



## mineral resources

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Department:  
Mineral Resources  
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Autumn Skies Trading 455 CC

REFERENCE NUMBER: GP30/5/1/1/2/1002PR

# **ENVIRONMENTAL MANAGEMENT PLAN**

**SUBMITTED  
IN TERMS OF SECTION 39 AND OF REGULATION  
52 OF THE MINERAL AND PETROLEUM  
RESOURCES DEVELOPMENT ACT, 2002,  
(ACT NO. 28 OF 2002) (the Act)**

## **STANDARD DIRECTIVE**

Applicants for prospecting rights or mining permits, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an Environmental Management Plan strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 60 days of notification by the Regional Manager of the acceptance of such application. This document comprises the standard format provided by the Department in terms of Regulation 52 (2), and the standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

**IDENTIFICATION OF THE APPLICATION IN RESPECT OF WHICH THE ENVIRONMENTAL MANAGEMENT PLAN IS SUBMITTED.**

<b>ITEM</b>	<b>COMPANY CONTACT DETAILS</b>
Name	Autumn Skies Trading 455 CC
Tel no	(013) 692 3912
Fax no:	086 565 6502
Cellular no	0794914032 (Werner Harms)
E-mail address	werner@beltonmining.co.za
Postal address	P O Box 4407 Middelburg 1050

<b>ITEM</b>	<b>CONSULTANT CONTACT DETAILS (If applicable)</b>
Name	Future Mining Consultants
Tel no	083 575 7671
Fax no:	0866912411
Cellular no	083 575 7671
E-mail address	futuremining@gmail.com
Postal address	P. O. Box 53287 Wierdapark 0149

**1 REGULATION 52 (2): Description of the environment likely to be affected by the proposed prospecting or mining operation**

1.1 The environment on site relative to the environment in the surrounding area.

Most of the original fauna left the area many years ago due to agricultural activities. Although no wild animals were observed, it is assumed that Steenbuck, Duiker, Spring-Hare and jackal may be present.

Cover(thatch) grass hypamhenia hirta; Red grass themeda triandra; Maculated aloe aloe greatheadii; Suger Bush protea caffra; Black wattle; Shiny leaf rhamnus plumosum; and Tristachya leucothrix occur in the area.

(Please see Fauna and Flora report attached)

- 1.2 The specific environmental features on the site applied for which may require protection, remediation, management or avoidance.

Most of the original fauna left the area many years ago due to agricultural activities.

- 1.3 Map showing the spatial locality of all environmental, cultural/heritage and current land use features identified on site.

Other than graves (which are protected in terms of the regulations in force under the Act), none were identified.

- 1.4 Confirmation that the description of the environment has been compiled with the participation of the community, the landowner and interested and affected parties,

Please see section 7 below and attachments.

## **2 REGULATION 52 (2) (b): Assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio-economic conditions and cultural heritage.**

### **2.1 Description of the proposed prospecting or mining operation.**

#### **2.1.1 The main prospecting or mining activities (e.g. access roads, topsoil storage sites and any other basic prospecting or mining design features )**

##### **Non invasive prospecting methods:**

It is envisaged that this part of the prospecting programme may consist of the following desktop studies:

##### **Geological Desktop Study:**

*This study will entail that the area be geologically mapped using photos, geological maps and other interpretations from any existing available information.*

##### **Reconnaissance Survey:**

*Preliminary work over the region has identified a number of clay deposits and sand deposits where some outcrops. These surveys were conducted utilising visual confirmation of the surface materials and imagery.*

**Geophysical Survey:**

***A series of geophysical surveys will be investigated. A full programme will however be submitted to DME if and before commenced with.***

**Geological Mapping:**

***This study will entail that the area will be geologically mapped using photos, geological maps and other interpretations from any existing available information.***

**Satellite imagery:**

***Existing satellite imagery of the area will also be utilised.***

**Sustainability Study:**

***This study will commence once all the information relating to the invasive phases of the prospecting operation have been collected. It will assess whether a mining right application will be economically viable on the area in question. Factors such as market demand, socio-economic structure of the area, existing and prospective markets and rehabilitation costs will be considered.***

*Invasive prospecting methods**Drilling:*

<b>Year</b>	<b>Phase</b>	<b>Documentation Submission to the DMR</b>	<b>Date From Start</b>
<b>Year 1</b>	<b>Phase 1</b>		
	Drill geological holes 20 Logging and sampling Analysis Data modelling	Borehole Logs Laboratory Results	30 Weeks 52 Weeks
<b>Year 2</b>	<b>Phase 2</b>		
	Drill geological holes 17 Logging and sampling Analysis Data modelling	Borehole Logs Laboratory Results	30 Weeks 52 Weeks
<b>Year 3</b>	<b>Phase 3</b>		
	Pre-Feasibility Study	Report	40 Weeks
<b>Year 4</b>	<b>Phase 4</b>		
	Pre-Feasibility Study	Report	
<b>Year 5</b>	<b>Phase 5</b>		
	Feasibility study	Financial Analysis	30 Weeks

*Bulk Sampling (trenching)*

**Only one trench, details of which are provided below, will be done over a tree year period:**

Year	Phase	Documentation Submission to DMR	Date From Start
<b>Year 1</b>	<b>Phase 1</b>		
	Bulk Sample 60,000 m <sup>3</sup> Logging and sampling Analysis Data modelling	Sample Sheets Laboratory Results	52 Weeks 52 Weeks
<b>Year 2</b>	<b>Phase 2</b>		
	Pre-Feasibility Study	Report	20 Weeks
<b>Year 3</b>	<b>Phase 3</b>		
	Feasibility study	Financial Analysis	30 Weeks

**Top Soil:**

The following design parameters will be taken into account when designing the topsoil stockpiles:

- Topsoil will be removed up to a depth of 600mm or the available depth.
- The stockpiles must be constructed on the most gradual slope possible and limited to a height of no more than 2m.
- The slope of the stockpile material must be kept as low as possible to avoid extensive erosion of the natural resource.
- The stockpiles must be vegetated when stored for a period longer than six months.
- If erosion does occur the stockpiles can be stabilized through re-vegetation with pioneering grass species. Species include *Eragrostis curvula* and *Melinis repens*.
- Soil fertility need to be assessed and ameliorated where necessary prior to re-vegetation in order to ensure optimal growth.

**Roads and Dust:**

The following steps will be taken:

- A water cart must be present on site, and always in a working order, so that dust suppression can be practiced as frequently as necessary.
- Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.
- If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.

**2.1.2 Plan of the main activities with dimensions**

Prospecting phases Plan

**Prospecting Phases:**  
**Autumn Skies Trading 455 CC Reg. no. 2008/146618/23**

Compiled by and © held by **Future Mining Consultants**  
 Future Mining Consultants  
 Tel : 083 575 7671



Satellite image of application area:



Co-ordinates for prospecting holes:

Holes for Prospecting	WGS 84 decimal degrees	
Hole 1	27.4911	-26.0112
Hole 2	27.4938	-26.0129
Hole 3	27.4936	-26.0166
Hole 4	27.4916	-26.0151
Hole 5	27.4894	-26.0153
Hole 6	27.4872	-26.0153
Hole 7	27.4846	-26.0161
Hole 8	27.4850	-26.0199
Hole 9	27.4872	-26.0194
Hole 10	27.4893	-26.0194

**Bulk sample co-ordinates**  
 120m x 50m x 10m deep

I	27.49517	-26.00971
II	27.49510	-26.01015
III	27.49627	-26.01034
IV	27.49636	-26.00990

- Prospecting area
- Bulk sample (Trench)

**REFERENCE :1**

- National Freeway: National Route
- Arterial Road
- Main Road
- Secondary Road: Beach Mark
- Other Road: Bridge
- Track and Riding Trail
- Railway: Station or Sidling
- Other Railway: Tunnel
- Embankment: Cutting
- Power Line
- Built-up Area
- Building: Ruin
- Post Office: Police Station, Store
- Place of Worship: School, Hotel
- Farm: Shed
- Windmill/Monument
- Communication Tower
- Mine Dump: Excavation
- Trigonometrical Station: Marine Beacon
- Lighthouse and Marine Light
- Cemetery: Grave

**REFERENCE :2**

- International Boundary and Beacon
- Provincial Boundary
- Game, Nature Reserve & State Forest Boundary
- Provincial Road
- Provincial Water
- Non-provincial Road
- Non-provincial Water
- Dry Water Course
- Dry Pan
- Marsh and Vlei
- Pipeline (above ground)
- Water Tower: Reservoir: Water Point
- Coastal Rocks
- Provincial Beach Driveway
- Erosion: Sand
- Woodland
- Cultivated Land
- Orchard or Vineyard
- Reservoir: Ground
- Sea of Tides

**Description:**

Proposed area 213 ha prospecting. Prospecting will commence from Prospecting hole no. 1-10. No Prospecting will take place within 100m of any infrastructure.

Signed:	
Date:	29/07/2011
Approved:	
Date:	

### 2.1.3 Description of construction, operational, and decommissioning phases.

See table below 2.2.1.

### 2.1.4 Listed activities (in terms of the NEMA EIA regulations)

Topsoil removal, excavations, transport, replacing topsoil, dust suppression.

## 2.2 Identification of potential impacts

(Refer to the guideline)

### 2.2.1 Potential impacts per activity and listed activities.

Activity:	Environmental Impact: (C.6.7)	Mitigation Measures: (C.6.8)
Topsoil Removal:	Topography:	The negative impact on the topography of the mining site will be addressed during backfilling.
	Soil:	<p>The following design parameters will be taken into account when designing the topsoil stockpiles:</p> <ul style="list-style-type: none"> <li>• Topsoil will be removed up to a depth of 600mm or the available depth.</li> <li>• The stockpiles must be constructed on the most gradual slope possible and limited to a height of no more than 2m.</li> <li>• The slope of the stockpile material must be kept as low as possible to avoid extensive erosion of the natural resource.</li> <li>• The stockpiles must be vegetated when stored for a period longer than six months.</li> <li>• If erosion does occur the stockpiles can be stabilized through re-vegetation with pioneering grass species. Species include <i>Eragrostis curvula</i> and <i>Melinis repens</i>.</li> <li>• Soil fertility need to be assessed and ameliorated where necessary prior to re-vegetation in order to ensure optimal growth.</li> </ul>
	Flora:	Spreading topsoil over the disturbed areas during the closure phase, and then seeding the areas with an endemic seed mixture address the impact on vegetation. It is recommended that six monthly monitoring sessions be undertaken after the topsoil was restored to assess the success of the re-vegetation. During these monitoring sessions additional measures such as fertilisation can be implemented if necessary.
	Fauna:	After the rehabilitation of the mining area and successful re-vegetation, the displaced animal life will return in the time to come. It is however recommended that the mine manager needs to make it clear to labourers not to hunt or trap the local fauna especially the smaller mammals.
	Surface Hydrology:	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.

	Air Quality:	The following steps will be taken: <ul style="list-style-type: none"> <li>• A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
Excavating	Geology:	The mine will be committed to optimise the use of the mined mineral in order to ensure no resources are wasted. No other management measures will be possible.
	Topography:	The negative impact on the topography of the mining site will be addressed during backfilling.
	Soil:	The impacts of excavating soil will be addressed during the Replacing Topsoil activities.
	Surface Hydrology:	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
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Transport	Air Quality	The following steps will be taken: <ul style="list-style-type: none"> <li>• A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
Replacing Topsoil:	Topography	The negative impact on the topography of the mining site will be negated once all the stockpiled material is removed to the processing plants or backfilling into the quarry pit.
	Flora:	Spreading topsoil over the disturbed areas during the closure phase, and then seeding the areas with an endemic seed mixture address the impact on vegetation. It is recommended that six monthly monitoring sessions be undertaken after the topsoil was restored to assess the success of the re-vegetation. During these monitoring sessions additional measures such as fertilisation can be implemented if necessary.

