

DEPARTMENT OF MINERALS AND ENERGY

ENVIRONMENTAL MANAGEMENT PLAN

Submitted in support of application for a prospecting right or mining permit. Section 39 and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)



Application for a:

Prospecting Right	
Mining Permit	✓

Applicant:.....Department of Water Affairs and Forestry (DWAf)

Farm:.....Springvale 2170

District:..... Mooi River

Mineral:Dolerite

Date:April 2007

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A.1 INTRODUCTION

This document aims to provide a simplified national standard for applicants for prospecting rights and mining permits to comply with the relevant legislation and environmental regulations as apply to their respective applications in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)(MPRDA).

Applicants in this sector of the mining industry typically disturb smaller surface areas of land, whether drilling boreholes, small trenches, or mining on a small area, less than 1,5 hectares of land, under a mining permit as contemplated in Section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

A.2 SCOPE

This document is intended for use by applicants for mining permits and prospecting rights. Typically, operations in this sector of the mining industry:

- Use little or no chemicals to extract mineral from ore,
- Work on portions of land of 1,5 hectares in size or smaller,
- Disturb the topography of an area somewhat but have no significant impact on the geology

A.3 PURPOSE

This document aims to:

- Provide a national standard for the submission of Environmental Management Plans for the types of applications mentioned above.
- Ensure compliance with Regulation 52 of the MPRDA.
- Assist applicants by providing the information that the Department of Minerals and Energy (DME) required in a simple language and in a structured, prescribed format, as contemplated in Regulation 52 (2) of the (MPRDA),
- Assist regional offices of the DME to obtain enough information about a proposed prospecting/ reconnaissance or mining permit operation to assess the possible environmental impacts from that operation and to determine corrective action even before such right is granted and the operation commences.

This document aims both to provide the DME regional offices with enough information about applicants for mining permits and applicants with guidance on environmental management matters pertaining to the mitigation of environmental impacts arising from their operations. Given this dual focus and the generic nature of the document, it might not be sufficient for all types of operations under various circumstances. The document may therefore be altered or added to as the particular circumstances of the application in question may require.

A.4 USE OF THE DOCUMENT:

This document is designed for use by non-professionals and newcomers to the environmental management industry and it incorporates a very *simple* Environmental Impact Assessment (EIA). The EIA is contained in Section C of this document and was designed specifically with the target sectors of the mining industry (described in A.2 above) in mind.

The aim is ultimately to (a) gather information from applicants themselves; (b) to assess the impact of the operation based on that information and then (c) to guide the applicant to mitigate environmental impacts to limit damage to the environment.

Section B of the document gathers demographic information about the applicant. Section C gathers the information that will be used in the Environmental Impact Assessment. The applicant must complete the relevant sections of this document, but the regional office of the DME will do the scoring of these for the impact assessment rating in Section D.

Section F (the Environmental Management Plan) of the document is prescriptive and gives guidance to the miner or prospector on how to limit the damage of the operation on the environment. This part may be added to by the regional manager, who has the prerogative to decide whether this Environmental Management Plan will adequately address the environmental impacts expected from the operation or whether additional requirements for proper environmental management need to be set. Where these additional requirements are set, they will appear in Section G of this document. The Environmental Management Plan (Section F) of the document is legally binding once approved and, in the undertaking contained in Section H, the applicant effectively agrees to implement all the measures outlined in this Environmental Management Plan.

A.5 LEGISLATION/ REGULATIONS

The relevant sections of Mineral and Petroleum Resources Development Act and its supporting Regulations are *summarized below* for the information of applicants. The onus is on the applicant to familiarize him/herself with the provisions of the full version of the Mineral and Petroleum Resources Development Act and its Regulations.

Section of Act	Legislated Activity! Instruction/ Responsibility or failure to <u>Comply</u>	Penalty in terms of Section 99
5(4)	No person may prospect, mine, or undertake reconnaissance operations or any other activity without an approved EMP, right, <u>permit or permission</u> or without notifying the land <u>owner</u>	R 100 000 or two years imprisonment or both
19	Holder of a Prospecting right must: lodge right with Mining Titles Office within 30 days; commence with prospecting within 120 days; comply with terms and conditions of prospecting right, and actively conduct prospecting operations; comply with <u>requirements of approved EMP a prospecting fees and royalties</u>	R 100 000 or two years imprisonment or both
20(2)	Holder of prospecting right must obtain Minister's permission to remove an mineral or bulk samples	R 100 000 or two years imprisonment or both

Section of Act	Legislated Activity/ Instruction/ Responsibility or failure to Comply	Penalty in terms of Section 99
26(3)	A person who intends to beneficiate any mineral mined in SA outside the borders of SA may only do so after notifying the Minister in writing and after consultation with the Minister.	contravention
28	Holder of a mining right or permit must keep records of operations and financial records AND must submit to the DG: monthly returns, annual financial report and a report detailing compliance with & labor plan and charter	R 100 000 or two years imprisonment or both
29	Minister may direct owner of land or holder/applicant of permit/right to submit data or information	R 10 000
38(1)(c)	Holder of permission/permit/right MUST manage impacts according to EMP and as ongoing art of the operations	R 500 000 or ten years imprisonment or both.
42(1)	Residue stockpiles must be managed in prescribed manner on a site demarcated in the EMP	A fine or imprisonment of up to six months or both
42(2)	No person may temporarily or permanently deposit residue on any other site than that demarcated and indicated in the EMP	A fine or imprisonment of u to six months or both
44	When any permit/right/permission lapses, the holder may not remove or demolish buildings, which may not be demolished in terms of any other law, which has been identified by the Minister o which is to be retained b agreement with the landowner.	Penalty that may be imposed by Magistrate's Court for similar offence
92	Authorized persons may enter mining sites and require holder of permit to produce documents/ reports/ or any material deemed necessary for inspection	Penalty as may be imposed far perjury
94	No person may obstruct or hinder an authorized person in the performance of their duties or powers under the Act.	Penalty as may be imposed for e'u
95	Holder of a permit/right may not subject employees to occupational detriment on account of employee disclosing evidence or information to authorized person official	Penalty as may be imposed for perjury
All sections	Inaccurate, incorrect or misleading information	A fine or imprisonment of up to six months or both
All sections	Failure to comply with any directive, notice, suspension, order, instruction, or condition issued	A fine or imprisonment of u to six months or both

A.6 OTHER RELEVANT LEGISLATION

Compliance with the provisions of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and its Regulations does not necessarily guarantee that the applicant is in compliance with other Regulations and legislation. Other legislation that may be immediately applicable includes, but are not limited to:

National Monuments Act, 1969 (Act 28 of 1969). National Parks Act, 1976 (Act 57 of 1976) Environmental Conservation Act, 1989 (Act 73 of 1989) National Environmental Management Act, 1998 (Act No. 107 of 1998) Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)

The National Water Act, 1998 (Act 36 of 1998)

Mine Safety and Health Act, 1996 (Act 29 of 1996)

The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

A.7 WORD DEFINITIONS

In this document, unless, otherwise indicated, the following words will have the meanings as indicated here:

Act (The Act)	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
Borehole	A hole drilled for the purposes of prospecting i.e. extracting a sample of soil or rock chips by pneumatic, reverse air circulation percussion drilling, or any other type of probe entering the surface of the soil.
CARA	The Conservation of Agricultural Resources Act
EIA	An Environmental Impact Assessment as contemplated in Section 38(1) (b) of the Act
EMP	an Environmental Management Plan as contemplated in Section 39 of the Act
Fauna	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
Flora	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
Fence	A physical barrier in the form of posts and barbed wire and/or 'Silex' or any other concrete construction, ('palisade type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
House being NODE	any residential dwelling of any type, style or description that is used as a residence by any human National Department of Agriculture
MAW	National Water Act, Act 36 of 1998
Pit	Any open excavation
'Porrel'	The term used for the sludge created at alluvial diamond diggings where the alluvial gravels are washed and the diamonds separated in a water-and-sand medium.
Topsoil	The layer of soil covering the earth which (a) provides a suitable environment for the germination of seed; (b) allows the penetration of water; (c) is a source of micro-organisms, plant nutrients and in some cases seed; and (d) is not of a depth of more than 0,5 meters or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.
Trench	A type of excavation usually made by digging in a line towards a mechanical excavator and not pivoting the boom - a large, U-shaped hole in the ground, with vertical sides and about 6 - 8 meters in length. Also a prospecting trench. Vegetation Any and all forms of plants, see also Fauna
DWAF	The Department of Water Affairs and Forestry - both national office and their various regional offices, which are divided across the country on the basis of water catchment areas.
MPRDA	the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan	An Environmental Management Plan as contemplated in Regulation 52 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) - this document.

