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## mineral resources

Department:  
Mineral Resources  
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: RAUBEX CONSTRUCTION (PTY) LTD

REFERENCE NUMBER: FS30/5/1/3/2/10077MP

# ENVIRONMENTAL MANAGEMENT PLAN

**SUBMITTED**

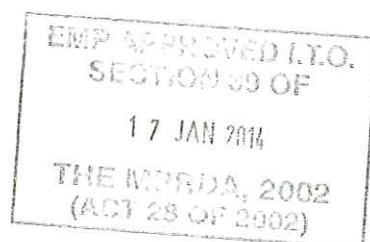
**IN TERMS OF SECTION 39 AND OF REGULATION 52  
OF THE MINERAL AND PETROLEUM RESOURCES  
DEVELOPMENT ACT, 2002,  
(ACT NO. 28 OF 2002) (the Act)**

Prepared For:

Raubex Construction (Pty) Ltd  
82/10924/07  
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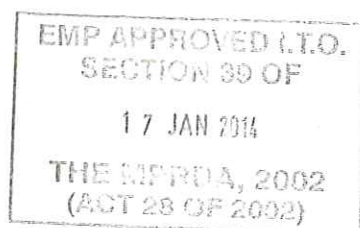
Prepared By:

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## STANDARD DIRECTIVE

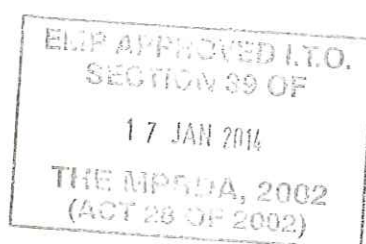
Applicants for prospecting rights or mining permits, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an Environmental Management Plan strictly in accordance with the subject headings herein, 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.

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## 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.

### LAND USE:

The remainder of the farm Leratong 835 District Thaba Nchu is situated in an agricultural setting approximately 10km from west of Thaba Nchu. The land use on the farm and surrounding areas are mainly for agricultural purposes. The N8 passes the proposed mining site to the north. The proposed mining area will be established on the northern side of the property  $\pm 150\text{m}$  from the boundary fence of the farm.

### GEOLOGY:

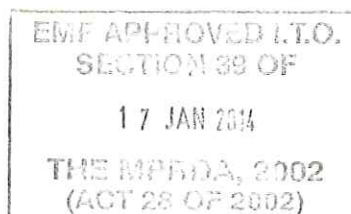
According to Mucina and Rutherford sedimentary mudstones and layers of sandstone are mainly of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) as well as those of the Ecca Group (also Karoo Supergroup) found in the extreme northern section of this grassland, giving rise to vertic, melanic and red soils typical of Dc land type (dominating the landscape). The less common intrusive dolerites of the Jurassic Karoo Dolerite Suite support dry clayey soils typical of the Ea land type.

The applicant intent to mine aggregate from the proposed site situated next to ridge on the higher ground of the farm. This area was chosen because of the shallowness of the rock and the fact that less overburden would need to be removed before the minable material could be reached.

### VEGETATION:

The vegetation type of the area is classified as the Central Free State Grassland (Veld type Gh 6, Mucina and Rutherford, 2006), and is characterized by undulating plains supporting short grassland, in natural condition dominated by Themeda triandra while Eragrostis curvula and E. chloromelas become dominant in degraded habitats. Dwarf karoo bushes establish in severely degraded clayey bottomlands. Overgrazed and trampled low-lying areas with heavy clayey soils are prone to Acacia karoo encroachment.

The vegetation of the area earmarked for the proposed mining activities is representative of the Central Free State Grassland and has not previously been disturbed by mining related activities. The applicant would have to remove the vegetation of the area prior to



commencement with the mining activities. Although no sensitive, protected or endangered species could be identified during the site inspection, it is proposed that the applicant remove as little vegetation as possible. This will lessen the area that needs to be managed for erosion and weed invasion purposes as well as reduce the impact that the proposed activity will have on the vegetation. Topsoil management should be implemented to ensure that topsoil is available upon rehabilitation of the area.

#### FAUNA:

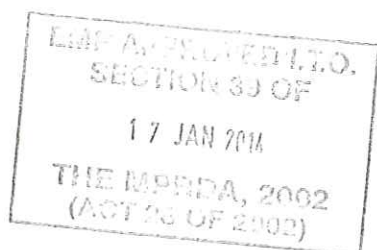
The fauna at the site will not be impacted by the proposed mining activity as they will be able to move away or through the site, without being harmed. Workers should be educated and managed to ensure that no fauna at the site is harmed. Upon commencement of the proposed mining activities, the mining area should be fenced to prevent roaming animals moving through the area falling into the quarry.