Surface Hydrology:	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
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Noise	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
Dust Suppression:	Noise All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.

### 2.2.2 Potential cumulative impacts.

Activity:	Environmental Impact: (C.6.7)	Mitigation Measures: (C.6.8)
Topsoil Removal:	Topography:	The negative impact on the topography of the mining site will be addressed during backfilling.
	Soil:	The following design parameters will be taken into account when designing the topsoil stockpiles: <ul style="list-style-type: none"> <li>• Topsoil will be removed up to a depth of 600mm or the available depth.</li> <li>• The stockpiles must be constructed on the most gradual slope possible and limited to a height of no more than 2m.</li> <li>• The slope of the stockpile material must be kept as low as possible to avoid extensive erosion of the natural resource.</li> <li>• The stockpiles must be vegetated when stored for a period longer than six months.</li> <li>• If erosion does occur the stockpiles can be stabilized through re-vegetation with pioneering grass species. Species include <i>Eragrostis curvula</i> and <i>Melinis repens</i>.</li> <li>• Soil fertility need to be assessed and ameliorated where necessary prior to re-vegetation in order to ensure optimal growth.</li> </ul>
	Flora:	Spreading topsoil over the disturbed areas during the closure phase, and then seeding the areas with an endemic seed mixture address the impact on vegetation. It is recommended that six monthly monitoring sessions be undertaken after the topsoil was restored to assess the success of the re-vegetation. During these monitoring sessions additional measures such as fertilisation can be implemented if necessary.
	Fauna:	After the rehabilitation of the mining area and successful re-vegetation, the displaced animal life will return in the time to come. It is however recommended that the mine manager needs to make it clear to labourers not to hunt or trap the local fauna especially the smaller mammals.

	Surface Hydrology:	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Air Quality:	The following steps will be taken: <ul style="list-style-type: none"> <li>• A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
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Excavating	Geology:	The mine will be committed to optimise the use of the mined mineral in order to ensure no resources are wasted. No other management measures will be possible.
	Topography:	The negative impact on the topography of the mining site will be addressed during backfilling.
	Soil:	The impacts of excavating soil will be addressed during the Replacing Topsoil activities.
	Surface Hydrology:	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
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Replacing Topsoil:	Topography	The negative impact on the topography of the mining site will be negated once all the stockpiled material is removed to the processing plants or backfilling into the quarry pit.

	Flora:	Spreading topsoil over the disturbed areas during the closure phase, and then seeding the areas with an endemic seed mixture address the impact on vegetation. It is recommended that six monthly monitoring sessions be undertaken after the topsoil was restored to assess the success of the re-vegetation. During these monitoring sessions additional measures such as fertilisation can be implemented if necessary.
	Surface Hydrology:	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
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Dust Suppression:	Noise	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.

### 2.2.3 Potential impact on heritage resources

Apart from the old graves referred to above (which are in any event protected by the regulations in force under the Act) there is a variety of different land uses and many different land owners and as opposed to a remote rural area. The area earmarked for the single bulk sample will not be affected. Please refer to section 7 to comments by parties and the South African Heritage Resources Agency in this regard.

### 2.2.4 Potential impacts on communities, individuals or competing land uses in close proximity.

(If no such impacts are identified this must be specifically stated together with a clear explanation why this is not the case.)

Please refer to section 7 below for comments by land owners and other interested parties on such impacts.

### 2.2.5 Confirmation that the list of potential impacts has been compiled with the participation of the landowner and interested and affected parties,

Please refer to section 7 below.

**2.2.6 Confirmation of specialist report appended.**

(Refer to guideline)

Yes, a Fauna and Flora report has been appended.

**3 REGULATION 52 (2) (c): Summary of the assessment of the significance of the potential impacts and the proposed mitigation measures to minimise adverse impacts.**

**3.1 Assessment of the significance of the potential impacts**

**3.1.1 Criteria of assigning significance to potential impacts**

The criteria described by the DMR for a standard EMP including an EIA Process were used.

### 3.1.2 Potential impact of each main activity in each phase, and corresponding significance assessment

Activity:	Environmental Impact: (C.6.7)	Mitigation Measures: (C.6.8)
Topsoil Removal:	Topography:	The negative impact on the topography of the mining site will be addressed during backfilling.
	Soil:	<p>The following design parameters will be taken into account when designing the topsoil stockpiles:</p> <ul style="list-style-type: none"> <li>• Topsoil will be removed up to a depth of 600mm or the available depth.</li> <li>• The stockpiles must be constructed on the most gradual slope possible and limited to a height of no more than 2m.</li> <li>• The slope of the stockpile material must be kept as low as possible to avoid extensive erosion of the natural resource.</li> <li>• The stockpiles must be vegetated when stored for a period longer than six months.</li> <li>• If erosion does occur the stockpiles can be stabilized through re-vegetation with pioneering grass species. Species include <i>Eragrostis curvula</i> and <i>Melinis repens</i>.</li> <li>• Soil fertility need to be assessed and ameliorated where necessary prior to re-vegetation in order to ensure optimal growth.</li> </ul>
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	Fauna:	After the rehabilitation of the mining area and successful re-vegetation, the displaced animal life will return in the time to come. It is however recommended that the mine manager needs to make it clear to labourers not to hunt or trap the local fauna especially the smaller mammals.
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	Topography:	The negative impact on the topography of the mining site will be addressed during backfilling.
	Soil:	The impacts of excavating soil will be addressed during the Replacing Topsoil activities.

	Surface Hydrology:	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
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	Noise	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
Transport	Air Quality	The following steps will be taken: <ul style="list-style-type: none"> <li>• A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
Replacing Topsoil:	Topography	The negative impact on the topography of the mining site will be negated once all the stockpiled material is removed to the processing plants or backfilling into the quarry pit.
	Flora:	Spreading topsoil over the disturbed areas during the closure phase, and then seeding the areas with an endemic seed mixture address the impact on vegetation. It is recommended that six monthly monitoring sessions be undertaken after the topsoil was restored to assess the success of the re-vegetation. During these monitoring sessions additional measures such as fertilisation can be implemented if necessary.
	Surface Hydrology:	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Air Quality	The following steps will be taken: <ul style="list-style-type: none"> <li>• A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
Dust Suppression:	Noise	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.

### 3.1.3 Assessment of potential cumulative impacts.

#### **ASSESSMENT OF POTENTIAL IMPACTS**

Impacts in this section are considered by the following criteria:

Extent, Duration, Intensity (processes) and Probability, with a value awarded to each of the aspects considered.

The extent of each impact is described as either:

- Local: on the property (1)
- Regional: within municipal boundaries (2)
- Provincial: within provincial boundaries (3)
- National: within national boundaries (4)
- International: crossing national boundaries (5)

The duration of each impact is described as either:

- Short term less than a month (1)
- Medium term: a month or more (2)
- Long term: until the end of the life of the mine (3)
- Permanent: after mining activities ceased (4)

The intensity is described as either:

- Undisturbed: natural processes continue undisturbed (1)
- Changed: natural processes continue, but are altered (2)
- Stop: natural processes stop (3)

The probability is described as either:

- Impossible: the impact will not take place (0)
- Unlikely: the impact may occur occasionally (up to 30%) (1)
- Likely: the impact may occur regularly (up to 60%) (2)
- Definite: the impact will definitely occur (up to 100%) (3)

The awarded values are used to determine the significance rating in the following way:

$$\text{Rating} = (\text{Extent} + \text{Duration} + \text{Intensity}) \times \text{Probability}$$

The significance of each impact is then awarded according to the following scale:

**TABLE 20: IMPACT SCALE**

RATING	SIGNIFICANCE
0	No impact
3 -14	Low impact
15 – 26	Medium impact
27 - 36	High impact

CONSTRUCTION PHASE:								
Activity	Environmental Aspect	Impact	Extent (A)	Duration (B)	Processes (C)	Probability (D)	Rating(E) (A+B+C)xD=E	Significance
Topsoil Removal	Geology:	No Impact				Impossible (0)	0	No Impact
	Topography	Lowered	Local (1)	Long Term (3)	Changed (2)	Definite (3)	18	Medium Impact
	Soil:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Flora:	Removed	Local(1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local(1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Excavating	Geology:	Removed	Local (1)	Permanent (4)	Stop (3)	Definite (3)	24	Medium Impact
	Topography	Lowered	Local (1)	Permanent (4)	Stop (3)	Definite (3)	24	Medium Impact

<b>CONSTRUCTION PHASE:</b>								
<b>Activity</b>	<b>Environmental Aspect</b>	<b>Impact</b>	<b>Extent (A)</b>	<b>Duration (B)</b>	<b>Processes (C)</b>	<b>Probability (D)</b>	<b>Rating(E) (A+B+C)xD=E</b>	<b>Significance</b>
	Soil:	Removed	Local (1)	Long Term (3)	Changed (2)	Definite (3)	18	Medium Impact
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Hauling:	Geology:	Removed	Local (1)	Permanent (4)	Stop (3)	Definite (3)	24	Medium Impact
	Topography	Lowered	Local (1)	Permanent (4)	Stop(3)	Definite (3)	24	Medium Impact
	Soil:	Removed	Local (1)	Long Term (3)	Changed (2)	Definite (3)	18	Medium Impact
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Backfilling:	Geology:	Changed geological structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Topography	Altered topography	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Soil:	Overburden replaced	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact

CONSTRUCTION PHASE:								
Activity	Environmental Aspect	Impact	Extent (A)	Duration (B)	Processes (C)	Probability (D)	Rating(E) (A+B+C)xD=E	Significance
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Loading:	Geology:	No Impact				Impossible (0)	0	No Impact
	Topography	No Impact				Impossible (0)	0	No Impact
	Soil:	No Impact				Impossible (0)	0	No Impact
	Flora:	No Impact				Impossible (0)	0	No Impact
	Fauna:	No Impact				Impossible (0)	0	No Impact
	Surface Hydrology:	No Impact				Impossible (0)	0	No Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	No Impact (off site)					Impossible (0)	0
Transport:	Geology:	No Impact (off site)				Impossible (0)	0	No Impact
	Topography	No Impact (off site)				Impossible (0)	0	No Impact
	Soil:	No Impact (off site)				Impossible (0)	0	No Impact
	Flora:	No Impact (off site)				Impossible (0)	0	No Impact
	Fauna:	No Impact (off site)				Impossible (0)	0	No Impact
	Surface Hydrology:	No Impact (off site)				Impossible (0)	0	No Impact
	Groundwater:	No Impact (off site)				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increased traffic	Regional (2)	Long Term (3)	Changed (2)	Unlikely (1)	7	Low Impact
Replacing Topsoil:	Geology:	Changed geological structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Topography	Altered topography	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Soil:	Altered soil structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium

CONSTRUCTION PHASE:								
Activity	Environmental Aspect	Impact	Extent (A)	Duration (B)	Processes (C)	Probability (D)	Rating(E) (A+B+C)xD=E	Significance
								Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Unlikely (1)	7	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Vegetating :	Geology:	Changed geological structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Topography	Altered topography	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Soil:	Prevent erosion (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Likely (2)	14	Low Impact
	Flora:	Re-vegetating (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Fauna:	New Habitat (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Surface Hydrology:	Changed runoff (Positive Impact)	Regional (2)	Permanent (4)	Changed (2)	Likely (2)	16	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Positive Impact – back to natural state	Regional (2)	Permanent (4)	Changed (2)	Definite (3)	24	Medium Impact
	Noise:	Positive Impact	Regional (2)	Permanent (4)	Changed (2)	Definite (3)	24	Medium Impact
	Visual Aspects:	Increase visual level – Positive Impact	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Dust Suppression:	Geology:	No Impact				Impossible (0)	0	No Impact
	Topography	No Impact				Impossible (0)	0	No Impact
	Soil:	No Impact				Impossible (0)	0	No Impact
	Flora:	No Impact				Impossible (0)	0	No Impact
	Fauna:	No Impact				Impossible (0)	0	No Impact