B. BIOGRAPHIC DETAILS OF THE APPLICANT:

B 1.1 Full name (and surname) of person or company applying for permit or right	Department of Water Affairs and Forestry
B 1.2 ID number of person or company/ CC registration number	1966/00662821/21
B 1:3 Postal address	P. Bag X313
	Pretoria
	0001
B 1.4 Physical/ residential address	Department of Water Affairs and Forestry
	Schoeman Street
	Pretoria
	0001
B 1.5 Applicant's telephone number	012 336 8332
B 1.8 Applicant's cellular phone number	082 809 2014
B 1.7 Alternative contact's name	
B 1.8 Alternative contact's telephone/cell phone numbers	
B 2.1 Full name of the property on which mining / prospecting operations will be conducted	Springvale Farm 2170

B 2.2 Name of the subdivision	Subdivision 112
B 2.3 Approximate center of mining / prospecting area: Latitude	29.59.07 E
Longitude	29.18.36S
B 2.4 Magisterial district	Mooi River
2.5 Name of the registered owner of the property	Mr James Berning
2.6 His/her Telephone number	033-267 7031
2.7 His/ her Postal address	
2.8 Current uses of surrounding areas The main land use is cattle grazing and crop cultivation	

B 2.9 Are there any other, existing land uses that impact on the environment in the proposed mining/ prospecting area?	Yes
Farming activities	
2.10 What is the name of the nearest town?	Rosetta
Rosetta is situated 1 km north west from the proposed quarry site.	

B3: PROPOSED QUARRYING OPERATION
This section is structured as follows:
<ul style="list-style-type: none"> • Background to the need for the quarry • Determination of volumes of material needed for Spring Grove Dam • Proposed quarrying operation

Background to the need for the quarry

The Department of Water Affairs and Forestry (DWAF) intends implementing Phase 2 of the Mooi-Mgeni Transfer Scheme – Spring Grove Dam and Appurtenant Works (MMTS-2) in the Province of KwaZulu-Natal (KZN).

The Mgeni River Catchment (MRC) supplies water to about 5 million people and the industrial sector within the Durban and Pietermaritzburg regions which forms the economic hub of KwaZulu Natal. Water shortages in the region can have a significant negative impact on the regional economy giving rise to job losses to a large number of people. The MRC has until recently been the main water source from which water requirements of the eThekweni Metropolitan Municipality (i.e. Durban), Pinetown and Pietermaritzburg and surrounding areas have been supplied. The Mgeni River has been fully developed with the construction of four major dams since 1950, viz. Nagle (1950), Midmar (1965), Albert Falls (1976) and Inanda (1988). Prior to 1950 the Henley Dam (1943) on the Msinduzi River supplied water to Pietermaritzburg, but this dam was de-commissioned in 1994 for safety reasons. In addition to the major dams, numerous farm dams have also been built in the MRC making it fully developed with no further water resource development being possible. Future water augmentation would therefore need to be sourced from outside the catchment.

In 1983, the Mearns Emergency Transfer Scheme transferred water from the Mooi River at the Mearns Weir to the Mpofana River in the MRC upstream of Midmar Dam. Since 1983, various schemes to augment the Mgeni System have been investigated by DWAF in collaboration with Umgeni Water, one of the major bulk potable water suppliers of the region. A number of rivers in the area were considered for augmentation of the Mgeni System. Planning was done extensively by DWAF to investigate transferring water from either the Mooi or the Mkomazi rivers. DWAF found that the former would be a cheaper scheme with the least impact on the taxpayer and end-user.

In 1996 a comprehensive Mooi-Mgeni Transfer Scheme Pre-feasibility Study was initiated (MMTS), and subsequently completed in 1999. The aim was to identify the best scheme to develop on the Mooi river and to make recommendations. An analysis of the options has resulted in a closer examination of the feasibility of the Spring Grove Dam at Rosetta by carrying out an environmental impact assessment (EIA) of the proposed project. The EIA requires that all necessary permits and approvals are in place in order for the project to proceed. One of the processes in the construction of the Spring Grove Dam will be sourcing the required materials for the dam wall itself. During the pre-feasibility studies mentioned above, a geotechnical investigation was carried out to locate suitable reserves of dolerite which is needed for construction. One possible site was located on Springvale Farm near Rosetta (See Figure 1, Annexure 1).

In 2004, The Department of Water Affairs & Forestry was issued with an exemption from complying the requirements of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) by the Minister of Minerals and Energy (Government Gazette 25 June 2004). This exempts DWAF from applying for a mining permit. However, best practice means that the necessary documents must be compiled and submitted to the Department of Minerals and Energy for notification and information. The DME is not required to issue a permit or license.

This Environmental Management Plan is therefore prepared as a basis to notify and inform the DME on the proposed development of the Springvale Quarry in order to

provide dolerite for the construction of the Spring Grove Dam.

Determination of the volumes needed for Spring Grove Dam

The Council for Geoscience (July 1999) prepared a report titled Mooi –Mgeni Transfer Scheme, Spring Grove dam site. Feasibility level construction materials investigation.

This report clearly states the quantities of material that are required for construction of the dam and associated roadways.

MATERIAL TYPE	VOLUME IN m ³
EMBANKMENT MATERIAL	
• Impervious soil	100 000
• Semi pervious soil	140 000
• Pervious (gravel)	50 000
SAND AND GRAVEL	
• Filter sand	20 000
• Concrete sand	110 000
• Gravel (for roads)	150 000
AGGREGATE MATERIAL	
• Concrete coarse aggregate	250 000
• Concrete crusher sand (for 50/50 blend)	60 000
• Rockfill (toe drain)	20 000
• Rip Rap	25 000

The impervious and semi pervious soil will come from the borrow areas indicate on Figure 1 in the above report. It is expected that the remaining material will be sought at the Spring Vale Quarry. This amounts to a total volume of 685 000m³

QUARRY DEVELOPMENT

Volumes sited in existing report

The volume of material indicated as being available in the quarry is 900 000m³ with 300 000m³ of overburden being indicated. The volumes have been calculated “from the area beneath the boreholes.” It is therefore assumed that a thickness of 30m can be excavated over and area of 300m by 100m. The volume attained will be marginally more that required but there is sure to be wastage.

Considering the anticipated profile within the quarry

The overburden comprises a thin layer of topsoil and colluvium which reaches a thickness of 3m in places underlain by highly to moderately weathered siltstone and sandstone. The sidewall profile in the quarry can then be assumed to be 1 : 1 through the colluvium and vertical through the siltstone, sandstone and dolerite with 5m wide benches allowed every 10m of vertical height for slope stabilization measures. An estimate of the surface expression of the quarry needed to generate the required material is therefore 120m by 320m. A buffer zone of at least 5m all around would be required.

Which results in a cordoned off area of 130m x 330m for actual quarrying purposes.

Overburden

The thin layer of topsoil and colluvium will need to be stockpiled for later landscaping. The volume of this material would be approximately 100 000m³. This would bulk up by approximately 15% resulting in a stockpile volume of 115 000 m³. Considering a stockpile of 8m high with a side slope of 1 : 1, the footprint area

needed would be in the order of 60m x250m
Topsoil and colluvium stockpile = 50m x 250m

The remainder of the overburden is siltstone and sandstone. Although this has not been tested, it is considered that this material could be used as general fill and for use in road layers on the site. This would then negate the need for a “permanent” stockpile for this material. Should this material need to be stockpiled, and considering a bulk up on excavation of 50% a footprint area of 100m x 250m to a height of 12m would be required

Overburden rock stockpile = 100m x 250m

Proposed Quarrying Operation

Open pit mining will be used as the deposit is relatively shallow, and the dolerite dips steeply. The following sequence will be followed:

- The access road to the mine will be widened from Springvale Farm to the quarry using a bulldozer. No material will initially be placed on the road as the initial stage is the establishment of the mine.
- The mining site will be established by bringing in three shipping containers: one for the office, one for ablutions and 1 for stores. Tanks for water and fuel will be erected and chemical toilets will be established.
- The Black Wattle trees within the mine pit area will be removed. The wood from the trees will be made available to the local communities for use as firewood.
- The whole mine area will then be fenced and made secure.
- The top soil will be removed first and stockpiled to the west of the pit in three areas in the shape of a horseshoe (see Mine Layout Plan, Annexure 1). The stockpiles will have a maximum height of 8 metres.
- Overburden will be blasted and removed and stockpiled between the topsoil stockpile and the pit. It will be placed within the topsoil horseshoe. Some of the overburden may be used to upgrade the road to the mine from the R103.
- A small berm (1m) high will be constructed around the entire mine area for storm-water control. Water falling in the pit and the on the stockpiles will be collected and used for dust suppression. A storm-water tank is provided for to store this water. General shaping during quarry establishment will divert clean water away from the quarry, thereby separating clean and dirty water circuits.
- The pit will be formed by a series of benches and terraces arranged in a deepening spiral or in levels with interconnecting ramps. The pit will then be deepened in a sequential manner, using the benches as haul roads for the removal of the dolerite from the pit (See Figure 2, Annexure 1).
- Two options for the transport of the material were considered:
 - Trucks are loaded directly in the pit and these travel down the main mine road to the R103. From there the trucks turn right onto the R103. Approximately 500m down, the trucks will turn left into the D146. This road will need to be upgraded to cater for these trucks. This road leads to the dam construction site.
 - The second option was to install a conveyor system from the quarry to the dam construction site. The conveyor would run straight down the hill from the quarry on the south western side, travel within the tunnel underneath the railway line and then up and over the R103. It would run up a valley and turn off to the dam as indicated on Photograph 1. This option was however found to be too costly and was rejected as a feasible method.



C. ENVIRONMENTAL IMPACT ASSESSMENT:

The information provided in this section will enable officials to determine how serious the impact of the prospecting/mining operation will be.

DESCRIBE THE ENVIRONMENT THAT WILL BE AFFECTED BY THE PROPOSED PROSPECTING/MINING OPERATIONS UNDER THE FOLLOWING HEADINGS:

C.1 DESCRIPTION OF THE ENVIRONMENT LIKELY TO BE AFFECTED BY PROPOSED PROSPECTING/MINING OPERATIONS: (REGULATION 52(2)(a))			
ENVIRONMENTAL IMPACT/ FACTOR	VALUE	TICK	OFFICE USE
C 1.1 What does the landscape surrounding the proposed operation look like? (Open veldt/ valley/ flowing landscape/ steep slopes			

The quarry site is located on a prominent ridge on Springvale farm. The southeastern and southern boundaries of the ridge are bordered by the Springvale River which has cut the cliff face on the south side of the proposed quarry site. The proposed site lies just 1 km from the southeast of the Rosetta and 1,5 km east-southeast of the proposed dam centre line (See Figure 1, Appendix 2). The site is overgrown with black wattle trees, while the surrounding area is used for grazing (See Figure 3 and Photograph 1).



Figure 3: Aerial view of proposed quarry



Photograph 1: Panorama view of proposed quarry

C 1.2 Describe the type of soil found on the surface of the Site			
<p>Drilling results indicated that the topsoil/colluvium is approximately 5m thick. This is underlain by weathered overburden of siltstone and sandstone to a depth of 3 to 10m. The alternating siltstone and sandstone horizons are light brownish to yellowish grey colour. Below this is the dolerite sill approximately 33 m thick. The sill is essentially horizontal, with a sharp increase in dip towards the southwest. The sill did not intrude as a single unit, as a much narrower sill underlies the main dolerite sill.</p> <p>The dolerite sill can generally be classified into three zones on the basis of grain size. The upper most part is composed of very fine –grained dolerite representative of a chilled margin and tends to coarsen gradually with depth. This upper fine –grained zone varies from 2-3 m in thickness and consists of unweathered close to medium jointed, dark grey, very hard rock dolerite.</p> <p>The middle zone of the sill comprises unweathered, medium to widely jointed (with very localised zones of close jointing), dark grey with white speckles, massive, very hard rock, medium to coarse-grained dolerite.</p> <p>Underlying the dolerite sill is unweathered, medium to closely jointed, light grey with dark lamination, very hard rock, alternating siltstone and sandstone of the Estcourt Formation. The lithology exhibit similar joints sets to the overlying dolerite.</p>			
	VALUE	TICK	OFFICE USE
C 1:3 How deep is the topsoil?	0 – 300mm	X	0.5m
	300 – 600mm		
	600mm +		
C 1.4 What plants, trees and grasses grow naturally in the area around the site?			

The potential quarry area is situated in Moist Cool Highveld Grassland. The Grassland Biome is found chiefly on the high central plateau of South Africa, and the inland areas of Kwazulu-Natal and the Eastern Cape. The topography is mainly flat and rolling, but includes the escarpment itself. Altitude varies from near sea level to 2 850 m above sea level.

Grasslands (also known locally as Grassveld) are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. Trees are absent, except in a few localized habitats. Geophytes are often abundant. Frosts, fire and grazing maintain the grass dominance and prevent the establishment of trees.

There are two categories of grass plants: sweet grasses have a lower fibre content, maintain their nutrients in the leaves in winter and are therefore palatable to stock. Sour grasses have a higher fibre content and tend to withdraw their nutrients from the leaves during winter so that they are unpalatable to stock. At higher rainfall and on more acidic soils, sour grasses prevail, with 625 mm per year taken as the level at which unpalatable grasses predominate. C₄ grasses dominate throughout the biome, except at the highest altitudes where C₃ grasses become prominent.

Grass plants tolerate grazing, fire, and even mowing, well: most produce new stems readily, using a wide variety of strategies. Overgrazing tends to increase the proportion of pioneer, creeping and annual grasses, and it is in the transition zones between sweet and sour grass dominance that careful management is required to maintain the abundance of sweet grasses. The Grassland Biome is the mainstay of dairy, beef and wool production in South Africa. Pastures may be augmented in wetter areas by the addition of legumes and sweet grasses.

The Grassland Biome is the cornerstone of the maize crop, and many grassland types have been converted to this crop. Sorghum, wheat and sunflowers are also farmed on a smaller scale.

Part of the site is also covered with a stand of Black Wattle trees, fringed with a small number of *Leucosidea* sp. trees (see Photograph 2)



Photograph 2: Black Wattle grove on Quarry Site.

C 1.5 What animals naturally occur in the area?			
Bush buck, vervet monkeys, baboons, birds, lizard, snakes, Rats and mice have been observed on site.			
	VALUE	TICK	OFFICE USE
C 1.6 Are there any protected areas (game parks/nature reserves, monuments, etc) close to the proposed operation?	Yes		
	No	X	
No protected areas occur on site or in close proximity to the site. No graves are to be found on the proposed site.			
C 1.7 What mineral are you going to prospect or mine for?	Dolerite for construction of roads, fill material for the Spring Grove Dam Wall and associated infrastructure.		
C 1.8 Describe the type of equipment that will be used:			

MINING METHOD

The mining method will entail the removal of top soil (which will be stockpiled) and then the removal of the overburden which will be stockpiled separately to the topsoil. Thereafter the dolerite will be extracted using a tracked excavator (depth 10-30 m).

MINERAL PROCESSING

The material will be passed through a small crusher and screening plant.

TRANSPORTATION

Transport within the mining area is by front end loader. The dolerite will be delivered to the dam site either using road transport or a conveyor belt system.

**C.2 HOW WILL THE PROPOSED OPERATION IMPACT ON THE *NATURAL* ENVIRONMENT?
REGULATION 52(2)(b))**

ENVIRONMENTAL ELEMENT/ IMPACT FOR	VALUE	TICK	OFFICE USE
C 2.1 What will the ultimate depth of the proposed prospecting/mining operations be?	0-5m		
	6-10m		
	10-25m		
	25m +	X	
C 2.2 How large will the total area of all excavations be?			3 ha
C 2.3 How large will each excavation be before it is filled up?	<10 X 10m		
	<20 X 20m		
	>20 X 20m	X	
C 2.4 How many prospecting boreholes or trenches will there be?	5 boreholes were drilled during the geotechnical investigation		
	VALUE	TICK	OFFICE USE
C 2.5 Will employees prepare food on the site and collect firewood?	No		

	No	X	
The employees will stay at the dam construction camp where the other employees for the construction of the Spring Grove dam will be housed. No fires will be allowed on site. Ablution facilities will be provided on-site			
C 2.6 Will water be extracted from a river, stream, dam and for use by the proposed operation?	Yes		
	No	X	
C 2,7 If so. what is the name of this water body?			
C 2.8 If water will not be extracted from an open surface source where will it be obtained?	Brought in by tankers from the Spring Grove Dam construction site.		
	VALUE	TICK	OFFICE USE
C 2.9 How much water per day will the mineral processing <u>operation</u> require?	1000 -10 000 Liters	X	
	20 000 - 40 000 L		
	40 000 - 60 000 L		
	60 000 -100		
	More		
C 2.10 How far is the proposed operation from open water	0 -15m		
	16-30m		
	31- 60m		
	More than 60 meters	X	
C 2.11 What is the estimated depth of the water table/			60 meters
C 2.12 How much water per day will the proposed operation utilize for <i>employees</i> ?			1000 Liters
C 2.13 What toilet facilities will be made available to workers?	None		
	Pit latrine long drop		
	Chemical toilet	X	
G 2.14 Would it be necessary to construct roads to access	Yes	X	
	No		