#### AIR QUALITY AND NOISE:

Dust will be generated by the proposed operation, but will be localised. Dust suppression measures should be implemented to prevent excessive dust on site. General air quality at the mine is good during normal weather conditions. A gravimetric dust-sampling and fallout dust-sampling programme will be followed on site. The results of these tests will be made available to the Department of Minerals and Energy on a quarterly basis. Sources of dust are the heavy vehicles that travel on the mine's roads, dust from blasting and dust from some of the stockpiles on the site. Dust pollution during very windy spells is significant and difficult to suppress.

The surrounding areas are characterised by an agricultural setting in which vehicles and farm equipment operate. The traffic on the N8 contributes to the ambient noise of the area. The noise to be generated at the proposed quarry operation is expected to increase the noise levels of the area. Noise from blasting is loud but occurs irregularly. The type, duration and timing of the blasting procedures will be planned with due cognisance of other land users and structures in the vicinity.

Blasting noise will be instantaneous and of short duration. Crushing and transportation of the material will however generate noise daily. Mitigation measures should be implemented to lessen the noise impact of the proposed activity on the surrounding environment.



The crushing plant is the main and most serious source of noise. The vehicles that work and travel in and around the mine generates noise levels that are comparable to the noise levels in the general area.

#### ARCHAEOLOGICAL AND CULTURAL INTEREST:

No sites of archaeological or cultural importance were identified during the site inspection. Consultation with the interested and affected parties also did not identify any potential area of concern. The activity is not anticipated to have a negative impact on any archaeological or cultural aspects. An archaeological study will be undertaken in order to confirm the above.

#### SURFACE AND GROUND WATER:

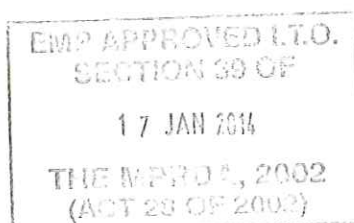
The proposed mining area will be further than 100m from any natural water source. A stream passes the farm to the east ( $\pm 500\text{m}$ ) this water course are more than 500m from the proposed mining area, and the mining activities are not anticipated to have a negative impact on the surface or ground water of the area. Stormwater will need to be channelled around the mining area to prevent possible contamination of clean water flowing over dirty areas. This applicant will get approval from water affairs prior to the use of any water.

Due to the location of the site against the ridge on the higher ground of the farm no open water courses are present in the rocky part of the farm.

#### VISUAL EXPOSURE:

The proposed mining area will be operated in a greenfield area not previously disturbed by mining activities, and will therefore have a visual impact on the surrounding environment. The vegetation present at the site will assist in the screening of the activities to mitigate the visual impact of the activity.

The mining activities will be clearly visible from the N8. The applicant should however ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the mine. Upon closure of the quarry and decommissioning of the site, the area should be fully rehabilitated and all exposed areas should be seeded to enhance vegetation recovery.



Upon closure the site will be rehabilitated and sloped to insure that the visual impact on the aesthetic value of the area is kept to a minimum. If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that all exposed areas should be seeded to enhance vegetation recovery. The site will have a neat appearance and be kept in good condition at all times.

Stockpiling will increase the visual impact in the area but will be localised to reduce the amount of stockpile heaps by rather have less heaps which is between a height of 5 - 10 m than several low heaps.

#### SOCIO-ECONOMIC:

Approximately 26 workers, will be employed at the site. The workers will be sourced from the local community. Workers will daily be transported to the site. The establishment of the mining area on the farm will also assist the property owner in the diversification of their income. The material to be sourced from the mining area will be used for the upgrading of the road infrastructure in the vicinity of the site, especially the N8, and will therefore contribute to infrastructure development and indirectly to the economy of the area.

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

Only one specific environmental feature has been identified on site that would require protection:

- Only demarcated areas should be disturbed and must be rehabilitated as soon as possible.
- If topsoil is present it will be removed before commencement of the mining activities and will be stored.
- No specific environmental features could be identified that need to be protected at the specific site.

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

See Appendix A for the requested map.



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,

During the planning phase and public participation process the community, in particularly the landowner and site manager, were contacted to obtain information about the site and the surrounding environment. This information was incorporated into the EMP. The information in the EMP was also confirmed during a site inspection conducted by Greenmined Environmental and the Applicant.