CONSTRUCTION PHASE:								
Activity	Environmental Aspect	Impact	Extent (A)	Duration (B)	Processes (C)	Probability (D)	Rating(E) (A+B+C)xD=E	Significance
	Surface Hydrology:	No Impact				Impossible (0)	0	No Impact
	Groundwater:	Groundwater recharge (Positive Impact)	Local (1)	Short Term (1)	Changed (2)	Unlikely (1)	4	Low Impact
	Air Quality:	Reduced dust levels (Positive Impact)	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact

OPERATIONAL PHASE:								
Activity	Environmental Aspect	Impact	Extent (A)	Duration (B)	Processes (C)	Probability (D)	Rating(E) (A+B+C)xD=E	Significance
Topsoil Removal	Geology:	No Impact				Impossible (0)	0	No Impact
	Topography	Lowered	Local (1)	Long Term (3)	Changed (2)	Definite (3)	18	Medium Impact
	Soil:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Flora:	Removed	Local(1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local(1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Blasting	Geology:	Removed	Local (1)	Permanent (4)	Stop (3)	Definite (3)	24	Medium Impact
	Topography	Lowered	Local (1)	Permanent (4)	Stop (3)	Definite (3)	24	Medium Impact
	Soil:	Removed	Local (1)	Long Term (3)	Changed (2)	Definite (3)	18	Medium Impact
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact

OPERATIONAL PHASE:								
Activity	Environmental Aspect	Impact	Extent (A)	Duration (B)	Processes (C)	Probability (D)	Rating(E) (A+B+C)xD=E	Significance
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Excavating	Geology:	Removed	Local (1)	Permanent (4)	Stop (3)	Definite (3)	24	Medium Impact
	Topography	Lowered	Local (1)	Permanent (4)	Stop (3)	Definite (3)	24	Medium Impact
	Soil:	Removed	Local (1)	Long Term (3)	Changed (2)	Definite (3)	18	Medium Impact
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Hauling:	Geology:	Removed	Local (1)	Permanent (4)	Stop (3)	Definite (3)	24	Medium Impact
	Topography	Lowered	Local (1)	Permanent (4)	Stop(3)	Definite (3)	24	Medium Impact
	Soil:	Removed	Local (1)	Long Term (3)	Changed (2)	Definite (3)	18	Medium Impact
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Backfilling:	Geology:	Changed geological structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Topography	Altered topography	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Soil:	Overburden replaced	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact

OPERATIONAL PHASE:								
Activity	Environmental Aspect	Impact	Extent (A)	Duration (B)	Processes (C)	Probability (D)	Rating(E) (A+B+C)xD=E	Significance
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Loading:	Geology:	No Impact				Impossible (0)	0	No Impact
	Topography	No Impact				Impossible (0)	0	No Impact
	Soil:	No Impact				Impossible (0)	0	No Impact
	Flora:	No Impact				Impossible (0)	0	No Impact
	Fauna:	No Impact				Impossible (0)	0	No Impact
	Surface Hydrology:	No Impact				Impossible (0)	0	No Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	No Impact (off site)				Impossible (0)	0	No Impact
Transport:	Geology:	No Impact (off site)				Impossible (0)	0	No Impact
	Topography	No Impact (off site)				Impossible (0)	0	No Impact
	Soil:	No Impact (off site)				Impossible (0)	0	No Impact
	Flora:	No Impact (off site)				Impossible (0)	0	No Impact
	Fauna:	No Impact (off site)				Impossible (0)	0	No Impact
	Surface Hydrology:	No Impact (off site)				Impossible (0)	0	No Impact
	Groundwater:	No Impact (off site)				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact

OPERATIONAL PHASE:								
Activity	Environmental Aspect	Impact	Extent (A)	Duration (B)	Processes (C)	Probability (D)	Rating(E) (A+B+C)xD=E	Significance
	Visual Aspects:	Increased traffic	Regional (2)	Long Term (3)	Changed (2)	Unlikely (1)	7	Low Impact
Replacing Topsoil:	Geology:	Changed geological structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Topography	Altered topography	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Soil:	Altered soil structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust level	Regional (2)	Long Term (3)	Changed (2)	Unlikely (1)	7	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Vegetating :	Geology:	Changed geological structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Topography	Altered topography	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Soil:	Prevent erosion (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Likely (2)	14	Low Impact
	Flora:	Re-vegetating (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Fauna:	New Habitat (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Surface Hydrology:	Changed runoff (Positive Impact)	Regional (2)	Permanent (4)	Changed (2)	Likely (2)	16	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Positive Impact – back to natural state	Regional (2)	Permanent (4)	Changed (2)	Definite (3)	24	Medium Impact
	Noise:	Positive Impact	Regional (2)	Permanent (4)	Changed (2)	Definite (3)	24	Medium Impact
	Visual Aspects:	Increase visual level – Positive Impact	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact

OPERATIONAL PHASE:								
Activity	Environmental Aspect	Impact	Extent (A)	Duration (B)	Processes (C)	Probability (D)	Rating(E) (A+B+C)xD=E	Significance
Dust Suppression:	Geology:	No Impact				Impossible (0)	0	No Impact
	Topography	No Impact				Impossible (0)	0	No Impact
	Soil:	No Impact				Impossible (0)	0	No Impact
	Flora:	No Impact				Impossible (0)	0	No Impact
	Fauna:	No Impact				Impossible (0)	0	No Impact
	Surface Hydrology:	No Impact				Impossible (0)	0	No Impact
	Groundwater:	Groundwater recharge (Positive Impact)	Local (1)	Short Term (1)	Changed (2)	Unlikely (1)	4	Low Impact
	Air Quality:	Reduced dust levels (Positive Impact)	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise level	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact

CLOSURE PHASE:								
Activity	Environmental Aspect	Impact	Extent	Duration	Processes	Probability	Rating	Significance
Final Backfilling And Sloping:	Geology:	Changed geological structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Topography	Altered topography	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Soil:	Altered soil structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust levels	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise levels	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Final Replacing of Topsoil:	Geology:	No Impact				Impossible (0)	0	No Impact
	Topography	Altered topography	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact

CLOSURE PHASE:								
Activity	Environmental Aspect	Impact	Extent	Duration	Processes	Probability	Rating	Significance
	Soil:	Altered soil structure	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Flora:	Restore growth medium (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Fauna:	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	Increased dust levels	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise levels	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Final Vegetating:	Geology:	No Impact				Impossible (0)	0	No Impact
	Topography	No Impact				Impossible (0)	0	No Impact
	Soil:	Prevent Erosion (Positive Impact)	Local (1)	Long Term (3)	Changed (2)	Likely (2)	12	Low Impact
	Flora:	Re-vegetating (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Fauna:	New Habitat (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Surface Hydrology:	Changed runoff (Positive Impact)	Local (1)	Permanent (4)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	No Impact				Impossible (0)	0	No Impact
	Noise:	No Impact				Impossible (0)	0	No Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact
Activity	Environmental Aspect	Impact	Extent	Duration	Processes	Probability	Rating	Significance
Dust Suppression:	Geology:	No Impact				Impossible (0)	0	No Impact
	Topography	No Impact				Impossible (0)	0	No Impact
	Soil:	No Impact				Impossible (0)	0	No Impact

CLOSURE PHASE:								
Activity	Environmental Aspect	Impact	Extent	Duration	Processes	Probability	Rating	Significance
	Flora:	Removed	Local (1)	Long Term (3)	Stop (3)	Definite (3)	21	Medium Impact
	Fauna	Temporarily vacate	Local (1)	Short Term (1)	Changed (2)	Definite (3)	12	Low Impact
	Surface Hydrology:	Changed runoff	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	21	Medium Impact
	Groundwater:	Groundwater recharge (Positive Impact)	Local (1)	Short Term (1)	Changed (2)	Unlikely (1)	4	Low Impact
	Air Quality:	Reduced dust levels (Positive Impact)	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Noise:	Increased noise levels	Regional (2)	Long Term (3)	Changed (2)	Likely (2)	14	Low Impact
	Visual Aspects:	Increase visual level	Regional (2)	Long Term (3)	Changed (2)	Definite (3)	24	Medium Impact

POST-CLOSURE PHASE:								
Activity	Environmental Aspect	Impact	Extent	Duration	Processes	Probability	Rating	Significance
Erosion Control:	Geology:	No Impact				Impossible (0)	0	No Impact
	Typography	No Impact				Impossible (0)	0	No Impact
	Soil:	Limit erosion (Positive Impact)	Local (1)	Long Term (3)	Changed (2)	Likely (2)	12	Low Impact
	Flora:	Protect growth medium (Positive Impact)	Local (1)	Long Term (3)	Changed (2)	Likely (2)	12	Low Impact
	Fauna:	No Impact				Impossible (0)	0	No Impact
	Surface Hydrology:	Changed runoff (Positive Impact)	Local (1)	Long Term (3)	Changed (2)	Likely (2)	12	Low Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	No Impact				Impossible (0)	0	No Impact
	Noise:	No Impact				Impossible (0)	0	No Impact
	Visual Aspects:	No Impact				Impossible (0)	0	No Impact
Vegetation Monitoring:	Geology:	No Impact				Impossible (0)	0	No Impact
	Typography	No Impact				Impossible (0)	0	No Impact
	Soil:	No Impact				Impossible (0)	0	No Impact
	Flora:	Re-vegetating	Local (1)	Long Term (3)	Changed	Likely (2)	12	Low

POST-CLOSURE PHASE:								
Activity	Environmental Aspect	Impact	Extent	Duration	Processes	Probability	Rating	Significance
		(Positive Impact)			(2)			Impact
	Fauna:	No Impact				Impossible (0)	0	No Impact
	Surface Hydrology:	No Impact				Impossible (0)	0	No Impact
	Groundwater:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	No Impact				Impossible (0)	0	No Impact
	Noise:	No Impact				Impossible (0)	0	No Impact
	Visual Aspects:	No Impact				Impossible (0)	0	No Impact
	Air Quality:	No Impact				Impossible (0)	0	No Impact
	Noise:	No Impact				Impossible (0)	0	No Impact
	Visual Aspects:	No Impact				Impossible (0)	0	No Impact

### 3.2 Proposed mitigation measures to minimise adverse impacts.

See Table above

#### 3.2.1 List of actions, activities, or processes that have sufficiently significant impacts to require mitigation.

CONSTRUCTION PHASE:				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
Topsoil Removal	Geology:	No Impact	No Impact	No Mitigation required
	Topography	Lowered	Medium Impact	The negative impact on the topography of the mining site will be addressed during backfilling and sloping of all excavated and disturbed areas.
	Soil:	Removed	Medium Impact	The following design parameters will be taken into account when designing the topsoil stockpiles: <ul style="list-style-type: none"> <li>• Topsoil will be removed up to a depth of 300mm or the available depth.</li> <li>• The stockpiles must be constructed on the most gradual slope possible and limited to a height of no more than 2m.</li> <li>• The slope of the stockpile material must be kept as low as possible to avoid extensive erosion of the natural resource.</li> <li>• The stockpiles must be vegetated when stored for a period longer than six months.</li> <li>• If erosion does occur the stockpiles can be stabilized through re-vegetation with pioneering grass species. Species include <i>Eragrostis curvula</i> and <i>Melinis repens</i>.</li> <li>• Soil fertility need to be assessed and ameliorated where necessary prior to re-vegetation in order to ensure optimal growth.</li> </ul>
	Flora:	Removed	Medium Impact	Spreading topsoil over the disturbed areas during the closure phase, and then seeding the areas with an endemic seed mixture address the impact on

CONSTRUCTION PHASE:				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
				vegetation. It is recommended that six monthly monitoring sessions be undertaken after the topsoil was restored to assess the success of the re-vegetation. During these monitoring sessions additional measures such as fertilisation can be implemented if necessary.
	Fauna:	Removed	Low Impact	After the rehabilitation of the mining area and successful re-vegetation, the displaced animal life will return in the time to come. It is however recommended that the mine manager must inform all labourers that they are not allowed to hunt or trap the local fauna.
	Surface Hydrology:	Changed runoff	Medium Impact	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased noise levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>• A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
	Visual Aspects:	No Impact	No Impact	No mitigation required.
Excavating	Geology:	Removed	Medium Impact	The mine will be committed to optimise the use of the mined mineral in order to ensure no resources are wasted. No other management measures will be possible.
	Typography	Lowered	Medium Impact	The negative impact on the topography of the mining site will be addressed during backfilling and sloping of all excavated and disturbed areas.
	Soil:	Removed	Medium Impact	The impacts of excavating on soil will be addressed during the Replacing Topsoil activities. Overburden will be stockpiled according to the measure described above under the soil utilisation guide.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	Changed runoff	Medium Impact	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Groundwater:	No Impact	No Impact	No mitigation required.