The existing road to the Springvale Farm will be upgraded to cater for the trucks. The route from the farm to the mine exists as a farm track and this will be upgraded to cater for the trucks.			
	VALUE	TICK	OFFICE USE
C 2.15 How long will these access road(s) be (from a public road to the proposed operations)	0 – 0.5 km		
	0.6 -1.5 km		
	1.6 - 3km	X	
The Springvale Farm road is off the R153 at Rosetta. The quarry is approximately 3 km from the turn off.			
C 2.16 Will trees be uprooted to construct these access road	Yes		
	No	X	
No trees will be uprooted to make way for the road as all the roads currently exist either as a good farm road or as a farm track.			
C 2.17 Will any foreign material, like crushed stone, limestone, or any material other than the naturally occurring topsoil be placed on the road surface?	Yes	X	
	No		
Material from the quarry will be used to surface the road.			
C.3 TIME FACTOR			
C 3.1 For what time period will prospecting /mining operations be conducted on this particular site?	0 - 6 months		
	6 -12 months		
	12 -18 months	X	
	18 - 24 months		
	>24 months		
C.4 HOW WILL THE PROPOSED OPERATION IMPACT ON THE SOCIO-ECONOMIC ENVIRONMENT REGULATION 52(2)(b)?			
	VALUE	TICK	OFFICE USE
ELEMENT/ IMPACTOR			
C 4.1 How many people will be employed?	10		
C 4,2 How many men?	10		
C 4.3 How many women?	0		
C 4.4 Where will employees be obtained? (Own or employed from local communities?)	Own	X	
The contractor supply their own skilled workforce to run the mine.			
C 4.5 How many hours per day will employees work?	Sunrise+ Sunset	X	

	VALUE	TICK	OFFICE USE
C 4.6 Will operations be conducted within 1 kilometer from a residential area?	Yes		
	No	X	
The town of Rosetta lies 1.5 km to the northwest.			
C 4.7 How far will the proposed operation be from the nearest fence/windmill/house/dam/built structure?	0 - 50 meters	X	
	51 -100 meters		
	150 or more meters		
There is a fence which bisects the proposed mine area. The nearest residential property is the Springvale Farm, approximately 1 km from the quarry.			
C 4.8 How do Interested and Affected Parties respond to the application for quarrying			
See Annexure 2 Public Participation Programme.			

C.5 HOW WILL THE PROPOSED OPERATION IMPACT ON THE CULTURAL HERITAGE OF THE SURROUNDING ENVIRONMENT? REGULATION <u>52(2)(b)</u>			
ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
C 5.1 Are there any graveyards or old houses or sites of historic significance within 1 kilometer of the area?	Yes		
	No	X	
C5.2 How have Interested and Affected Parties commented on cultural aspects?			
No specific concerns or comments have been made by interested and affected parties. See Annexure 2: Public Participation Programme			

C.6 SPECIFIC REGULATORY REQUIREMENTS

C.6.1 Air Quality Management and Control (Regulation 64)
--

Describe how the operation will impact on the quality of the air, taking into account predominant wind direction and affected parties in the downwind zone:	
The potential air quality pollution will mainly occur as a result of blasting and general mining activities. Certain precautionary measures will be taken to prevent dust (e.g. watering the roads to minimise dust generation)	
.	
1) There will be some creation of dust (mainly in the dry season) due to the use of vehicles on gravel roads. Current road use includes travel by the farmers, tenants and farm workers within the farm area.	
2) There will be a noticeable localized impact on air quality due to mining activities including drilling, blasting, crushing and haulage.	
C.6.3 Noise control (Regulation 66) Indicate how much noise the operation will generate, and how it will impact on the surrounding environment, who might be influenced b noise from our operation.	
Noise will be expected from blasting, quarrying and transportation of material off-site. Noise will be kept within the required/prescribed noise levels. When the noise levels exceed the prescribed noise level, the operator(s) will be sensitive to the needs of the surrounding communities, including notifying them in writing when they could be impacted by the noise and for how long.	
C.6.4 Blasting, vibration and shock (Regulation 6.7) Please indicate whether any blasting operations will be conducted.	
Blasting:	Yes / NO
How Often?	Not available
Overburden depths in places are quite significant. Overburden comprising topsoil, colluvium and weathered sandstone and siltstone can be as thick as 10 m. although this thins out and finally disappears to expose the dolerite. It is expected that the overburden will increase in a northwesternly direction with increasing elevation. Stripping of the topsoil and completely weathered sedimentary strata will require dozing, whilst the underlying to moderately weathered siltstone and sandstone will require blasting. Excavation of the usable dolerite rock will require blasting.	
A structural survey will be undertaken on properties within a 1km radius of the quarry. This will include an engineering survey confirmed with a photographic survey. This survey will record any existing damage to buildings. Should damage occur to buildings after blasting, a record, a survey will be conducted to confirm the damage. On closure, a final survey will be undertaken to confirm damage if any.	
A blasting programme will be developed at the start of mining which will track the blast pattern on a daily basis. This programme will made available to the public. Properties within 1 km of the quarry will be notified directly of the blasting programme on a weekly basis.	
C.6.5 Disposal of waste material (Regulation 69) <i>Indicate on your plan</i> where waste will be dumped in relation to the beneficiation works/ washing pans. Also indicate below how domestic waste material will be managed.	

Waste from the site will be collected on regular basis and used oils, grease and chemicals will be disposed of in an acceptable manner. Chemicals, grease and oils will be disposed of in a designated area for subsequent disposal at a licensed hazardous waste disposal site. Appropriate training and induction procedures will be implemented to ensure all staff and sub-contractors minimise waste. Maintenance and domestic refuse (scrap metal, packaging materials etc) will be collected in appropriate bins for recycling or sent to landfill for disposal. Refuse bins will be located on site. All wastes that can not be recycled will be sent to the closest registered landfill site.

C.6.6 Soil pollution and erosion control (Regulation 70)

6.6.1 Indicate how this will be handled on the area.

Topsoil will be stripped from the areas indicated below and will be stockpiled for use in reinstatement and rehabilitation of:

- Any area to be used for the development of the mine.
- Any area to be excavated for construction purposes.
- Any area which is to be used for temporary storage of materials including topsoil stockpiles.
- Areas which could be polluted by any aspect of the mining activity.
- Areas designated for the dumping of spoil.
- Any area which is to be used for the storage of mine products.

Topsoil will be temporarily stockpiled, separately from subsoil and rocky material. The Operator will ensure that sub-soil and topsoil are not mixed during reinstatement and rehabilitation. The usefulness of topsoil for rehabilitation of the site will be lost should it be mixed with the subsoil.

Stripping of topsoil will be undertaken in such a way as to minimize erosion by wind or runoff.

Areas from which topsoil is to be removed will be cleared of any foreign material which may come to form part of the topsoil during removal including bricks, rubble, any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil.

Topsoil will be stockpiled in the areas identified on the Mine Layout Plan (Annexure 1). Soil should be exposed for the minimum time possible once cleared of invasive vegetation. The timing of clearing and grubbing will be coordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. Where required the stockpiles will either be vegetated with indigenous grasses or covered by a suitable fabric to prevent erosion and invasion by weeds. Stockpiled topsoil will not be compacted. No vehicles are allowed access onto the stockpiles after they have been placed.

6.6.2 Describe how spills of oil, grease, diesel, acid or hydraulic fluid will be dealt with.

To avoid the incidence of oil, grease or hydraulic fluid spills (no requirement for acid on site), strict control measures will be applied to all contractors prior to commencing mining on site. In this regard, drip pans or large plastic sheets are mandatory for use at all sites to prevent pollution of topsoil by spillage of lubricating fluids or fuel. All staff (contractors) should be trained with regards to the handling of oil, fuel etc.

