▪ Facilities Regulations (GNR 924 of 2004); and</li> <li>▪ Hazardous Chemical Substances Regulations (GN 1179 of 1995).</li> </ul>	<p>The following parameters will be monitored: major ions, minor ions, physicochemical parameters and trace elements.</p> <p>Quarterly monitoring reports with the combined results of the surface and groundwater monitoring. The monthly results are combined cumulatively in the quarterly reports.</p>
<p>Air Blasting and Ground Vibration Monitoring</p>	<p>It is proposed that at least four seismographs be placed at the positions as indicated on Plan, one at the West of the mine, one at the North of the mine and one at Structure 4, east of the mine.</p>	<p>USBM Guideline Limits</p>	<p>Incident report</p>

**(l) Indicate the frequency of the submission of the performance assessment/ environmental audit report.**

The Performance Assessment Report will be submitted bi-annual to the Department.

**(m) Environmental Awareness Plan**

Type of training	Training Targets	Standards
<ul style="list-style-type: none"> <li>• Induction programme – legal aspects</li> <li>• Specific environmental aspects: waste, water, hydro carbons, dust, material handling rehabilitation</li> <li>• Competency</li> <li>• Health and safety – dust management, emergency preparedness, first aid.</li> <li>• Fauna and flora protection</li> </ul>	<ul style="list-style-type: none"> <li>• Management</li> <li>• Supervisors</li> <li>• Operators</li> <li>• Visitors</li> <li>• Contractors</li> </ul>	<ul style="list-style-type: none"> <li>• Records</li> <li>• Standard operating procedures</li> <li>• Signage</li> <li>• Personal Protection Equipment</li> </ul>

- Communication lines will be drawn and will cascade from the Site Manager through to the general workers.
- On a regular basis, all aspects of the operation will be checked against the prescripts of the EMP and its supporting procedures and, if established that certain of the aspects are not addressed or impacts on the environment are not mitigated properly, it will be immediately communicated to the operational team by management.
- Should the mitigation measure not be in line with the prescripts, amendments will be made and the employees will be made aware of the changes and encouraged to adhere to such.
- All site personnel will be inducted at the site and will be taken through the EMP and other relevant legal requirements to familiarize them with same.

**(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.**

- Communication lines will be drawn and will cascade from the Site Manager through to the general workers.
- On a regular basis, all aspects of the operation will be checked against the prescripts of the EMP and its supporting procedures and, if established that certain of the aspects are not addressed or impacts on the environment are not mitigated properly, it will be immediately communicated to the operational team by management.
- Should the mitigation measure not be in line with the prescripts, amendments will be made and the employees will be made aware of the changes and encouraged to adhere to such.

- All site personnel will be inducted at the site and will be taken through the EMP and other relevant legal requirements to familiarize them with same.
- Simplified signaling will be placed on site to sensitize the workers of the legal requirements attached to this EMP.

**(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.**

**Risks that may be anticipated during operations:**

- Accessibility (by public and animals)
- Risk of flooding at times of high runoff – operate outside floodlines,
- Vulnerability to potential veldt fires – fires must be prohibited or controlled,
- Supply to safe drinking water – obtain water from accredited sources,
- Risk of tree falls – check the trees branches for points of weakness before establishing camp near or under trees,
- Size of the area, that is, it large enough to carry out operations safely and have allowance for expansion and
- Potential to wind drifts. That is, the camp site should me sheltered from strong winds well enough to provide crew comfort.

Before any task could be talked, a task plan observation followed by a detailed risk assessment should be conducted – as per the main risk assessment standard operating procedure. The risks identified should be discussed and addressed thoroughly during daily pre-shifts environmental and safety meetings.

The above-mentioned measures will be adhered to and all necessary action will be taken to immediately implement corrective action when an incident occurs. Each activity and associated risks are linked in aspect and impact register to relevant procedure to prevent incidental impacts. Compliance to these procedures should be seen as the duty of all staff and contractors. Management will monitor that these procedures are adhered to and the EMP is implemented.

**(n) Specific information required by the Competent Authority**  
(Among others, confirm that the financial provision will be reviewed annually).

- The financial provision will be reviewed annually as the operation take place.

## 2) UNDERTAKING

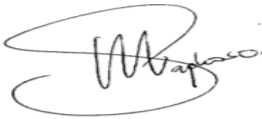
The EAP herewith confirms

- 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; and
- 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.

*Ndlelehle Mining and Consulting CC*

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**Signature of the environmental assessment practitioner:**



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Name of company:

Date: 18 November 2018

**-END-**