## 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.

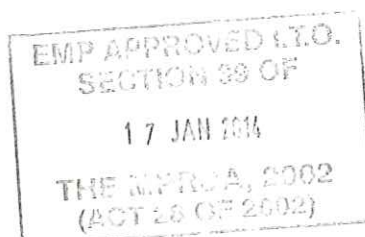
#### 2.1.1 The main mining activities (e.g. access roads, topsoil storage sites and any other basic mining design features )

The proposed mining site will entail the winning of aggregate by Raubex Construction (Pty) Ltd. The GPS Coordinates for the proposed site is:

- A 29.189337°S; 26.617684°E
- B 29.188598°S; 26.618768°E
- C 29.189794°S; 26.622745°E
- D 29.190533°S; 26.619319°E

Raubex Construction (Pty) Ltd intends to loosen the aggregate material by blasting, upon which it will be mechanically recovered with drilling-, excavating- and earth-moving equipment. A crushing and screening plant will also be present at the mining area. The rock that is recovered will be loaded on tipper trucks from where it will be transported to the crusher plant, screened and stockpiled. Transportation of the final product will be from the stockpile area to the client by means of trucks. All mining will take place within the boundaries of the application.

Blasting will occur once every two to three weeks. The noise caused by blasting will be instantaneous and of short duration. The applicant should however ensure that all residents





are informed of each blasting event in writing. Written notification should be substituted with verbal warnings before blasting takes place.

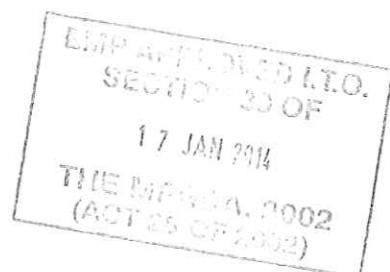
The proposed mining area is 4.9 ha in extent and the mine-able material occurs at an average depth of 15 metres.

The mining activities will consist of the following:

- Stripping and stockpiling of topsoil
- Blasting
- Excavating
- Crushing
- Stockpiling and transporting
- Sloping and landscaping during rehabilitation
- Replacing the topsoil

The infrastructure at the mining area will consist of the following:

- Containers to be used as offices and storage areas
- 1 x 60 ton Weigh Bridge
- Temporary Vehicle Service Area with plastic sheeting protection and big drip trays
- Mobile Crushing Plant
- The mining site will not have any accommodation infrastructure or power lines at the site.
- Fuel storage areas ( 2 Mobile bunded diesel tanks with 23 000l capacity each)
- Ablution facilities will consist of chemical toilets hired by a contractor and serviced weekly
- Generators on bunded areas
- Temporary vehicle service area for minor services



- Temporary Wash bay with plastic sheeting protection and big drip trays
- Hazardous waste storage area an external contractor will be contracted for waste removal

All diesel storage will be below the threshold as mentioned in the EIA regulations of the National Environmental Management Act, 1998 (Act No 107 of 1998) as amended June 2010, and the access road to the site will be less than 8meters wide and will also not trigger the NEMA regulations.

### 2.1.2 Plan of the main activities with dimensions

See requested plan attached as Appendix B.

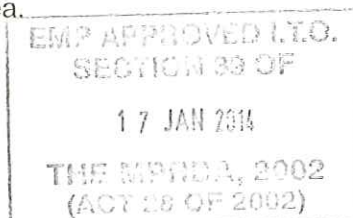
### 2.1.3 Description of construction, operational, and decommissioning phases.

#### CONSTRUCTION PHASE:

The construction phase for this project will entail site clearance and establishment of the mine infrastructure. This will entail bush clearance, removal and stockpiling of the topsoil, the placement of the containers, introduction of the mining equipment and the fencing of the site. Although the existing farm road to the area will be used to provide the applicant with access, the road needs to be upgraded in order to allow transportation of the mining equipment, vehicles and material to and from site. The applicant must ensure that the width of the road is less than 8m. If the road is wider than 8m the EIA regulations of the National Environmental Management Act, 1998 (Act No 107 of 1998) will be triggered and Environmental Authorisation needs to be obtained.

#### OPERATIONAL PHASE:

During the operational phase Raubex Construction (Pty) Ltd intends to loosen the gravel material by blasting, upon which it will be mechanically recovered with drilling-, excavating- and earth-moving equipment. Only demarcated areas will be disturbed and must be rehabilitated as soon as possible. A mobile crushing and screening plant will be present at the mining area. The gravel that is recovered will be loaded on tipper trucks from where it will be transported to the crusher plant, screened and stockpiled. Transportation of the final product will be from the stockpile area to the client by means of trucks. All equipment will be placed within the previously mined area.