Spillage control will be provided by bunding or collecting spills to a sump for disposal or controlled by absorbent materials. Spill containment facilities such as impermeable bunds, compacted pads or drip trays will be provided in oil and chemical storage sites and vehicle maintenance areas. Re-fueling and handling of chemicals will occur only in a designated area. Appropriate corrective actions will be undertaken if an incident occurs: the spill will immediately be cleaned up or appropriately disposed of; and all spills and actions will be reported in the on site Environmental Incident Register. Material from bunded areas will not be buried during rehabilitation

In the unlikely event that any pollution due to the above takes place, the following procedure applies:

- Any polluted material or ground must be dug out to a depth of 50cm below penetration of the pollution or spillage and removed at the drillers cost to a recognized hazardous waste disposal site registered to accommodate this type of waste. This refers to chemical and/or oil spillage.
- The area will be rehabilitated, with the void being filled in with subsoil and subsequently topsoil placed and allowed to re-vegetate. If insufficient material is available, then arrangements will be made to import material to the area to fill the void and level out the area, to minimize the impact.
- Separate sumps are to be excavated and constructed with liners for wastewater, grease and oil contaminated fluid. This fluid will be treated and removed from site in drums for disposal through designated waste methods. No discard of waste on site will be allowed (see also section 6.5).

6.6.3 Briefly describe the storage facilities available for the above fluids:

All chemical drums will be transported to a designated and bunded area when empty, when the contents of the drum are unusable or unknown. All drums will be appropriately disposed of.

Throughout the mining period, potentially hazardous chemicals will be stored on the site and uncontrolled release of these chemicals into the environment must be avoided. Hazardous materials include diesel, petroleum, oil, bituminous products, cement, solvent-based paints, drilling fluids and LPG. Spills must be controlled with the following actions

- All staff and contractors will undergo relevant training in the maintenance of equipment to prevent the accidental discharge or spill of hazardous substances.
- Chemicals will be stored in labelled, closed containers within designated areas, with sealed floors (preferably sheltered).
- Best Practice Procedures will be used for potential hydrocarbon and chemical spill incidents

<p>C.6.7 If significant impacts on any element of the environment mentioned in Section C 1 to C 6.6 above have been identified, summarize all of them here: (Regulation 52(2)(c))</p> <p>PLEASE NOTE NUMBERING REFERS TO SECTION B3, DETAILS OF THE PROPOSED QUARRYING OPERATION AND TAKES COGNISANCE OF ANY ISSUES IDENTIFIED IN C4.8 AND C5.2</p>	<p>C.fi.8 How will the negative impacts on the environment be mitigated or managed (as described in C 6.11 to the left? (Regulation 57(2)(c))</p>
<p>1 Physical impact of the environment due to upgrading of the access road to site</p> <p>The access road to the mine will be widened from the Springvale Farm to the quarry using the bulldozer. No material will initially be placed on the road as the initial stage is the establishment of the mine.</p>	<p>A number of Black Wattle trees will be removed for the quarry. No other trees are expected to be removed. The existing roads will be upgraded to cater for the trucks and other mine vehicles. Since the road exists, it is unlikely the land owner will require these roads to be removed after quarrying has been completed.</p> <p>On completion of the project all roads widened will be returned to their original sizes as per the EMP requirements.</p>
<p>3. Dust Generation</p> <p>The top soil will be removed first and stockpiled to the west of the pit in three areas in the shape of a horseshoe. The stockpile will have the height of 8 metres.</p> <p>Drill hole / blasting / mining / haulage dust generation Overburden will be blasted and removed and stockpiled between the topsoil stockpile and the pit. It will be placed within the topsoil horseshoe. Some of the overburden may be used to upgrade the road to the mine from the R103.</p>	<p>Dust is expected during the removal of the topsoil and from the stockpile during windy conditions. To prevent this, the handling of soil will be avoided during windy conditions and the stockpile will be temporarily vegetated or covered with a liner.</p> <p>Dust is expected from the drilling / blasting / mining and haulage. Precautionary measures will be implemented e.g. the watering down to prevent dust around the area, setting a specific speed limit for trucks transporting material.</p> <p>A barrier of Black Wattle trees will be left on the south eastern, southern south western sides of the quarry to trap dust in the summer months when the predominant wind direction is north westerly. In Winter the predominant wind direction is south easterly and so the tree barrier should have the effect of reducing wind velocity thereby reducing the generation of dust behind the tree barrier. Additional dust suppression measures will be required from time to time (as described above).</p>

<p>Noise</p> <p>Drill hole / blasting / mining / haulage noise generation Topsoil will be removed and stockpiled. Overburden will be blasted and removed and stockpiled between the topsoil stockpile and the pit.</p>	<p>For general noise control, silencers on the trucks or cars will be proper working condition.</p> <p>For blasting, the surrounding communities will be informed 24 hrs before the blast</p>
<p>4. Environmental issues due to personnel on site (litter, firewood collection, etc...)</p> <p>The mining site will be established by bringing in three shipping containers: one for the office, one for ablutions and one for stores. Tanks for water and fuel will be erected and chemical toilets will be established.</p>	<p>The mining site will have a visual impact on the area and the surrounding area, but this will be a short term impact as all of the containers will be removed on completion of mining.</p> <p>Potential contamination could occur on site as the contractors will be storing and using fuel which could result in the pollution if necessary precautions as prescribed in the EMP are not implemented.</p> <p>Fuel, lubricants, transmission and hydraulic fluid shall only be stored in designated areas. All fuel tanks must in future be installed above ground level, depending on the volume of stored fuel, for easy detection of fuel leaks. The integrity of existing sub surface fuel tanks shall be tested by an approved authority according to the specifications of the fuel supplier.</p> <p>A fuel tank bunding must be lined with a impermeable layer and maintained throughout the life of the mine so as to prevent soil pollution</p> <p>The operator must provide adequate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons. Such facilities must be designed and sited with the intention of preventing pollution of the surrounding environment.</p> <p>Waste management will be controlled by the use of skips for general waste. These skips are to be covered. Disposal of the contents of the skips must be done at a permitted landfill.</p> <p>Potentially hazardous raw and waste materials shall be handled and stored onsite in</p>

<p>The Black Wattle trees within the mine pit area will be removed. The wood from trees will be made available to the local communities for use as firewood.</p>	<p>containers with tight lids that must be sealed and must be disposed of at an approved and permitted to hazardous waste disposal site. These containers shall be properly and permanently marked as containing 'Hazardous Waste' and shall not be used for any other purpose.</p> <p>The following waste products were identified as being hazardous of nature and shall only be disposed of on a hazardous waste disposal site as classified by DWAF.</p> <ul style="list-style-type: none"> • Diesel, petroleum, all types of oil and lubricants and soil or rags contaminated by the products. • Pesticides and pesticide containers. • Paints and turpentine. • Any other product / material declared as a Group I, II, III & IV hazardous substance as per Hazardous Substances Act, 1973 (Act 15 of 1973), Section 3, as amended. <p>There is a long term positive impact as these trees will not be replanted on completion of the project. The rehabilitation programme will result in the area being re-vegetated with indigenous plants.</p>
<p>5. Access roads rehabilitation</p>	<p>Once the quarry operations are finished, rehabilitation of the areas affected during the mining operation will take place. The contractor will ensure that the rehabilitation process is successful before leaving the site and will continuously assess the site for a period of six months or more after closure to ensure the successful closure of the mining operation.</p>
<p>6. Storm Water Management</p>	<p>A small berm (1m) high will be constructed around the entire mine area for storm-water control. Water falling in the pit and the on the stockpiles will be collected and used for dust suppression. A storm-water tank is provided for to store this water. General shaping during quarry establishment will divert clean water away from the quarry, thereby separating clean and dirty water circuits.</p>

7. Traffic Impacts

Dolerite from the quarry will be transported by road to the Spring Grove Dam construction site.

Trucks are loaded directly in the pit and these travel down the main mine road to the R103. From there the trucks turn right onto the R103. Approximately 500m down, the trucks will turn left into the D146. This road will need to be upgraded to cater for these trucks. This road leads to the dam construction site.

C.7 Financial provision; (Regulation 54)

The amount that is necessary for the rehabilitation of damage caused by the operation, both sudden closure during the normal operation of the project and at final, planned closure will be estimated by the regional office of the DME, based on the information supplied in this document. This amount will reflect how much will it cost the Department to rehabilitate the area disturbed in case of liquidation or abscondence.