CONSTRUCTION PHASE:				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
	Air Quality:	Increased dust levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site
	Visual Aspects:	No Impact	No Impact	No mitigation required.
Backfilling:	Geology:	Changed geological structure	Medium Impact	The mine will be committed to optimise the use of the mined mineral in order to ensure no resources are wasted. No other management measures will be possible.
	Typography	Altered topography	Medium Impact	The negative impact on the topography of the mining site will be addressed during backfilling. All the sidewalls of the mined out quarry will be sloped to 20°, after which the topsoil stored during the mining operation will be spread evenly over the disturbed areas to facilitate re-vegetation.
	Soil:	No Impact	No Impact	No mitigation required.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	Changed runoff	Medium Impact	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased dust levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
Loading:	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
	Visual Aspects:	No Impact	No Impact	No mitigation required.
	Geology:	No Impact	No Impact	No mitigation required.
	Typography	No Impact	No Impact	No mitigation required.
	Soil:	Compacting of soil	Low Impact	The impacts of stockpiling on the soil structure will be addressed when topsoil is returned to these areas

CONSTRUCTION PHASE:				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
		structure		during the closure phase. If the topsoil is compacted (where it was not removed), it will be ripped before vegetation is introduced.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	No Impact	No Impact	No mitigation required.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased dust levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
Visual Aspects:	No Impact	No Impact	No mitigation required.	
Transport	Geology:	No Impact	No Impact	No mitigation required.
	Typography	No Impact	No Impact	No mitigation required.
	Soil:	No Impact	No Impact	No mitigation required.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	No Impact	No Impact	No mitigation required.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased dust levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.	
Visual Aspects:	No Impact	No Impact	No mitigation required.	
Replacing Topsoil:	Geology:	No Impact	No Impact	No mitigation required.
	Typography	Altered topography	Medium Impact	The negative impact on the topography of the mining site will be negated once all the stockpiled material is removed to the processing plants or backfilling into the quarry pit.
	Soil:	Altered soil structure	Medium Impact	No mitigation of the soil structure is possible. The growth medium is however returned to facilitate the establishment of vegetation.

CONSTRUCTION PHASE:				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
	Flora:	Restore growth medium (Positive impact)	No impact	No mitigation required
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	Changed runoff	Medium Impact	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased dust levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, and always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
	Visual Aspects:	No Impact	No Impact	No mitigation required.
Vegetating:	Geology:	No Impact	No Impact	No mitigation required.
	Typography	No Impact	No Impact	No mitigation required.
	Soil:	Prevent erosion (Positive Impact)	Low Impact	No mitigation required.
	Flora:	Re-vegetating (Positive Impact)	Medium Impact	No mitigation required.
	Fauna:	New Habitat (Positive Impact)	Medium Impact	No mitigation required.
	Surface Hydrology:	Changed runoff (Positive Impact)	Medium Impact	No mitigation required.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	No Impact	No Impact	No mitigation required.
	Noise:	No Impact	No Impact	No mitigation required.
	Visual Aspects:	No Impact	No Impact	No mitigation required.
Dust Suppression:	Geology:	No Impact	No Impact	No mitigation required.
	Typography	No Impact	No Impact	No mitigation required.

CONSTRUCTION PHASE:				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
	Soil:	No Impact	No Impact	No mitigation required.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	No Impact	No Impact	No mitigation required.
	Groundwater:	Groundwater recharge (Positive Impact)	Low Impact	No mitigation required.
	Air Quality:	Reduced dust levels (Positive Impact)	Low Impact	No mitigation required.
	Noise:	Increased noise levels.	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
	Visual Aspects:	No Impact	No Impact	No mitigation required.

OPERATIONAL PHASE				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
Topsoil Removal	Geology:	No Impact	No Impact	No Mitigation required
	Typography	Lowered	Medium Impact	The negative impact on the topography of the mining site will be addressed during backfilling and sloping of all excavated and disturbed areas.
	Soil:	Removed	Medium Impact	The following design parameters will be taken into account when designing the topsoil stockpiles: <ul style="list-style-type: none"> <li>Topsoil will be removed up to a depth of 300mm or the available depth.</li> <li>The stockpiles must be constructed on the most gradual slope possible and limited to a height of no more than 2m.</li> <li>The slope of the stockpile material must be kept as low as possible to avoid extensive erosion of the natural resource.</li> <li>The stockpiles must be vegetated when stored for a period longer than six months.</li> <li>If erosion does occur the stockpiles can be stabilized through re-vegetation with pioneering grass species. Species include <i>Eragrostis curvula</i> and <i>Melinis repens</i>.</li> <li>Soil fertility need to be assessed and ameliorated where necessary prior to re-vegetation in order to ensure optimal growth.</li> </ul>
	Flora:	Removed	Medium Impact	Spreading topsoil over the disturbed areas during the closure phase, and then seeding the areas with an endemic seed mixture address the impact on vegetation. It is recommended that six monthly monitoring sessions be undertaken after the topsoil was restored to assess the success of the re-vegetation. During these monitoring sessions additional measures such as fertilisation can be implemented if necessary.
	Fauna:	Removed	Low Impact	After the rehabilitation of the mining area and successful re-vegetation, the displaced animal life will return in the time to come. It is however recommended that the mine manager must inform all labourers that they are not allowed to hunt or trap the local fauna.

OPERATIONAL PHASE				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
	Surface Hydrology:	Changed runoff	Medium Impact	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased noise levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, and always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
	Visual Aspects:	No Impact	No Impact	No mitigation required.
Blasting	Geology:	Removed	Medium Impact	The mine will be committed to optimise the use of the mined mineral in order to ensure no resources are wasted. No other management measures will be possible.
	Typography	Lowered	Medium Impact	No mitigation measures required.
	Soil:	Removed	Medium Impact	No mitigation measures required.
	Flora:	No Impact	No Impact	No mitigation measures required.
	Fauna:	No Impact	No Impact	No mitigation measures required.
	Surface Hydrology:	Changed runoff	Medium Impact	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Groundwater:	No Impact	No Impact	No mitigation measures required.
	Air Quality:	Increased dust levels	Low Impact	No mitigation measures required as the impact is only temporarily.
	Noise:	Increased noise levels	Low Impact	No mitigation measures required as the impact is only temporarily. Please refer to neighbouring chicken farm inset below.
Visual Aspects:	No Impact	No Impact	No mitigation measures required as the impact is only temporarily.	
Excavating	Geology:	Removed	Medium Impact	The mine will be committed to optimise the use of the mined mineral in order to ensure no resources are wasted. No other management measures will be possible.

OPERATIONAL PHASE				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
	Typography	Lowered	Medium Impact	The negative impact on the topography of the mining site will be addressed during backfilling and sloping of all excavated and disturbed areas.
	Soil:	Removed	Medium Impact	The impacts of excavating on soil will be addressed during the Replacing Topsoil activities. Overburden will be stockpiled according to the measure described above under the soil utilisation guide.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	Changed runoff	Medium Impact	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased dust levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, and always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site
	Visual Aspects:	No Impact	No Impact	No mitigation required.
Backfilling:	Geology:	Changed geological structure	Medium Impact	The mine will be committed to optimise the use of the mined mineral in order to ensure no resources are wasted. No other management measures will be possible.
	Typography	Altered topography	Medium Impact	The negative impact on the topography of the mining site will be addressed during backfilling. All the sidewalls of the mined out quarry will be sloped to 20°, after which the topsoil stored during the mining operation will be spread evenly over the disturbed areas to facilitate re-vegetation.
	Soil:	No Impact	No Impact	No mitigation required.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	Changed runoff	Medium Impact	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Groundwater:	No Impact	No Impact	No mitigation required.

OPERATIONAL PHASE				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
	Air Quality:	Increased dust levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
	Visual Aspects:	No Impact	No Impact	No mitigation required.
Loading:	Geology:	No Impact	No Impact	No mitigation required.
	Typography	No Impact	No Impact	No mitigation required.
	Soil:	Compacting of soil structure	Low Impact	The impacts of stockpiling on the soil structure will be addressed when topsoil is returned to these areas during the closure phase. If the topsoil is compacted (where it was not removed), it will be ripped before vegetation is introduced.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	No Impact	No Impact	No mitigation required.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased dust levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
Visual Aspects:	No Impact	No Impact	No mitigation required.	
Transport	Geology:	No Impact	No Impact	No mitigation required.
	Typography	No Impact	No Impact	No mitigation required.
	Soil:	No Impact	No Impact	No mitigation required.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	No Impact	No Impact	No mitigation required.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased dust levels	Low Impact	The following steps will be taken: <ul style="list-style-type: none"> <li>A water cart must be present on site, an always in a working order, so that dust suppression can be</li> </ul>

OPERATIONAL PHASE				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
				<p>practiced as frequently as necessary.</p> <ul style="list-style-type: none"> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
	Visual Aspects:	No Impact	No Impact	No mitigation required.
Replacing Topsoil:	Geology:	No Impact	No Impact	No mitigation required.
	Typography	Altered topography	Medium Impact	The negative impact on the topography of the mining site will be negated once all the stockpiled material is removed to the processing plants or backfilling into the quarry pit.
	Soil:	Altered soil structure	Medium Impact	No mitigation of the soil structure is possible. The growth medium is however returned to facilitate the establishment of vegetation.
	Flora:	Restore growth medium (Positive impact)	No impact	No mitigation required
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	Changed runoff	Medium Impact	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	Increased dust levels	Low Impact	<p>The following steps will be taken:</p> <ul style="list-style-type: none"> <li>A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>
	Noise:	Increased noise levels	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
Visual Aspects:	No Impact	No Impact	No mitigation required.	
Vegetating:	Geology:	No Impact	No Impact	No mitigation required.
	Typography	No Impact	No Impact	No mitigation required.
	Soil:	Prevent erosion (Positive	Low Impact	No mitigation required.