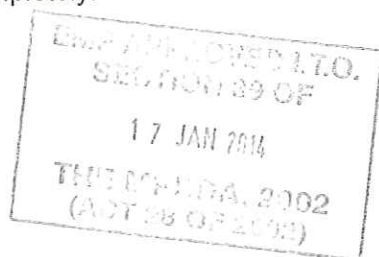
Blasting will occur once every two to three weeks. The noise caused by blasting will be instantaneous and of short duration. The site manager needs to ensure that all the surrounding residents are timeously notified of the blast. Proof of these notifications needs to be kept at the offices of the applicant. The type, duration and timing of the blasting should be planned with due cognisance of the other land users and structures in the vicinity. The integrity of the boundary fence should be closely monitored and any damages caused to the fence as a result of the mining activities, should be repaired by the applicant.

#### Soil:

- The topsoil present it will be removed before commencement of the mining activities and will be stored. The topsoil will be used to cover disturbed areas with a thin layer to enhance the establishment of natural vegetation. The necessary measures will be put in place to limit erosion from the stockpiles and to divert storm water away from the topsoil stockpiles. Rehabilitation would be done in such a way to ensure the least impact on the geology and soil characteristics.
- If any soil is contaminated during the life of the mine or during closure, it will be removed together with the contaminant and placed in acceptable containers to be removed with the industrial waste to a recognized facility and by a recognized company. No contaminated soil will be treated on site.
- Vehicle movement will be confined to established roads (no braiding of roads will be allowed) as to prevent the unnecessary disturbance and compactions of soils.
- Runoff water will be diverted around the site with trenches and contour structures to prevent erosion of the work areas.
- Where the soil is compacted it will be ripped and levelled in order to re-establish a growth medium upon closure of the site.

#### Vegetation:

- Management will take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods will be used:
  - "The plants will be uprooted, felled or cut off and can be destroyed completely."



- "The plants will be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide."
- Vegetation on flat surfaces will be established using the dry lands technique requiring no irrigation.
- Mining operations will be audited on a monthly basis. If any incidents, impacts to the environment or non-compliance are found it will be rectified immediately.
- Collection of wood for fire will not be allowed.
- The making of fires will not be allowed.
- Any sensitive plants identified by the environmental control officer in the proposed mining area will be removed prior to disturbance of the area.

#### Topography:

- The worked out areas will be sloped to blend with the associated topography.

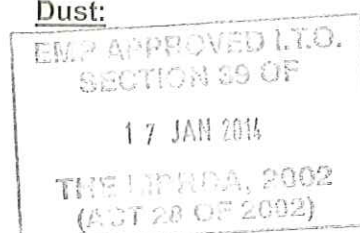
#### Land Use:

- Access roads to the mining area will be established in consultation with the landowner and existing roads will be used as far as practicable.
- All new roads will be selected as far as possible to avoid watercourses and steep gradients. Adequate drainage and erosion protection in the form of cut-off berms or trenches will be provided where necessary.
- The roads to be established to the site will be below the threshold of the EIA regulations of the National Environmental Management Act, 1998 (Act No 107 of 1998) as amended June 2010.

#### Sites of Archaeological and Cultural interest:

- If any artefacts of archaeological or cultural interest are found, the area will be marked and all activities in that vicinity would cease with immediate effect.

#### Dust:



- Roads will be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.

#### Fauna:

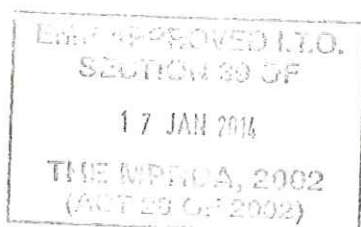
- Any form of poaching by workers on the mine will result in the maximum form of punishment as allowed for by common law. Any form of snares or traps will be removed.

#### Surface water:

- A system consisting of trenches will be put in place that will be able to divert run-off from the peak precipitation event of 1:100 years recurrence interval around the mining areas.
- Any vehicle repairs will only take place within the service bay area and all waste products will be disposed of in a 200 litre container/bin found inside the emergency service area.
- All refuelling will only take place in the service bay area. If this is found not to be feasible drip pans will be used whenever refuelling takes place.
- All infrastructures will be properly designed to allow for proper drainage and run-off without resulting in erosion features.
- Water management structures such as trenches and embankments will be inspected and evaluated at monthly intervals and after a storm event. These structures will be maintained through regular silt removal and the removal of aquatic weeds and reeds.