Enter the amount of financial provision required here:
R694,800

CALCULATION OF THE QUANTUM							
Mine: Springvale Dam Evaluators:				Location: Rosetta, KZN Date: June 2007			
Risk Class		C					
Area Sensitivity		Med					
No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master rate	Multiplication factor	Weighting factor 1	Amount (rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	40	6.82	1.00	1.00	273
3	Rehabilitation of access roads	m2	4,500	17.00	1.00	1.00	76,500
5	Demolition of housing and/or administration facilities	m2	120	190.00	1.00	1.00	22,800
6	Opencast rehabilitation including final voids and ramps	ha	4	96,700.00	0.52	1.00	175,994
10	General surface rehabilitation	ha	4	52,600.00	1.00	1.00	184,100
12	Fencing	m	1,200	60.00	1.00	1.00	72,000
13	Water management	ha	4	20,000.00	0.25	1.00	17,500
14	2 to 3 years of maintenance and aftercare	ha	7	700.00	1.00	1.00	4,900
SubTotal 1							554,067
(Sum of items 1 to 15 above)							
1	Preliminary and General	6.0% if Subtotal 1 > 100 000 000			Weighting factor 2		
		12.0% if Subtotal 1 < 100 000 000					0
7	Contingency	10.0% of Subtotal 1					55,407
SubTotal 2							609,473
(Subtotal 1 plus sum of management and contingency)							
Add Vat (14%)							85,326
GRAND TOTAL							694,800
(Subtotal 2 plus VAT)							

What method will be used to furnish DME with this financial provision?

Cash deposit	
Bank guarantee	
Trust Fund	
Other: (specify) Note: other methods must be approved b the Minister DWAF will provide for rehabilitation in the construction cost of Spring Grove Dam	✓

The standard formats for each of these types of guarantees are available from your regional office of the DME.

C.8.1 Monitoring and performance assessment.

Regulation 55 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) clearly describes the process and procedure as well as requirements for monitoring and auditing of the performance of this plan to adequately address environmental impacts from the operation. The following information must be provided:

<p>C.8.2 Please describe how the adequacy of this programme will be assessed and how any inadequacies will be addressed. (Regulations-55(1 and 522)(e))</p>
<p>Example: I will, on a <i>bi-monthly</i> basis, check every aspect of my <i>operation against the prescriptions given in Section F ~ this document and, if I find that certain aspects are not addressed or impacts on the environment are not mitigated properly, will rectify the identified inadequacies immediately.</i></p>
<p>DWAF will appoint an independent Environmental Control Officer (ECO) who will undertake site inspections and train the contractor and his/her staff on Environmental Management Issues and related issue. The ECO will ensure compliance with the requirements set in this EMP and brief the contractor about the content of the EMP. The contractor will be responsible for Environmental Control on site during the construction and the maintenance period</p> <p>The ECO will also undertake the monthly audits to assess the performance of the contractor and staff with regard to the EMP. The ECO will respond to any complaints form the public and report any incidents to the relevant authority.</p>

<p>C.9 Closure and Environmental objectives: (Regulation 52(2Kf)) Clearly state the intended end use for the area prospectedmined after closing of operations</p>
<p>The closure programme of any mine or quarry is dependent on the end land use (See Figure 4). In the case of Springvale Mine, three options exist:</p> <ol style="list-style-type: none"> 1. The current landowner continues mining once the dam has been built. Negotiations between the land owner and DWAF would be required in terms of liability. 2. The mine is left as an open pit and is used as a water storage facility for Springvale Farm 3. The mine is rehabilitated to its current land use, grazing land. <p>For the purpose of this EMP, the third option is considered.</p> <p>The following closure plan is proposed:</p> <ul style="list-style-type: none"> • The high-walls are blasted down to remove the vertical faces; • A section of the south eastern wall is blasted open to form a chasm to release stormwater; • The overburdened is replaced in the pit by truck and bulldozer; • The topsoil is replaced on top of the overburden and shaped to a 15 degree slope (see Figure 5); • The area is reseeded with appropriate grasses; • The area is monitored and maintained until full rehabilitation has been achieved and the site can be ‘walked away from’.

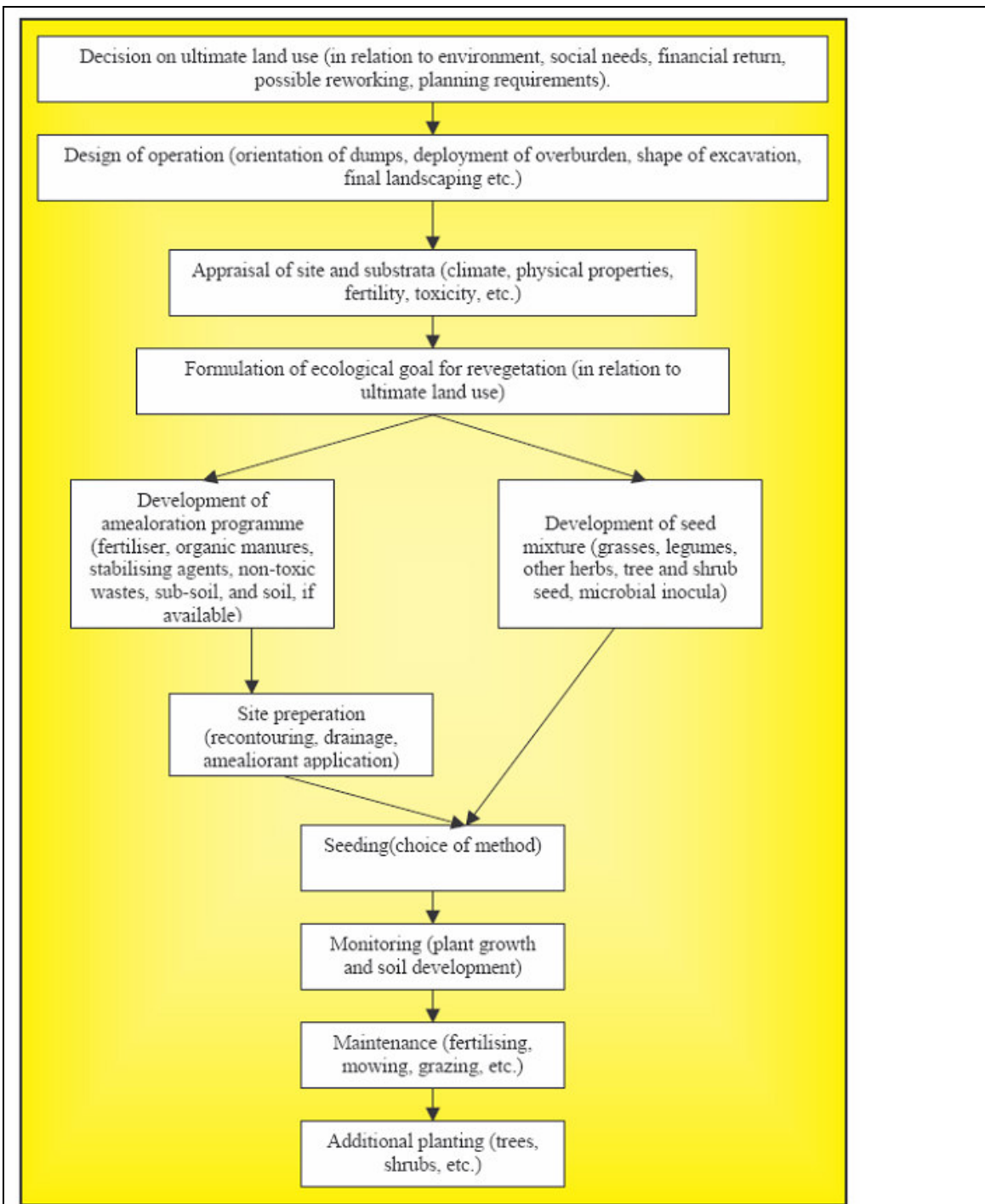


Figure 4: Rehabilitation programme model (after Bradshaw and Chadick, 1980)