OPERATIONAL PHASE				
Activity	Environmental Aspect	Impact	Significance	Mitigation Measures
		Impact)		
	Flora:	Re-vegetating (Positive Impact)	Medium Impact	No mitigation required.
	Fauna:	New Habitat (Positive Impact)	Medium Impact	No mitigation required.
	Surface Hydrology:	Changed runoff (Positive Impact)	Medium Impact	No mitigation required.
	Groundwater:	No Impact	No Impact	No mitigation required.
	Air Quality:	No Impact	No Impact	No mitigation required.
	Noise:	No Impact	No Impact	No mitigation required.
	Visual Aspects:	No Impact	No Impact	No mitigation required.
Dust Suppression:	Geology:	No Impact	No Impact	No mitigation required.
	Typography	No Impact	No Impact	No mitigation required.
	Soil:	No Impact	No Impact	No mitigation required.
	Flora:	No Impact	No Impact	No mitigation required.
	Fauna:	No Impact	No Impact	No mitigation required.
	Surface Hydrology:	No Impact	No Impact	No mitigation required.
	Groundwater:	Groundwater recharge (Positive Impact)	Low Impact	No mitigation required.
	Air Quality:	Reduced dust levels (Positive Impact)	Low Impact	No mitigation required.
	Noise:	Increased noise levels.	Low Impact	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.
	Visual Aspects:	No Impact	No Impact	No mitigation required.

### 3.2.2 Concomitant list of appropriate technical or management options

(Chosen to modify, remedy, control or stop any action, activity, or process which will cause significant impacts on the environment, socio-economic conditions and historical and cultural aspects as identified. Attach detail of each technical or management option as appendices)

Please refer to the table in 3.1.3

### 3.2.3 Review the significance of the identified impacts (after bringing the proposed mitigation measures into consideration).

Please refer to the table in 3.2.1



#### 4.2 Alignment of rehabilitation with the closure objectives

(Describe and ensure that the rehabilitation plan is compatible with the closure objectives determined in accordance with the baseline study as prescribed).

CLOSURE PHASE					
Activity	Environmental Aspect	Impact	Mitigation Measures	Annual Cost	Final Cost
<b>Final filling Back-and Sloping:</b>	<b>Geology:</b>	Partially restores geology although to an altered state.	The backfilling of overburden restores the geological material, but with an altered geological structure.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Topography:</b>	Partially restores topography although to an altered state.	The void left by excavating is partially backfilled using overburden, thus minimising the initial negative impact. The topography however remains altered when compared with the natural topography.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Soil:</b>	Partially restores topography although to an altered state.	Sloping will result in a new, altered soil structures.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Flora:</b>	Final backfilling and sloping will have no impact on flora, other than preparing the ground for replacing of topsoil and vegetating.	No mitigation measures required.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Fauna:</b>	Final backfilling and sloping will have no impact on fauna.	No mitigation measures required.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Surface Hydrology:</b>	Change in surface water runoff patterns.	Backfilling will alter the topography and cause a change in surface water runoff patterns.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Groundwater:</b>	Final backfilling and sloping will have no impact on groundwater.	No mitigation measures required.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Air Quality:</b>	Movement of vehicles and machinery will increase dust levels.	Mitigation already catered for in previous phase.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Noise:</b>	Movement of vehicles and machinery will increase noise levels.	Mitigation already catered for in previous phase.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Visual Aspects:</b>	The visual impact is restricted to the road between Magaliesburg and Koster. It should be mentioned that the proposed operations will not deviate significantly in regard to visual impact as oppose to the excavations already on site.	Mitigation already catered for in previous phase.	R0-00 Already catered for.	R0-00 Already catered for.
<b>Final Replacing of Topsoil:</b>	<b>Geology:</b>	The backfilling of overburden restores the geological material, but with an altered geological structure.	Backfilling is taken from the overburden stockpiled referred to above as to prepare the site for replacing of topsoil.	R0-00 Cost already catered for in the excavating phase.	R0-00 Cost already catered for in the excavation phase.
	<b>Topography:</b>	The void left by excavating is partially	Backfilling with overburden.	R0-00	R0-00

CLOSURE PHASE					
Activity	Environmental Aspect	Impact	Mitigation Measures	Annual Cost	Final Cost
		backfilled using overburden, thus minimising the initial negative impact. The topography however remains altered when compared with the natural topography.			
	<b>Soil:</b>	Topsoil replacement.	The topsoil stockpiled for rehabilitation purposes referred to above are placed on top of the overburden.	R0-00 Cost already catered for in the excavation phase.	R0-00 Cost already catered for in the excavation phase.
	<b>Flora:</b>	Re-vegetation of site.	This mitigation measure has already been catered for in the topsoil removal phase.	R0-00	R0-00
	<b>Fauna:</b>	Impact already exists.	As vegetation re-establishes itself on the site the natural Fauna will gradually return.	R0-00	R0-00
	<b>Surface Hydrology:</b>	The replacing of topsoil over the partially backfilled pit or excavation areas will have the final alteration on the topography and changed runoff patterns.	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.
	<b>Groundwater:</b>	Groundwater will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Air Quality:</b>	Movement of vehicles and machinery will increase the dust levels.	The following steps will be taken: <ul style="list-style-type: none"> <li>• A water cart must be present on site, an always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>• Water for dust suppression purposes will be transported from the old quarry excavation on the existing site where storm water accumulated over the years.</li> <li>• Periodic watering of the access roads will be conducted if and when required, especially in August and September before the raining season commence.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on</li> </ul>	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.

CLOSURE PHASE					
Activity	Environmental Aspect	Impact	Mitigation Measures	Annual Cost	Final Cost
			and the dust level rise above 10mg/m <sup>3</sup> dust masks must be made available to workers.		
	<b>Noise:</b>	Movement of vehicles and machinery will increase the noise levels.	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.	R0-00	R0-00
	<b>Visual Aspects:</b>	The visual impact is restricted to the road between Magaliesburg and Koster. It should be mentioned that the proposed operations will not deviate significantly in regard to visual impact as oppose to the excavations already on site.	No mitigation measures required.	R0-00	R0-00
<b>Vegetating:</b>	<b>Geology:</b>	Vegetating will not impact geology.	No mitigation measures required.	R0-00	R0-00
	<b>Topography:</b>	Vegetating will not impact topography.	No mitigation measures required.	R0-00	R0-00
	<b>Soil:</b>	Positive impact - vegetating the disturbed areas will prevent soil erosion.	No mitigation measures required.	R0-00	R0-00
	<b>Flora:</b>	Positive impact - vegetating the disturbed areas with endemic species will create a new altered habitat for fauna.	No mitigation measures required.	R0-00	R0-00
	<b>Fauna:</b>	Positive impact - vegetating the disturbed areas with endemic species will create a new altered habitat for fauna.	No mitigation measures required.	R0-00	R0-00
	<b>Surface Hydrology:</b>	The newly established vegetation will result in a higher Tc (time of concentration), resulting in lower flood peaks and reduced risk of erosion and flood damage downstream. The subsequent slower surface water flow will change the runoff.	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.	R0-00	R0-00
	<b>Groundwater:</b>	Groundwater will not be impacted.	No mitigation measures required.	R0-00	R0-00

CLOSURE PHASE					
Activity	Environmental Aspect	Impact	Mitigation Measures	Annual Cost	Final Cost
	<b>Air Quality:</b>	Positive impact – air quality will dramatically improve as re-vegetation commences.	No mitigation measures required.	R0-00	R0-00
	<b>Noise:</b>	Noise levels will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Visual Aspects:</b>	Positive impact – will dramatically improve as re-vegetation commences.	No mitigation measures required.	R0-00	R0-00
<b>Dust Suppression:</b>	<b>Geology:</b>	Geology will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Topography:</b>	Topography will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Soil:</b>	Soil will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Flora:</b>	Flora will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Fauna:</b>	Fauna will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Surface Hydrology:</b>	Surface hydrology will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Groundwater:</b>	Water sprayed on the roads or disturbed areas may seep into the groundwater system.	As the product of storm water accumulated in the old quarry excavation on the existing site, referred to above, as opposed to contaminated water, will be utilised for this purpose. As thus dust suppression will accordingly not contaminate underground water, no mitigation measures are required.	R0-00	R0-00
	<b>Air Quality:</b>	Positive impact - water sprayed on the roads or disturbed areas will reduce dust pollution of moving vehicles.	No mitigation measures required.	R0-00	R0-00
	<b>Noise:</b>	The movement of vehicles will increase the noise levels.	Frequent maintenance of vehicles required - refer to above.	R0-00 Already catered for above.	R0-00 Already catered for above.
<b>Visual Aspects:</b>	Visual aspects will not be impacted.	No mitigation measures required.	R0-00	R0-00	

#### 4.3 Quantum calculations.

(Provide a calculation of the quantum of the financial provision required to manage and rehabilitate the environment, in accordance with the guideline prescribed in terms of regulation 54 (1) in respect of each of the phases referred to).

## CALCULATION OF THE QUANTUM FOR END OF LIFE CLOSURE

Applicant:	Autumn Skies Trading 455 CC	Location:	Magaliesburg
Evaluators:	A.S. Richter	Date:	30 September 2011

Environmental Parametres	
Risk Class	B
Area Sensitivity	Low
Nature of Terrain	Undulating
Proximity to Urban Area	Peril-urban

No	Description	Unit	Quantity	Master rate	Multiplication Factor	Weighting Factor1	Amounts(rands)
1	Dismanteling of <b>Prosecing plant.Related structures</b> (Including conveyors and power lines)	m <sup>3</sup>	0	R 6.82	1.00	1.10	R 0.00
2(b)	Demolition of <b>reinforced concrete buildings and structures</b>	m <sup>2</sup>	0	R 140.00	1.00	1.10	R 0.00
3	Rehabilitation of <b>access roads</b>	m <sup>2</sup>	0	R 17.00	1.00	1.10	R 0.00
5	Demolition of <b>housing and/or administration facilities</b>	m <sup>2</sup>	0	R 190.00	1.00	1.10	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	6	R 99 600.00	0.04	1.10	R 26 294.40
10	<b>General surface rehabilitation</b>	ha	6	R 52 600.00	1.00	1.10	R 347 160.00
14	2 to 3 years of <b>maintenance and aftercare</b>	ha	6	R 7 000.00	1.00	1.10	R 46 200.00
15(A)	Specialist study	Sum	1	R 10 000.00	1.00	1.10	R 11 000.00
<b>Subtotal 1</b>							<b>R 430 654.40</b>
1	Preliminary and General	6.0% if Subtotal 1>100 000 000 12.0% if Subtotal 1<100 000 000		Weighting factor 2		1.05	R 54 262.45
7	Contingency			10.0% of Subtotal 1			R 43 065.44
<b>Subtotal 2</b>							<b>R 527 982.29</b>
Add Vat (14%)							R 73 917.52
<b>GRAND TOTAL</b>							<b>R 601 899.82</b>

#### 4.4 Undertaking to provide financial provision

(Indicate that the required amount will be provided should the right be granted).

It will be observed from the attached **memorandum of agreement** that Mr A I Ponton agreed to finance the project in his personal capacity. A **letter from RMB Private Bank** (co-signed by Mr Ponton) confirms that the necessary funds are available. A **declaration** to this effect signed by Mr Ponton is also attached.

## **5 REGULATION 52 (2) (e): Planned monitoring and performance assessment of the environmental management plan.**

### **5.1 List of identified impacts requiring monitoring programmes.**

Dust levels, Noise levels, Storm water.

### **5.2 Functional requirements for monitoring programmes.**

#### ***MONITORING AND ENVIRONMENTAL PERFORMANCE ASSESSMENTS***

The following monitoring procedures will be implemented at the mine in order to ensure compliance with this document, as well as relevant legislation. The monitoring procedures are implemented to ensure that the mitigation measures implemented are successful.