#### The mine area:

- The mining area will be clearly demarcated by means of beacons at its corners, and along its boundaries if there is no visibility between the corner beacons.
- Permanent beacons will be firmly erected and maintained in their correct position throughout the life of the operation.
- Mining and resultant operations shall only take place within this demarcated area.



- The mining area will be fenced.

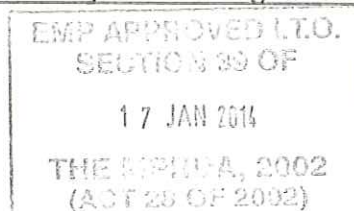
#### Access roads:

- Although the existing farm road to the area will be used to provide the applicant with access, the road needs to be upgraded in order to allow transportation of the mining equipment, vehicles and material to and from site.
- Should a portion of the access road be newly constructed the following will be adhered to:
  - The route will be selected that a minimum number of bushes or trees are felled and existing fence lines will be followed as far as possible.
  - Watercourses and steep gradients will be avoided.
  - Adequate drainage and erosion protection in the form of cut-off berms or trenches will be provided where necessary.

#### Ablution facilities, waste water & refuse disposal:

- Chemical toilets will be put on site for employees and proper hygiene measures will be established.
- Any effluents containing oil, grease or other industrial substances will be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
- Spills would be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., will be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognised landfill site. Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the mine area.
- Biodegradable refuse generated will be handled as indicated above.

#### Vehicle maintenance yard & storage areas:



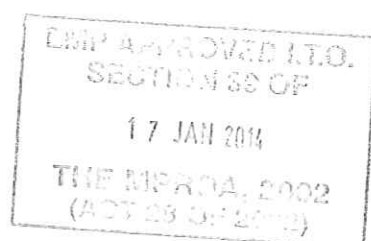
- The area chosen for these purposes will be the minimum reasonably required and involve the least disturbance to tree and plant life. Topsoil will be handled as described above. After the topsoil has been removed the area is covered with a plastic lining, covered with gravel material and compacted.
- Fuel and oil will be stored in a secured area.
- The maintenance of vehicles and equipment used for any purpose during the mining operation will take place only in the maintenance yard area.
- Equipment used in the mining process will be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the mining area will not constitute a pollution hazard in respect of the above substances. The Regional Manager may order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.

#### **DECOMMISSIONING PHASE:**

The decommissioning phase will entail the rehabilitation of the site. Upon cessation of the mining activities, the area will be fully rehabilitated. The sides of the excavation will be sloped with acceptable contours (40°) to prevent soil erosion or stepped by creating benches of not more than 3 meter. All roads used will be repaired or rehabilitated if not needed by the landowner. The applicant will comply with the minimum closure objectives as prescribed by DMR and detailed below.

#### **Rehabilitation of the excavated area:**

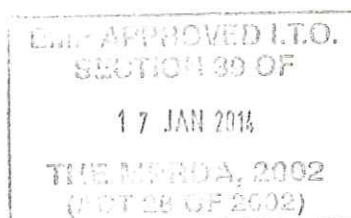
- Rocks and coarse material removed from the excavation must be dumped into the excavation.
- No waste will be permitted to be deposited in the excavations.
- Once excavations have been refilled with overburden, rocks and coarse natural materials and profiled with acceptable contours and erosion control measures, the topsoil previously stored shall be returned to its original depth over the area.



- The area shall be fertilized if necessary to allow vegetation to establish rapidly. If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.

**Rehabilitation of plant, office and service areas:**

- The layer of material at the vehicle service area will be removed and if contaminated with hazardous substances such as hydrocarbons will be disposed of as hazardous waste by an appropriately qualified waste handling contractor, the plastic liner will be removed to be used at a later stage. The compacted areas will be ripped and the topsoil returned over the area.
- Coarse natural material used for the construction of ramps will be removed and dumped into the excavations.
- Stockpiles will be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.
- On completion of operations, all structures or objects shall be dealt with in accordance with Section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
  - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
  - The site shall be seeded if necessary with a vegetation seed mix adapted to reflect the local indigenous flora.
- Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

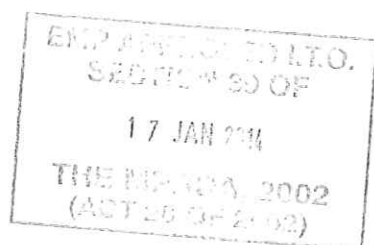




- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 300mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- Prior to replacing the topsoil the overburden material that was removed from these areas will be replaced in the same order as it originally occurred.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the area shall then be fertilized to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix if necessary.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to his or her specification.