#### **Dust Level Monitoring**

The dust levels on site as well as at the potential dust impact sites must be monitored on an annual basis by means of dust fallout sampling or any other appropriate measure. This will ensure that current management strategies are sufficient, or need to be upgraded.

#### **Noise Level Monitoring**

The monitoring of noise levels on-site as well as at the potential noise impact sites during the annual monitoring and auditing session is recommended.

#### **Storm water Monitoring:**

The effectiveness of the storm water control measures over the whole mine will be audited annually. If any shortfalls are identified they will be rectified with the appropriate physical and management measures. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.

### **5.3 Roles and responsibilities for the execution of monitoring programmes.**

Please see 8.1 for action plan.

### **5.4 Committed time frames for monitoring and reporting.**

Please see 8.1 for action plan.

## 6 REGULATION 52 (2) (f): Closure and environmental objectives.

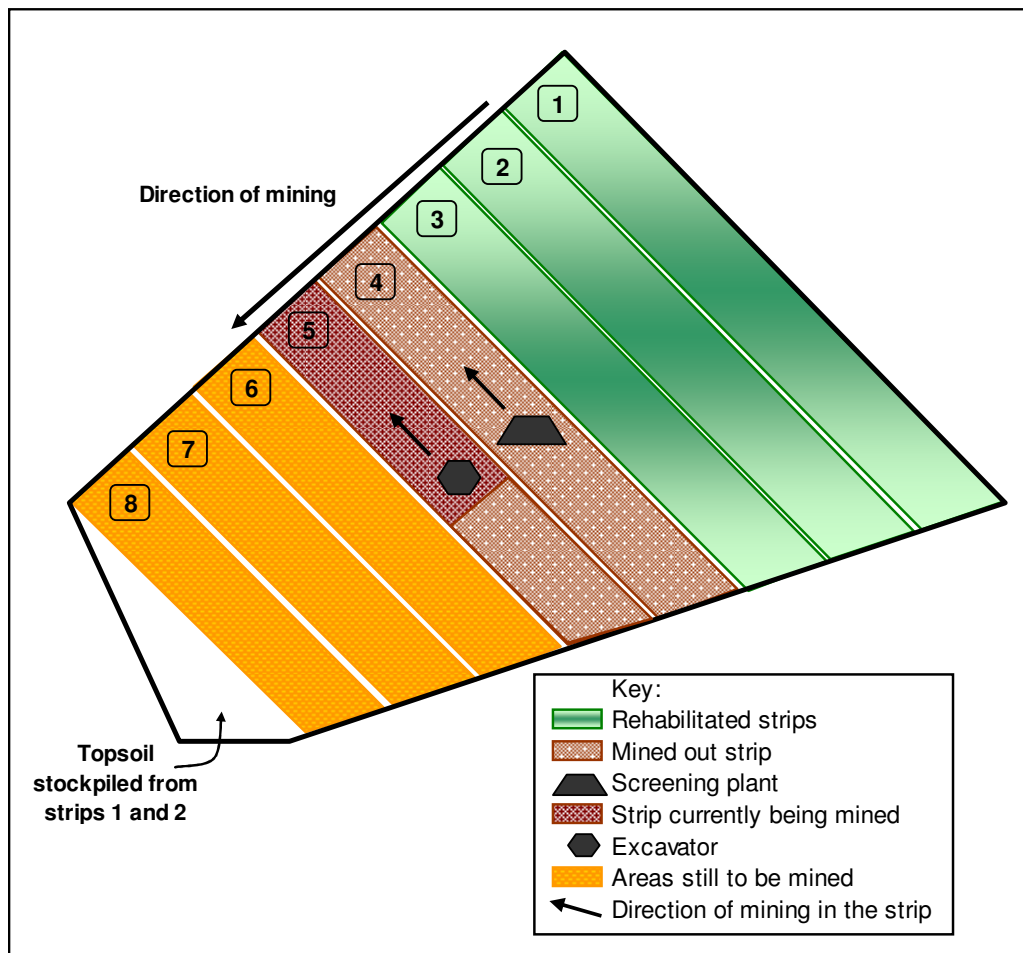
### 6.1 Rehabilitation plan

(Show the areas and aerial extent of the main prospecting or mining activities, including the anticipated prospected or mining area at the time of closure).

#### Drilling:

TNW size (75mm diameter) diamond core drill holes are planned to be drilled on the property. On completion of the drilled holes logging & sampling of the core is done for the purpose of analysis. The remainder of the extracted core, not utilised for sampling & assaying purposes, will be placed down the drilled hole. The hole is then filled with a slurry mixture of cement & water in the ratio of 1 bag of cement per 10 meters of depth. This mixture solidifies into a solid state and will prohibit any access or ingress into the created cavity afterwards. The cavity is then filled with this cement mixture to approximately 1 meter below surface. The top 1 meter of the hole is then filled with material from the hole. This would enable ploughing without damaging farming equipment on a farm land without exposing the concrete plug at all.

#### Bulk sample:



## 6.2 Closure objectives and their extent of alignment to the pre-mining environment.

CLOSURE PHASE					
Activity	Environmental Aspect	Impact	Mitigation Measures	Annual Cost	Final Cost
<b>Final Back-filling and Sloping:</b>	<b>Geology:</b>	Partially restores geology although to an altered state.	The backfilling of overburden restores the geological material, but with an altered geological structure.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Topography:</b>	Partially restores topography although to an altered state.	The void left by excavating is partially backfilled using overburden, thus minimising the initial negative impact. The topography however remains altered when compared with the natural topography.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Soil:</b>	Partially restores topography although to an altered state.	Sloping will result in a new, altered soil structures.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Flora:</b>	Final backfilling and sloping will have no impact on flora, other than preparing the ground for replacing of topsoil and vegetating.	No mitigation measures required.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Fauna:</b>	Final backfilling and sloping will have no impact on fauna.	No mitigation measures required.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Surface Hydrology:</b>	Change in surface water runoff patterns.	Backfilling will alter the topography and cause a change in surface water runoff patterns.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Groundwater:</b>	Final backfilling and sloping will have no impact on groundwater.	No mitigation measures required.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Air Quality:</b>	Movement of vehicles and machinery will increase dust levels.	Mitigation already catered for in previous phase.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Noise:</b>	Movement of vehicles and machinery will increase noise levels.	Mitigation already catered for in previous phase.	R0-00 Already catered for.	R0-00 Already catered for.
	<b>Visual Aspects:</b>	The visual impact is restricted to the road between Magaliesburg and Koster. It should be mentioned that the proposed operations will not deviate significantly in regard to visual impact as oppose to the excavations already on site.	Mitigation already catered for in previous phase.	R0-00 Already catered for.	R0-00 Already catered for.
<b>Final Replacing of Topsoil:</b>	<b>Geology:</b>	The backfilling of overburden restores the geological material, but with an altered geological structure.	Backfilling is taken from the overburden stockpiled referred to above as to prepare the site for replacing of topsoil.	R0-00 Cost already catered for in the excavating phase.	R0-00 Cost already catered for in the excavation phase.

CLOSURE PHASE					
Activity	Environmental Aspect	Impact	Mitigation Measures	Annual Cost	Final Cost
	<b>Topography:</b>	The void left by excavating is partially backfilled using overburden, thus minimising the initial negative impact. The topography however remains altered when compared with the natural topography.	Backfilling with overburden.	R0-00	R0-00
	<b>Soil:</b>	Topsoil replacement.	The topsoil stockpiled for rehabilitation purposes referred to above are placed on top of the overburden.	R0-00 Cost already catered for in the excavation phase.	R0-00 Cost already catered for in the excavation phase.
	<b>Flora:</b>	Re-vegetation of site.	This mitigation measure has already been catered for in the topsoil removal phase.	R0-00	R0-00
	<b>Fauna:</b>	Impact already exists.	As vegetation re-establishes itself on the site the natural Fauna will gradually return.	R0-00	R0-00
	<b>Surface Hydrology:</b>	The replacing of topsoil over the partially backfilled pit or excavation areas will have the final alteration on the topography and changed runoff patterns.	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.
	<b>Groundwater:</b>	Groundwater will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Air Quality:</b>	Movement of vehicles and machinery will increase the dust levels.	The following steps will be taken: <ul style="list-style-type: none"> <li>• A water cart must be present on site, always in a working order, so that dust suppression can be practiced as frequently as necessary.</li> <li>• Water for dust suppression purposes will be transported from the old quarry excavation on the existing site where storm water accumulated over the years.</li> <li>• Periodic watering of the access roads will be conducted if and when required, especially in August and September before the raining season commence.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> </ul>	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.

CLOSURE PHASE					
Activity	Environmental Aspect	Impact	Mitigation Measures	Annual Cost	Final Cost
			<ul style="list-style-type: none"> <li>If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>		
	<b>Noise:</b>	Movement of vehicles and machinery will increase the noise levels.	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.	R0-00	R0-00
	<b>Visual Aspects:</b>	The visual impact is restricted to the road between Magaliesburg and Koster. It should be mentioned that the proposed operations will not deviate significantly in regard to visual impact as oppose to the excavations already on site.	No mitigation measures required.	R0-00	R0-00
<b>Vegetating:</b>	<b>Geology:</b>	Vegetating will not impact geology.	No mitigation measures required.	R0-00	R0-00
	<b>Topography:</b>	Vegetating will not impact topography.	No mitigation measures required.	R0-00	R0-00
	<b>Soil:</b>	Positive impact - vegetating the disturbed areas will prevent soil erosion.	No mitigation measures required.	R0-00	R0-00
	<b>Flora:</b>	Positive impact - vegetating the disturbed areas with endemic species will create a new altered habitat for fauna.	No mitigation measures required.	R0-00	R0-00
	<b>Fauna:</b>	Positive impact - vegetating the disturbed areas with endemic species will create a new altered habitat for fauna.	No mitigation measures required.	R0-00	R0-00
	<b>Surface Hydrology:</b>	The newly established vegetation will result in a higher Tc (time of concentration), resulting in lower flood peaks and reduced risk of erosion and flood damage downstream. The subsequent slower surface water flow will change the runoff.	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of berms and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.	R0-00	R0-00
	<b>Groundwater:</b>	Groundwater will not	No mitigation measures required.	R0-00	R0-00

CLOSURE PHASE					
Activity	Environmental Aspect	Impact	Mitigation Measures	Annual Cost	Final Cost
		be impacted.			
	<b>Air Quality:</b>	Positive impact – air quality will dramatically improve as re-vegetation commences.	No mitigation measures required.	R0-00	R0-00
	<b>Noise:</b>	Noise levels will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Visual Aspects:</b>	Positive impact – will dramatically improve as re-vegetation commences.	No mitigation measures required.	R0-00	R0-00
<b>Dust Suppression:</b>	<b>Geology:</b>	Geology will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Topography:</b>	Topography will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Soil:</b>	Soil will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Flora:</b>	Flora will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Fauna:</b>	Fauna will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Surface Hydrology:</b>	Surface hydrology will not be impacted.	No mitigation measures required.	R0-00	R0-00
	<b>Groundwater:</b>	Water sprayed on the roads or disturbed areas may seep into the groundwater system.	As the product of storm water accumulated in the old quarry excavation on the existing site, referred to above, as opposed to contaminated water, will be utilised for this purpose. As thus dust suppression will accordingly not contaminate underground water, no mitigation measures are required.	R0-00	R0-00
	<b>Air Quality:</b>	Positive impact - water sprayed on the roads or disturbed areas will reduce dust pollution of moving vehicles.	No mitigation measures required.	R0-00	R0-00
	<b>Noise:</b>	The movement of vehicles will increase the noise levels.	Frequent maintenance of vehicles required - refer to above.	R0-00 Already catered for above.	R0-00 Already catered for above.
	<b>Visual Aspects:</b>	Visual aspects will not be impacted.	No mitigation measures required.	R0-00	R0-00

### 6.3 Confirmation of consultation

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

The bulk of the parties indicated that the land will be utilised for agriculture or development. If an application for a mining right is however submitted and granted, the land will be mined.