**Final rehabilitation:**

- Rehabilitation of the surface area shall entail landscaping, leveling, top dressing, land preparation, seeding (if required) and maintenance, and weed / alien clearing.
- All infrastructure, equipment, plant, temporary housing and other items used during the mining period will be removed from the site (section 44 of the MPRDA).
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
- Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1 weeds according to CARA (Conservation of Agricultural Recourses Act, 1983 – Act 43; Regulations 15 & 16 (as amended in March 2001) need to be eradicated from the site.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.



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

The proposed mining activities at the site do not trigger listed activities in terms of the NEMA EIA regulations.

### 2.2 Identification of potential impacts

(Refer to the guideline)

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

##### Stripping and stockpiling of topsoil:

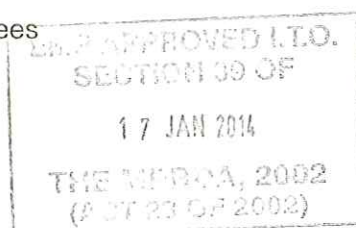
- Visual intrusion associated with the establishment of the mining area
- Dust nuisance caused by the disturbance of the soil
- Noise nuisance caused by machinery stripping and stockpiling the topsoil
- Infestation of the topsoil heaps by weeds or invader plants
- Loss of topsoil due to incorrect storm water management
- Contamination of area with hydrocarbons or hazardous waste materials

##### Blasting:

- Health and safety risk posed by blasting activities
- Dust nuisance caused by blasting activities
- Noise nuisance caused by blasting activities

##### Excavations:

- Visual intrusion associated with the excavation activities
- Dust nuisance due to excavation activities
- Noise nuisance generated by excavation equipment
- Contamination of surface or groundwater due to effluent runoff from excavation area
- Unsafe working conditions for employees



- Negative impact on the fauna and flora of the area
- Potential damage to cultural or heritage aspects
- Contamination of area with hydrocarbons or hazardous waste materials
- Weed and invader plant infestation of the area

**Crushing:**

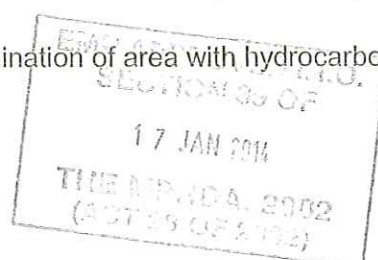
- Dust nuisance due to the crushing activities
- Noise nuisance generated by the crushing activities
- Contamination of area with hydrocarbons or hazardous waste materials

**Stockpiling and Transporting:**

- Visual intrusion associated with the stockpiled material and vehicles transporting the material
- Loss of material due to ineffective stormwater handling
- Weed and invader plant infestation of the area due to the disturbance of the soil
- Dust nuisance from stockpiled material and vehicles transporting the material
- Degradation of access roads
- Noise nuisance caused by vehicles
- Contamination of area with hydrocarbons or hazardous waste materials

**Sloping and Landscaping during rehabilitation:**

- Soil erosion
- Health and safety risk posed by un-sloped areas
- Dust nuisance caused during sloping and landscaping activities
- Noise nuisance caused by machinery
- Contamination of area with hydrocarbons or hazardous waste materials



### Replacing the Topsoil and Re-Vegetating the Disturbed Area:

- Loss of reinstated topsoil due to the absence of vegetation
- Infestation of the area by weed and invader plants

#### **2.2.2 Potential cumulative impacts**

The proposed mining activity will entail the establishment of a mining area in a greenfield area not previously disturbed for mining activities. The disturbance of the natural areas must be contained within the boundaries of the site.

The cumulative impacts associated with the addition of mining as land use to the area was identified to be the following:

- Additional traffic on the local roads during construction and operational phases,
- The influx of people into the area during construction and operational phases,
- Additional water supply to the area.

#### **2.2.3 Potential impact on heritage resources**

No sites of archaeological or cultural importance were identified during the site inspection. Consultation with the interested and affected parties also did not identify any potential area of concern. The activity is not anticipated to have a negative impact on any archaeological or cultural aspects. An archaeological study will be undertaken in order to confirm the above.

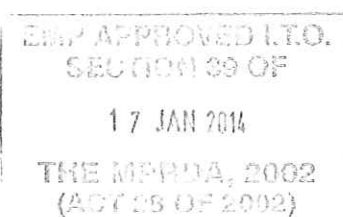
#### **2.2.4 Potential impacts on communities, individuals or competing land uses in close proximity.**

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

The proposed quarry will be established in an area not currently utilised for any specific use. The quarry will therefore not have to compete with other land uses at the site.

Upon closure of the mining area, a portion of the land will revert back to agriculture and the area could be used for the grazing of animals.

The mining operation could have the following negative impacts on the community:



- Dust nuisance due to crushing of material
- Noise nuisance due to mining operations
- Loss of land to be used for farming purposes if the quarry area is not rehabilitated
- Safety hazard to humans and fauna in the area, if the quarry is not safely rehabilitated
- Visual impact if the slopes of the quarry are not rehabilitated.

The operation of the mine will however have a number of positive impacts such as job creation for approximately 26 workers from the local community. The aggregate to be removed from the quarry will be used for road construction in the vicinity. The proposed quarry will therefore contribute to the upgrading/maintenance of infrastructure in and around Thaba Nchu area.

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

The management of the potential impacts such as dust suppression, noise control and waste handling were included in the notification letter send to the I&AP's and stakeholders informing them of the proposed mining activity. The I&AP's and stakeholders were requested to submit any additional comments. To date no additional comments were received. The applicant will obtain an agreement with the landowner for the duration of the mining activities prior to commencement of mining activities.

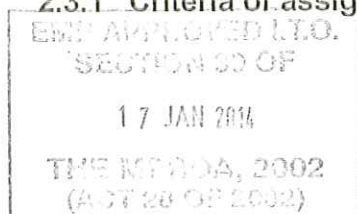
#### **2.2.6 Confirmation of specialist report appended.** (Refer to guideline)

No specialist report was done to date.

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

### **2.3 Assessment of the significance of the potential impacts**

#### **2.3.1 Criteria of assigning significance to potential impacts**



## Methodology for the assessment of the potential environmental, social and cultural impacts

### DEFINITIONS AND CONCEPTS:

#### Environmental significance:

The concept of significance is at the core of impact identification, evaluation and decision-making. The concept remains largely undefined and there is no international consensus on a single definition. The following common elements are recognised from the various interpretations:

- Environmental significance is a value judgement
- The degree of environmental significance depends on the nature of the impact
- The importance is rated in terms of both biophysical and socio-economic values
- Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of acceptability) (DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5).

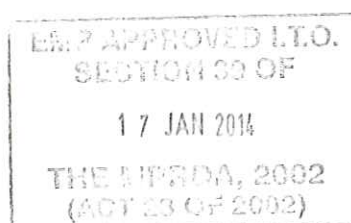
The concept of risk has two dimensions, namely the consequence of an event or set of circumstances, and the likelihood of particular consequences being realised (Environment Australia (1999) Environmental Risk Management).

#### Impact

The positive or negative effects on human well-being and / or the environment.

#### Consequence

The intermediate or final outcome of an event or situation OR it is the result, on the environment, of an event.



Likelihood

A qualitative term covering both probability and frequency.

Frequency

The number of occurrences of a defined event in a given time or rate.

Probability

The likelihood of a specific outcome measured by the ratio of a specific outcome to the total number of possible outcomes.

Environment

Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation (ISO 14004, 1996).

Methodology that will be used

The environmental significance assessment methodology is based on the following determination:

$$\text{Environmental Significance} = \text{Overall Consequence} \times \text{Overall Likelihood}$$

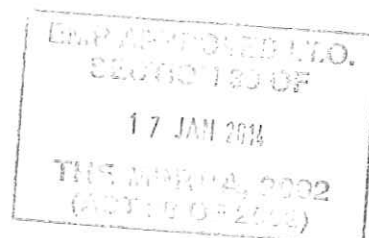
Determination of Overall Consequence

Consequence analysis is a mixture of quantitative and qualitative information and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: *Severity/Intensity, Duration and Extent/Spatial Scale*. Each factor is assigned a rating of 1 to 5, as described in the tables below.

Determination of Severity / Intensity

**Severity** relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects impact on the biophysical and socio-economic environment.

Table 1 will be used to obtain an overall rating for severity, taking into consideration the various criteria.



## Rating of Severity:

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignificant / Non-harmful	Small / Potentially harmful	Significant/ Harmful	Great/ Very harmful	Disastrous / Extremely harmful
Social/ Community response	Acceptable / I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ Sporadic complaints	Unacceptable / Widespread complaints	Totally unacceptable / Possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance/ Easily reversible	Low cost to mitigate	Substantial cost to mitigate/ Potential to mitigate impacts/ Potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible
Biophysical (Air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change / deterioration or disturbance	Moderate change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

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***Determination of Duration***

Duration refers to the amount of time that the environment will be affected by the event, risk or impact, if no intervention e.g. remedial action takes place.