## **7 REGULATION 52 (2) (g): Record of the public participation and the results thereof.**

### **7.1 Identification of interested and affected parties.**

(Provide the information referred to in the guideline)

- ✚ **The proposed prospecting area is mainly farm land and no specific community in the area have been identified whose socio economic activities will be influenced by the prospecting activities.**
- ✚ **The Department of Land Affairs was consulted (letter attached).**
- ✚ **No lands claims seem to be involved.**
- ✚ **No traditional authority was identified.**
- ✚ **The community is not the land owner.**
- ✚ **List of land owners: ((al the properties below are portions of the farm Koesterfontein 45 IQ, Magisterial District of Krugersdorp):**
  - ❖ Portion 2: 54 undivided shareholders (please see list attached), represented by Mr Matthys Cornelius (email message confirming same from Mr Cornelius also attached).
  - ❖ Portion 27: Mr Mark Daniel Helfrish.
  - ❖ Portion 28: Mr Andre Fredrik Wilsenach.
  - ❖ Portion 29: Mr Andre Fredrik Wilsenach.
  - ❖ Portion 33: Mr William Cress.
  - ❖ Portion 40: Mr Leonard Francoise du Toit.
  - ❖ Portion 41: Mr Matthys Johannes Cornelius.
  - ❖ Portion 42: Mr Ian Joseph Brinley Holman
  - ❖ Portion 43: Mr Simon Charles Onslow Wales
  - ❖ Portion 44: Mr Andrew Williams Robinson
- ✚ **None of the landowners indicated that there are separate lawful occupants other than themselves.**

- ✚ As opposed to a mining right, it is unlikely that the socio economic conditions will be adversely affected by the proposed activities.
- ✚ The relevant local municipality is Mogale City Local Municipality.
- ✚ Formal letters were either faxed or emailed to the said local municipality, the South African Heritage Resources Agency and the North West Department of Agriculture, Conservation and Forestry (copies of letters attached hereto), as well as the Department of Land Affairs. Mogale City Local Municipality sent two replies (also attached hereto).
- ✚ Some of the land owners were consulted via formal letters (attached).
- ✚ An adverticment was placed in the local newspaper (attached).
- ✚ Notice boards were placed on various strategic points at the property, as well as strategic points in town (Magaliesburg). Photos attached.
- ✚ Public participation templates were delivered to the land owners by hand and many replied via email to the consultants.
- ✚ Many of the land owners and other affected parties replied via email or fax to the Future Mining Consultants and information documents were sent to them via email (comments and objections received attached).
- ✚ An initial meeting was scheduled at the said consultant's office in Midrand, which was poorly attended (please refer to the recording of the meeting attached as well as the attendance register).
- ✚ Due to the severe reaction received from the parties the applicant and the consultants hosted a second meeting in Magaliesburg and sent out via email another more detailed information document (attached). This meeting was well attended (please refer to the recording of the meeting attached hereto, as well as the attached attendance register).
- ✚ After a subsequent meeting was held (after the initial public participation template for the above application was submitted with the initial comments/objections) for the second prospecting right application (in respect of which a surprisingly approximately 60 people or so attended) an enormous number of additional objections were received on the above application. Due to the fact that the system allowed the said consultants to load all these objections, it was decided to revise the initial public participation template and to submit same as to accommodate the additional issues.

## 7.2 The details of the engagement process.

### 7.2.1 Description of the information provided to the community, landowners, and interested and affected parties.

It will be observed in the said formal attached letters referred to above that the parties were provided with a short description of the proposed activities. Parties were in the said letters as well as in the information document specifically requested to indicate if:

- ✳ Any possible socio economic impacts which could be identify in regard to the applicant's proposed mining and related activities.
- ✳ Any possible sites of national heritage that could be identify which could be impacted by the applicant's proposed activities that need to be protected.
- ✳ Any other environmental impact(s) or risk(s) which they could identify and wish to mention.

Many of the land owners and other affected parties replied via email or fax to Future Mining Consultants and information pertaining to the prospecting methods, ect documents were sent to them via email (comments and objections received attached).

A short briefing was also provided by the applicant during both meetings.

An advertisement (attached) was placed in the local newspaper informing parties and inviting all affected parties to the first meeting. Details pertaining to the venue, time and location of the second meeting were communicated to parties *via* email.

### 7.3 List of which parties were identified in 7.1 above that were in fact consulted, and which were not consulted.

The list of land owners as indicated below (al the properties below are portions of the farm Koesterfontein 45 IQ, Magisterial District of Krugersdorp):

- 🗺 Portion 2: 54 undivided shareholders (please see list attached), represented by Mr Matthys Cornelius (email message confirming same from Mr Cornelius also attached).

- ✚ Portion 27: Mr Mark Daniel Helfrish.
- ✚ Portion 28: Mr Andre Fredrik Wilsenach.
- ✚ Portion 29: Mr Andre Fredrik Wilsenach.
- ✚ Portion 33: Mr William Cress.
- ✚ Portion 40: Mr Leonard Francoise du Toit.
- ✚ Portion 41: Mr Matthys Johannes Cornelius.
- ✚ Portion 42: Mr Ian Joseph Brinley Holman
- ✚ Portion 43: Mr Simon Charles Onslow Wales
- ✚ Portion 44: Mr Andrew Williams Robinson

**List of other parties:**

- ✚ **Formal letters were faxed to the said local municipality, South African Heritage Resources Agency and the North West Department of Agriculture, Conservation and Forestry (copies of letters attached hereto), as well as the Department of Land Affairs. Mogale City Local Municipality sent a reply (also attached hereto).**
- ✚ **Many of the land owners and other affected parties replied via email or fax to Future Mining Consultants and information documents were sent to them via email (comments and objections received attached).**

**7.3.1 List of views raised by consulted parties regarding the existing cultural, socio-economic or biophysical environment.**

**The main concerns highlighted at the first meeting (please refer to already enclosed attendance register) may be summarised as follows:**

✚ **Water issues:**

**The issue of water seems to be a major concern especially if the water table is intersected and it was raised by the said land owners. Mr Harms (from the applicant) explained that**

boreholes will on average be 30 metres deep, which will in most places not intersect the water table. He said some boreholes might be 50metres, but not likely to be more than 80metres. Mr Helfrich said although his borehole was 98 metres, Mr Robinson's is only 15 metres and that both boreholes pump 1000 litres an hour and can only be pumped for short periods. He said it would appear from existing information that 70% of the mineral ore-body is less than 50m deep. Mr Harms said this issue will be addressed in the EMPlan. He also explained that no processing whatsoever will take place on the proposed prospecting area and that the actual impact of the water table will be at the stage when mining commences.

- ✚ On request of the parties at the meeting Mr Harms placed it on record that the bulk sample as indicated on the map will be 100 metres long, 10 meters deep and 50 metres wide. Mr Harms said that the area for the bulk sample was specifically selected where the old historic un-rehabilitated tunnels are situated.
- ✚ It was also placed on record that there are dangerous old historic workings sporadically present on the entire prospecting area.
- ✚ The parties were concerned about the impact of the actual mining (if it comes to that stage of course) on the surrounding development proposals like housing, the proposed golf course, etc., which will be addressed in the social and labour plan and environmental management programme to be submitted in support of a mining right application.
- ✚ The parties agreed that minutes should be taken at the meetings and distributed to all the parties as far as practical.

The following concerns from emails and faxes by parties were raised:

✚ **Mr Ian Holman:**

- Requested a map indicating the boreholes and bulk sample, which was handed to him at the second meeting, as he apparently could not receive same via then email which was sent to him.
- Requested that the impact of water and all other possible impacts of the invasive prospecting be addressed, (as water affects the livelihood of all owners) this will be addressed in the EMPlan.
- Complains about the first meeting being held in Midrand, the reason for the second meeting held in Magaliesburg, which he attended.
- Complains that all owners were not personally consulted, the reason for the second information document subsequently being emailed to the parties.

 **Mr Andrew Robinson;**


- **Apart from the water issues discussed at the first meeting, he requested more detail pertaining to the prospecting methods pertaining to the impacts on agricultural activities, which the applicant provided via email (attached).**
- **He stated that he is more concerned about the actual mining phase and that he would have to sell his property in such event (especially as many of the land owners moved to the area away from the city life. This is obviously not relevant to this exercise.**


 **Mr Paul Komane**

- **Does not support any mining or related activities in the area due to his concern round the water issues.**
- **He feels that his chicken farm (in respect of which he had invested a great deal of capital) will be negatively affected. As it is not at a mining stage yet this concern is noted for future reference.**

 **Mr Thys van As**

- **Requested copies of all documents pertaining to the application (including the EMPlan) be submitted to him and wished to enquire as to the ownership of the applicant.**
- **It was explained to him (email attached) that the EMPlan was not drafted as yet and that the entire application will not be forwarded to him as it contains privileged information. The information letter detailing the project was subsequently sent to him. The composition of the ownership of the applicant is privileged information.**
- **He also complained about the meeting being held in Midrand, but he attended the second meeting in Magaliesburg.**

 **Mogale City Local Municipality – requested to be informed and to receive copies of the social and labour plan, which is of cause not applicable to a prospecting right and a copy of the EMPlan will be sent to them.**

 **The Federation for a Sustainable Environment -requested to be informed and to receive copies of documents. The CEO did however not attend any of the meetings. The EMPlan will be sent to them.**

- ✚ The acceptance letter and plan were also emailed to the parties. Digital copies of the minutes were loaded onto the Landowners Association of Magaliesburg' website as they were too large to email.
- ✚ Copies of the minutes were made available via a link of the Landowners Association of Magaliesburg' website as they were too large to email.
- ✚ Mr L F du Toit attached the “Global Acid Rock Drainage Guide” as to highlight the effects of mining, which is not relevant to this application, but same was noted for future reference if and when a mining right is applied for.

### Second meeting Magaliesburg

- ✚ The applicant explained in detail what prospecting methods are planned.
- ✚ The water issue was highlighted and Mr Ian Holman pointed out that a geological fault runs through his property which should be taken into account – the applicant took note. *Mr Holman had a copy of the MPRDA with him and made the comment that the said consultants did not follow the correct procedure in that parties should have had 180 days to comment. Mr Richter from the consultants however pointed out that same was applicable to a mining right and that for a prospecting right an applicant has only 30 days after acceptance contemplated in section 16(4) of the MPRDA to submit the results of the public participation in the form of the relevant template. Mr Holman did not agree.*
- ✚ The meeting pointed out that uranium mining would have a much more devastating effect on the environment as opposed to gold mining – point was taken for future reference.
- ✚ There was much debate over the process of consultation described by the DMR and the deadlines for comments. The meeting was of the opinion that the EMPlan should be drafted before the public participation could take place.
- ✚ The remaining comments/concerns/objections raised have already been covered by the written comments and the first meeting.

7.3.2 List of views raised by consulted parties on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed prospecting or mining operation.

The following were received via email a vast number of parties and land owners signed the exact same letter as mention above.

- ✚ The proposed prospecting area falls on eco-sensitive Class 1 Ridges noted as important sites with High Agricultural Potential. These ridges are extremely biodiversity and threatened eco zones.” This aspect has been addressed in the attached report compiled by the environmental consultants “4evergreen”. It should however be mentioned as also indicated on the map (enclosed in its report) drafted by the last mentioned consultants that the proposed bulk sample area is not affected by same. In this regard, your attention is once again drawn to the said letters of the DMR and Mogale City Local Municipality which clearly states that the mineral reserves in the area should be kept available/preserved for future mining activities for current and future generations. It is also interesting to note that the unknown author of the said template ignores the fact that agricultural activities also have a negative effect on the environment.
- ✚ “The proposed prospecting area falls within close proximity of the UNESCO Cradle of Humankind World Heritage Site and Buffer Zone” Although noted, it is simply due the distance from the prospecting area that it is considered highly unlikely that the proposed activities could have any effect whatsoever on the said World Heritage Site.
- ✚ “The proposed prospecting area falls within the Blaaubank River catchment which feeds the Magalies River from which an estimated 6,500-8,000 households are reliant on the water for domestic purposes. The Magalies River also feeds into the Hartebeespoort Dam”. Point taken. The said author seems to miss the comparison between the impact of a few prospecting boreholes as opposed to the impact of agriculture activities on same.
- ✚ “Surface and ground water resources in Magaliesburg and the Cradle area are already threatened and under increased pressure from activities such as mining and industry.” Noted. Once again the said author seems to miss the impact of agriculture activities on same. It was also observed during the site visits that apart from agricultural activities, the majority of the area has been invaded by alien plant species, which is the main reason for the scarcity of surface and underground water and a action plan by the landowners to remove and control these plants will increase the water availability extensively.
- ✚ “The proposed area contains numerous heritage sites from the Anglo Boer War including Grave Sites.” Assumption noted. No one could however thus far identify them and this issue was therefore taken up with the said South African Heritage Resources Agency (copy of letter attached). Their reply is attached hereto, the contents of which are self explanatory. After communicating with the applicant, it was decided that a detailed study will only be necessary when an application for a mining right is submitted in the area. It should be noted that the applicant will in each individual case consult with each land owner before any invasive prospecting activities commence and that the regulations in force under the Mine Health and Safety Act, 1996, protect the grave sites in any event.

The applicant also indicated that the area covering the proposed bulk sample is not affected and consists mainly of old historic workings.

- ✚ “Prospecting Activities would negatively affect the strong tourism sector of Magaliesburg and as well as the micro economic activities and livelihoods of landowners, families and labourers.” Noted, but fail to appreciate or understand the relevancy due the distance from the town and any known tourism attractions.
- ✚ “The area has documented red data fauna and flora species.” This aspect has been addressed in the attached report compiled by the environmental consultants “4evergreen”.
- ✚ “The area is stressed for groundwater and cannot support any high water consuming activities such as prospecting and there is no reticulation water.” Noted, but fail to appreciate that water usage for the boreholes could have any impact as groundwater is according to the applicant not likely to be utilised altogether in the process.

### 7.3.3 Other concerns raised by the aforesaid parties.

- ✚ Security/Safety/Access Control issues:

Mr Helfrich explained that it is an absolute necessity that a list of those people that will conduct the field survey and all other personnel/workers (technical or otherwise) be made available to the relevant land owners beforehand together with their ID's. Mr Harms agreed to this and said that he will personally visit land owners well in advance and explain what they are going to do on the property and when.

- ✚ “The appointed consultant, Future Mining Consultants, has failed to consult with respective landowners and/or affected parties in accordance with the required regulations.” This is simply not true as the exact process was followed as explained above and the mere fact that the reaction to the application was so enormous and so many parties attended the meeting, that it would suggest that the said consultants were more than successful in its efforts to consult.
- ✚ “The consultant has failed to provide affected parties with numerous pertinent information and documentation that was requested from the onset, at the public participation meeting and subsequently via email” You will agree that this cannot be true as the information document referred to above, including the map, which was hand delivered to the landowners, is quite comprehensive in regard to the prospecting methods, time frames and prospecting phases. You will also agree that the technical and financial ability is for the Minister of the DMR to decide upon during the adjudication process and not open for scrutiny or perusal

by affected and interested parties. The same goes for details regarding the BEE composition.

**7.3.4 Confirmation that minutes and records of the consultations are appended.**

Yes, the recordings have been loaded onto the SAMRAD system.

**7.3.5 Information regarding objections received.**

Please refer to the issues already discussed in the above paragraphs.

**7.4 The manner in which the issues raised were addressed.**

Please refer to the issues already discussed in the above paragraphs.

## 8 SECTION 39 (3) (c) of the Act: Environmental awareness plan.

### 8.1 Employee communication process

(Describe how the applicant intends to inform his or her employees of any environmental risk which may result from their work).

#### ***ACTION PLAN AND TIME SCHEDULE***

The mitigation measures indicated in **Table 24 (Operational Phase Mitigation Measures)** are implemented on a continuous basis. The time schedule as indicated in **Table 26 (Frequency of Mitigation Measures)** will apply.

#### ***PROCEDURES FOR ENVIRONMENTAL EMERGENCY INCIDENTS***

The following procedures must be made known to all employees:

##### ***HYDROCARBON SPILLS***

The leakage of hydrocarbons from vehicles, containers etc. can cause the pollution of soil, groundwater and surface water. In the event of a hydrocarbon spill, the following steps must be taken:

- a) Management must be notified immediately.
- b) The responsible person must immediately assess the extent of the spill.
- c) If possible, the contaminated soil must be treated *in situ*.
- d) If *in situ* treatment is not possible, all contaminated soil must be removed and disposed of at an approved disposal facility in an appropriate manner

##### **Slope Failure**

In the event of slope failure on stockpiles or in the quarry pit, the following steps must be taken:

- a) Management must be notified immediately.
- b) The responsible person must immediately assess the risk to personnel.
- c) If needed, all mining activities in proximity to the incident must be ceased.
- d) A suitably competent person must be appointed to take the necessary steps to ensure the safety of personnel.
- e) The failed area must be repaired if needed.

- f) If the area is declared safe, mining activities can continue.

### ***MONITORING AND ENVIRONMENTAL PERFORMANCE ASSESSMENTS***

The following monitoring procedures will be implemented at the mine in order to ensure compliance with this document, as well as relevant legislation. The monitoring procedures are implemented to ensure that the mitigation measures implemented are successful.

#### **Dust Level Monitoring**

The dust levels on site as well as at the potential dust impact sites must be monitored on an annual basis by means of dust fallout sampling or any other appropriate measure. This will ensure that current management strategies are sufficient, or need to be upgraded.

#### **Noise Level Monitoring**

The monitoring of noise levels on-site as well as at the potential noise impact sites during the annual monitoring and auditing session is recommended.

#### **Storm water Monitoring**

The effectiveness of the storm water control measures over the whole mine will be audited annually. If any shortfalls are identified they will be rectified with the appropriate physical and management measures. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.

#### ***Storm water Management Plan***

- Diversion berms must be secured around the quarry face to ensure that no storm water runs into the workings.
- Where any cut operation is practised or where soil is exposed for long periods, appropriate storm water control measures will be implemented.
- In the rehabilitation phase, topsoil should be replaced along the contours wherever possible. This will assist in storm water control by reducing water flow down slope and increasing water storage. Topsoil should be replaced and vegetated as soon as possible after construction has been completed.
- Plan for the worst case scenario, that is for heavy rainfall and runoff events, or high winds. Appropriate storm water control measures must be implemented around the access tracks and construction areas and a monitoring programme established to ensure that no erosion is taking

place. At the first sign of erosion the necessary remedial action must be taken.

- Care must be taken to ensure that runoff is well dispersed so as to limit erosion caused by storm water.
- All disturbed sites should be re-vegetated and rehabilitated immediately after construction so as to limit the exposure of the disturbed areas to wind and water erosion.

### **Water Quality Monitoring**

The surface water in the pit will be analysed twice a year to ensure that the groundwater quality does not deteriorate. Should deteriorating water quality levels be revealed, further appropriate mitigation measures will be implemented.

### **Vegetation Monitoring**

It is recommended that six monthly monitoring sessions be undertaken on disturbed areas where topsoil was restored and re-vegetated. This monitoring is to assess the success of the re-vegetation. During these monitoring sessions additional measures such as invader control, fertilisation and erosion control can be implemented if necessary.

### **Performance Assessment of EMPlan**

A performance assessment will be conducted every second year to determine the mine's compliance with the approved EMPlan. Any management measures found to be inadequate will be re-evaluated and amended to ensure effective environmental management. The following aspects will specifically be assessed:

- a) Compliance with current legislation.
- b) Compliance with mitigation measures as indicated in the approved EMPlan.
- c) Compliance with monitoring measures as indicated in the approved EMPlan.
- d) Review of the financial provision for rehabilitation.
- e) The occurrence and spread of invader plant species will be assessed, mapped and an eradication programme will be proposed.

This Environmental Performance Assessment Report will be submitted to the DMR.

## ***GENERAL MITIGATION AND MANAGEMENT MEASURES***

The following general management measures will be put in place and communicated to all personnel.

Visual inspection on the stability of all slopes must be done on a weekly basis.

### **8.2 Description of solutions to risks**

(Describe the manner in which the risk must be dealt with in order to avoid pollution or degradation of the environment) t.

Please see 8.1 for solutions to risks.

### **8.3 Environmental awareness training.**

(Describe the general environmental awareness training and training on dealing with emergency situations and remediation measures for such emergencies).

See 8.1 for Environmental awareness training.

**9 SECTION 39 (4) (a) (iii) of the Act: Capacity to rehabilitate and manage negative impacts on the environment.**

**9.1 The annual amount required to manage and rehabilitate the environment.**

(Provide a detailed explanation as to how the amount was derived)

**Environmental cost estimate.**

ACTIVITY Mark with X which activities are applicable		POTENTIAL IMPACT	MITIGATION MEASURE	STATE QUARTERLY COST OF MITIGATION MEASURES IN THE AVAILABLE SPACE BELOW, IN RANDS	STATE THE ESTIMATED REHABILITATION COST RELATED TO THE ACTIVITY IN THE AVAILABLE SPACE BELOW, IN RANDS
Excavating	X	Surface disturbance	Rehabilitation		10000
		Dust	Dust control measures	3000	
		Noise	Noise control measures	2500	
		Contaminated Drainage	Storm water system	2000	
Blasting		Fly Rock	Access control measures		
Stockpiles		Surface disturbance	Rehabilitation		
		Dust	Dust Control Measures		

		Contaminated Drainage	Storm water system		
<b>Discard dumps or dams</b>		Surface Disturbance	Rehabilitation		
		Dust	Dust control Measures		
		Contaminated Drainage	Storm water system		
<b>Loading, hauling and transport</b>	X	Noise	Noise control measures	2500	
		Dust	Dust control Measures	3000	
<b>Water supply dams and boreholes.</b>	X	Surface disturbance	Rehabilitation		3500
<b>Accommodation, offices, ablution, stores, workshops etc.</b>	X	Surface disturbance	Rehabilitation		14000
<b>Processing Plant</b>		Noise	Noise control measures		
		Dust	Dust control Measures		
		Contaminated Drainage	Storm water system		

		Surface disturbance	Rehabilitation		
			<b>TOTAL</b>	13000	27500

**9.2. Confirmation that the stated amount correctly reflected in the Prospecting Work Programme or the FINANCIAL AND TECHNICAL COMPETENCE REPORT as required**

Yes, it was taken from the Prospecting Work Programme.

**10 REGULATION 52 (2) (h): Undertaking to execute the environmental management plan.**

<p>Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.</p>	<p><b>Full Names and Surname</b></p>	<p>Werner Harms</p>
	<p><b>Identity Number</b></p>	<p>6211165030088</p>

**-END-**