**Rating of Duration:**

Rating	Description
1	Up to ONE MONTH
2	ONE MONTH to THREE MONTHS (QUARTER)
3	THREE MONTHS to ONE YEAR
4	ONE to TEN YEARS
5	Beyond TEN YEARS

***Determination of Extent/Spatial Scale***

Extent or spatial scale is the area affected by the event, aspect or impact.

**Rating of Extent / Spatial Scale:**

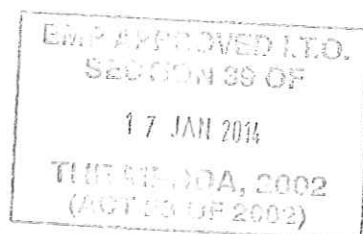
Rating	Description
1	Immediate, fully contained area
2	Surrounding area
3	Within Business Unit area of responsibility
4	Within the farm/neighboring farm area
5	Regional, National, International

***Determination of Overall Consequence***

Overall consequence is determined by adding the factors determined above and summarized below, and then dividing the sum by 3.

**Example of calculating Overall Consequence**

Consequence	Rating
Severity	Example 4
Duration	Example 2
Extent	Example 4
<b>SUBTOTAL</b>	<b>10</b>
<b>TOTAL CONSEQUENCE:</b> (Subtotal divided by 3)	<b>3.3</b>

**Determination of Likelihood:**

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described below and in tables 6 and 7.

#### *Determination of Frequency*

Frequency refers to how often the specific activity, related to the event, aspect or impact, is undertaken.

#### Rating of Frequency:

Rating	Description
1	Once a year or once/more during operation
2	Once/more in 6 Months
3	Once/more a Month
4	Once/more a Week
5	Daily

#### *Determination of Probability*

Probability refers to how often the activity or aspect has an impact on the environment.

#### Rating of Probability

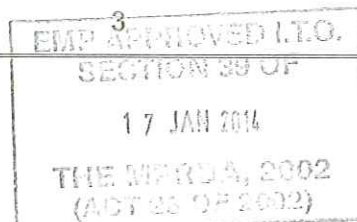
Rating	Description
1	Almost never / almost impossible
2	Very seldom / highly unlikely
3	Infrequent / unlikely / seldom
4	Often / regularly / likely / possible
5	Daily / highly likely / definitely

#### *Overall Likelihood*

Overall likelihood is calculated by adding the factors determined above and summarised below, and then dividing the sum by 2.

#### Example of calculating Overall Likelihood

Consequence	Rating
Frequency	Example 4
Probability	Example 2
<b>SUBTOTAL</b>	<b>6</b>
<b>TOTAL LIKELIHOOD</b> (Subtotal divided by 2)	<b>3</b>



### Determination of Overall Environmental Significance:

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of **LOW**, **LOW-MEDIUM**, **MEDIUM**, **MEDIUM-HIGH** or **HIGH**, as shown in the table below.

#### Determination of Overall Environmental Significance

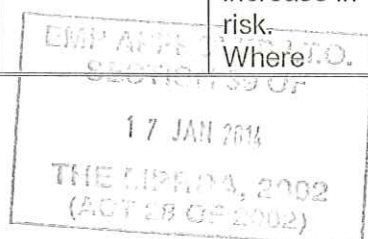
Significance or Risk	Low	Low-Medium	Medium	Medium-High	High
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25

#### Qualitative description or magnitude of Environmental Significance

This description is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritisations and decision making process associated with this event, aspect or impact.

#### Description of Environmental Significance and related action required

Significance	Low	Low-Medium	Medium	Medium-High	High
Impact Magnitude	Impact is of very low order and therefore likely to have very little real effect. Acceptable.	Impact is of low order and therefore likely to have little real effect. Acceptable.	Impact is real, and potentially substantial in relation to other impacts. Can pose a risk to company	Impact is real and substantial in relation to other impacts. Pose a risk to the company. Unacceptable	Impact is of the highest order possible. Unacceptable. Fatal flaw.
Action Required	Maintain current management measures. Where possible improve.	Maintain current management measures. Implement monitoring and evaluate to determine potential increase in risk. Where	Implement monitoring. Investigate mitigation measures and improve management measures to reduce risk, where possible.	Improve management measures to reduce risk.	Implement significant mitigation measures or implement alternatives.



		possible improve			
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Based on the above, the significance rating scale has been determined as follows:

High	Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.
Medium-High	Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
Medium	Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible, In case of positive impacts; other means of achieving these benefits would be about equal in time, cost and effort.
Low	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved or little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
Low-Medium	Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit