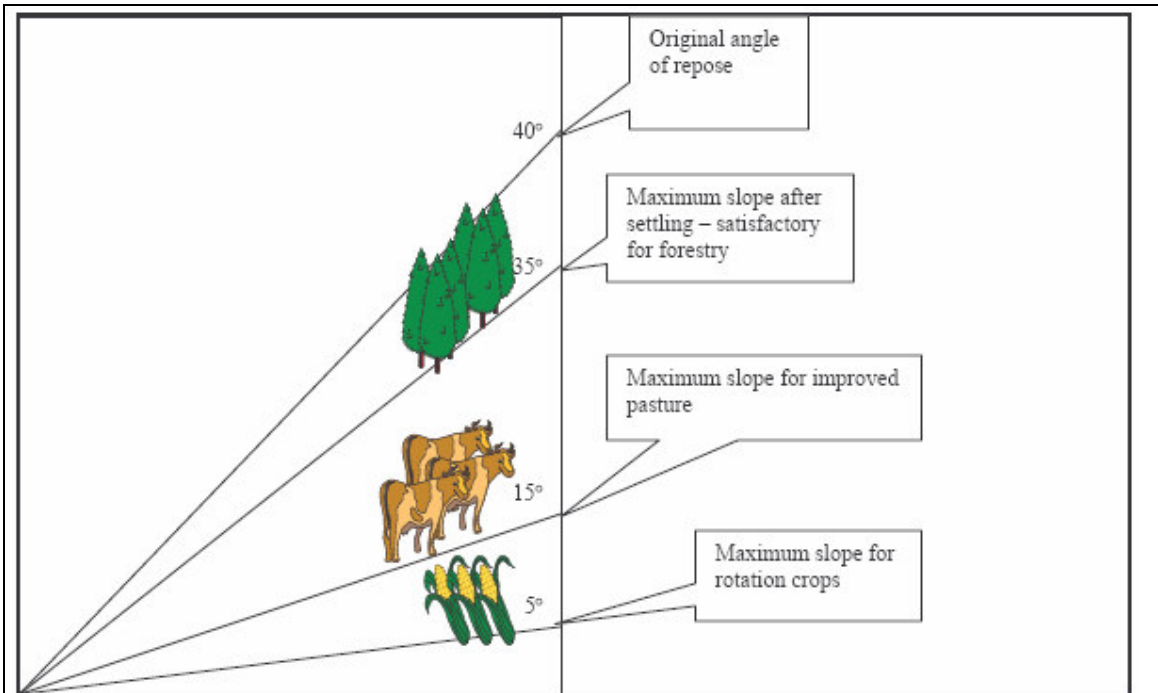


Figure 5: Desired slope (after Bradshaw 2000).

C.9.1 Describe, in brief terms, what the environment will look like after a closure certificate has been obtained.

There will be a permanent impact on the topography of the area. The final quarry form will be a sloping depression to a depth of approximately 25m. The south eastern section will be opened for form a chasm where storm-water can discharge to the river. Figure 6 (Annexure 1) shows the final contouring. Photograph 4 indicates the current view from Spring Vale Farm and Photograph 5 the final view from Spring Vale farm.



Photograph 4: Current topography from Spring Vale Farm



Photograph 5: Final topography from Spring Vale Farm

Note: The proposed end-state of your area must be consulted with interested and affected parties in terms of Regulation 52(2)(g). Details of the acceptability of the end-state must appear in the section below.

C 10 CLOSURE

Regulations 56 to 62 outline the entire process of mine closure, and these are copied in Section F of this document, both as a guide to applicants on the process to be followed for mine closure, and also to address the legal responsibility of the applicant with regard to the proper closure of his operation. In terms of Section 37 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), the holder of a permit is liable for any and all environmental damage or degradation emanating from his/her operation, until a closure certificate is issued in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

C.11 Public Participation: (Regulation 52(2)(g))

In terms of the above regulation consultation with interested and affected person or persons must take place prior to the approval of the environmental management plan. This regulation is quoted below for ease of reference.

"a record of the public participation undertaken and the results thereof"

- C 11.1 Any comments lodged by an interested and affected person or persons in terms of section 10(1)(b) of the Act, must be in writing and addressed to the relevant Regional Manager.
- C 11.2 Any objections lodged by an interested and 'affected person or persons against the application for a right or permit in terms of the Act, must set out clearly and concisely the facts upon which it is based and must be addressed to the relevant Regional Manager in writing.
- C 11.3 The Regional Manager must make known by way of publication in a local newspaper or at the office of the Regional Manager, that an application for a right or permit in terms of the Act has been received.

In the table below, please list the names of people or organizations likely to be influenced by the proposed operations (these might include neighbors, other water users, etc.) Kindly indicate how these people were consulted (e.g. By letter or by phone) *and provide proof* of that consultation. What were the main concerns/ objections raised by the interested and affected parties to the proposed operation?

Name of Interested/ affected party	Contact details: Address & telephone number	How did consultation take place?	What were his/her main concern about the operation?
See Annexure 2 for details of the public participation programme			

D SCORING OF EIA- FOR OFFICIAL USE ONLY

Instructions for officials:

In this table, complete the totals of each section indicated below and do the calculation. Remember to first add all the values of sections C 1, 2, 4 and 5 and then to multiply it by the time factor in Section C 3

Note that the value for the time factor element of the impact rating appears in Section C3. This is the total amount of time that the operation is expected to impact on the environment and all other factors are MULTIPLIED by this value. Compare the score (Impact rating) with the table below to help you make a decision on the total impact of the operation and also on the sufficiency of this programme to address all expected impacts from the operation on the environment.

D 1.1 CALCULATION TABLE

Section C 1 Total	+	Section C 2 Total	+	Section C 4 Total	+	Section C 5 Total		Subtotal	X	Time Factor Section C 3	=	Score (Impact rating)
	+		+		+				X			

D 1.2 IMPACT RATING SCALE

SCORE ATTAINED	IMPACT RATING	REMARKS
46-300	Low	No additional <u>objectives</u> needed - <u>this programme</u> is sufficient
301-800	Medium	Some specific additional objectives to address focal areas of concern may be set.
801-1160	High	Major revision of Environmental Management Plan for adequacy and full revision of objectives,

Additional Objectives;

Based on the information provided by the applicant and the regional office's assessment thereof, combined with the interpretation of the scoring and impact rating attained for the particular operation above, the Regional Manager of the regional office of the DME may now determine additional objectives /requirements for the mine owner/manager to comply with. *These measures will be specific and will address specific issues of concern that are not adequately covered in the standard version of this document* These requirements are not listed here, but are specified under Section G of this document, so as to form part of the legally binding part of this Environmental Management Plan.

E. UNDERTAKING:

I,, the applicant for a **MINING..** permit / ~~right~~ hereby declare that the above information is true, complete and correct. I undertake to implement the measures as described in Sections F and G hereof. I understand that this undertaking is legally binding and that failure to give effect hereto will render me liable for prosecution in terms of Section 98 (b) and 99 (1)(g) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). I am also aware that the Regional Manager may, at any time but after consultation with me, make such changes to this plan as he/she may deem necessary,

Signed on this day of 200..... at(Place)

Signature of applicant

F. ENVIRONMENTAL MANAGEMENT PLAN:

INTRODUCTION

This Environmental Management Plan contains guidelines, operating procedures and rehabilitation/pollution control requirements which will be binding on the holder of the mining permit/prospecting permission/ reconnaissance permission after approval of the Environmental Management Plan. It is essential that this portion be carefully studied, understood, implemented and adhered to at all times.

F 1 GENERAL REQUIREMENTS

F 1.1 MAPPING AND SETTING OUT

F 1.1.1 LAYOUT PLAN

- A copy of the layout plan as provided for in Regulation 2,2 must be available at the prospecting/mining site for scrutiny when required.
- The plan must be updated on a regular basis with regard to the actual progress of the establishment of surface infrastructure, mining operations and rehabilitation (a copy of the updated plan shall be forwarded to the Regional Manager on a regular basis).

A final layout plan must be submitted at closure of the mine or when operations have ceased.

NOTE: Regulation 2.2 of the regulations promulgated in terms of the Act requires:

'An application contemplated in sub-regulation (1) must be accompanied by a plan that must contain - (a) the co-ordinates of the land or area applied for,

(b) the north point;

(c) the scale to which the plan has been drawn;

(d) the name, number and location of the land or area covered by the application; and

(e) in relation to farm boundaries and surveyed points

(i) the size and shape of the proposed area;

(ii) the boundaries of the land or area comprising the subject of the application concerned,

(iii) the layout of the proposed reconnaissance, prospecting, exploration, mining or production operations;

(iv) surface structures and servitudes;

(v) the topography of the land or area; '

F 1.1.2 DEMARCATING THE MINING/ PROSPECTING AREA

- The mining/ prospecting area must 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 as indicated on the layout plan or as prescribed by the Regional Manager must be firmly erected and maintained in their correct position throughout the life of the operation.
- Mining/ prospecting and resultant operations shall only take place within this demarcated area.

F 1.1.3 DEMARCATING THE RIVER CHANNEL AND RIVERINE ENVIRONMENT

The following is applicable if operations are conducted within the riverine environment (See F 3.2):

- Beacons as indicated on the layout plan or as prescribed by the Regional Manager must be erected and maintained in their correct position throughout the life of the operation.
- These beacons must be of a permanent nature during the operations and must not be easily removable, especially those in a river channel. The beacons must, however, be removed at the end of the operations.
- The mining of and prospecting for any mineral shall only take place within this demarcated mining area.
- If riverine vegetation is present in the form of reeds or wetland vegetation, the presence of these areas must be entered in Part C 1.45 of the EMPlan and indicated on the layout plan,
- The holder of the mining permit/ prospecting right will also be required to permanently demarcate the areas as specified in F 1.1.2,

F 1.2 RESTRICTIONS ON MINING/ PROSPECTING

- On assessment of the application, the Regional Manager may prohibit the conducting of mining or prospecting operations in vegetated areas or over portions of these areas

C.9.1 Describe, in brief terms, what the environment will look like after a closure certificate has been obtained.

F 1.3 RESPONSIBILITY

- The environment affected by the mining/ prospecting operations shall be rehabilitated by the holder, as far as is practicable, to its natural state or to a predetermined and agreed to standard or land use which conforms with the concept of sustainable development. The affected environment shall be maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof.
- It is the responsibility of the holder of the mining permit/ prospecting right to ensure that the manager on the site and the employees are capable of complying with all the statutory requirements which must be met in order to mine, which includes the implementation of this EMP.
- If operations are to be conducted in an area that has already been disturbed, the holder must reach specific agreement with the Regional Manager concerning the responsibilities imposed upon him/her pertaining to the rehabilitation of the area and the pollution control measures to be implemented.

F 2 INFRASTRUCTURAL REQUIREMENTS

F 2.1 TOPSOIL

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur,
- All available topsoil shall be removed after consultation with the Regional Manager prior to the commencement of any operations.
- The topsoil removed, shall be stored in a bund wall on the high ground side of the mining/prospecting area outside the 1:50 flood level within the boundaries of the mining area/prospecting.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of access roads.
- The topsoil stored in the bund wall shall be adequately protected from being blown away or being eroded.

F 2.2 ACCESS TO THE SITE

F 2.2.1 Establishing access roads on the site

- The access road to the mining/prospecting area and the camp-site/site office must be established in consultation with the landowner/tenant and existing roads shall be used as far as practicable.
- Should a portion of the access road be newly constructed the following must be adhered to:
 - The route shall be selected that a minimum number of bushes or trees are felled and existing fence lines shall be followed as far as possible.
 - Water courses and steep gradients shall be avoided as far as is practicable.
 - Adequate drainage and erosion protection in the form of cut-off berms or trenches shall be provided where necessary.
- If imported material is used in the construction or upgrading of the access road this must be listed in C 2.17
- The erection of gates in fence lines and the open or closed status of gates in new and existing positions shall be clarified in consultation with the landowner/tenant and maintained throughout the operational period.
- No other routes will be used by vehicles or personnel for the purpose of gaining access to the site.

NOTE: The design, construction and location of access to provincial roads must be in accordance with the requirements laid down by the Provincial or controlling authority.

F 2.2.2 Maintenance of access roads

- In the case of dual or multiple use of access roads by other users, arrangements for multiple responsibility must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the mining permit/ prospecting right.
- Newly constructed access roads shall be adequately maintained so as to minimize dust, erosion or undue surface damage.

F 2.2.3 Dust control on the access and haul roads

- The liberation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.

F 2.2.4 Rehabilitation of access roads

- Whenever a mining permit/ prospecting right is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the permit or right, any access road or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the Regional Manager.
- Any gate or fence erected by the holder which is not required by the landowner/tenant, shall be removed and the situation restored to the pre mining/ prospecting situation.
- Roads shall be ripped or ploughed, and if necessary, appropriately fertilized (based on a soil analysis) to ensure the re-growth of vegetation. Imported road construction materials which may hamper re-growth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.
- 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/prospecting operation, be corrected and the area be seeded with a seed mix to the Regional Manager's specification.

F 2.3 OFFICE/CAMP SITES

F 2.3.1 Establishing office I camp sites

- Office and camp sites shall be established, as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/ prospecting area.
- The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation. Topsoil shall be handled as described in F 2.1 above.
- No camp or office site shall be located closer than 100 meters from a stream, river, spring, dam or pan.
- No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner/tenant.
- Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break shall be cleared around the perimeter of the camp and office sites.

- Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant persons lawfully living in the vicinity shall be kept to a minimum.

F 2.3.2 Toilet facilities, waste water and refuse disposal

- As a minimum requirement, the holder of a mining permit/ prospecting right shall, at least, provide pit latrines for employees and proper hygiene measures shall be established.
- Chemical toilet facilities or other approved toilet facilities such as a septic drain shall preferably be used and sited on the camp site in such a way that they do not cause water or other pollution.
- The use of existing facilities must take place in consultation with the landowner/tenant,
- In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to.
- All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 meters, from any stream, river, pan, dam or borehole.
- Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility.
- Spills should 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 recognized facility.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognized disposal facility. Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the camp site.
- Biodegradable refuse generated from the office/camp site, processing areas vehicle yard, storage area or any other area shall either be handled as indicated above or be buried in a pit excavated for that purpose and covered with layers of soil, incorporating a final 0,5 meter thick layer of topsoil (where practicable). Provision should be made for future subsidence of the covering.

F 2.3.3 Rehabilitation of the office/camp site

On completion of operations, all buildings, structures or objects on the camp/office site shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), which states:

- (1) When a prospecting right, mining right, retention permit or mining permit lapses, is cancelled or is abandoned or when any prospecting or mining operation comes to an end, the holder of any such right or permit may demolish or remove any building, structure, object -
 - (a) *which* may not be demolished in terms of any other law;
 - (b) which has been identified in writing by the Minister for purposes of this section; or
 - (c) which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.
- (2) The provision of subsection (1) does not apply to bona fide mining *equipment which may be removed*
 - Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped. Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.
 - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous 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/prospecting operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.
 - Photographs of the camp and office sites, before and during the mining/ prospecting operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

F 2.4 VEHICLE MAINTENANCE YARD AND SECURED STORAGE AREAS

F 2.4.1 Establishing the vehicle maintenance yard and secured storage areas

- The vehicle maintenance yard and secured storage area will be established as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/prospecting area.
- The area chosen for these purposes shall be the minimum reasonably required and involve the least disturbance to tree and plant life. Topsoil shall be handled as described in F 2.1 above.
- The storage area shall be securely fenced and all hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored therein. Drip pans, a thin concrete slab or a facility with PVC lining, shall be installed in such storage areas with a view to prevent soil and water pollution.
- The location of both the vehicle maintenance yard and the storage areas are to be indicated on the layout plan.
- No vehicle may be extensively repaired in any place other than in the maintenance yard,

F 2.4.2 Maintenance of vehicles and equipment

The maintenance of vehicles and equipment used for any purpose during the mining/prospecting operation will take place only in the maintenance yard area.

- Equipment used in the mining/prospecting process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
Machinery or equipment used on the mining/prospecting area must not constitute a pollution hazard in respect of the above substances. The Regional Manager shall order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.

F 2.4.3 Waste disposal

- Suitable covered receptacles shall be, available at all times and conveniently placed for the disposal of waste.
- All used oils, grease or hydraulic fluids shall be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.
- All spills should 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 recognized facility.

F 2.4.4 Rehabilitation of vehicle maintenance yard and secured storage areas

- On completion of mining/prospecting operations, the above areas shall be cleared of any contaminated soil, which must be dumped as referred to in section F 2.4.3 above.
- All buildings, structures or objects on the vehicle maintenance yard and secured storage areas shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002.
- The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilized if necessary (based on a soil analysis).
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous 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/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

F 3 OPERATING PROCEDURES IN THE MINING AREA

F 3.1 Limitations on mining/prospecting

- The mining of or prospecting for precious stones shall take place only within the approved demarcated mining or prospecting area.
- Mining/ prospecting may be limited to the areas indicated by the Regional Manager on assessment of the application.
- The holder of the mining permit/ prospecting right shall ensure that operations take place only in the demarcated areas as described in section F 1.1.2 above. Operations will not be conducted closer than one and a half times the height of the bank from the edge of the river channel and in such manner that the stability of the bank of the river is effected.
- Precautions shall also be taken to ensure that the bank of the river is adequately protected from scouring or erosion. Damage to the bank of the river caused by the operations, shall be rehabilitated to a condition acceptable to the Regional Manager at the expense of the holder.
- Restrictions on the disturbance of riverine vegetation in the form of reeds or wetland vegetation must be adhered to. The presence of these areas must be entered in Part of the programme and indicated on the layout plan.

F 3.2 Mining/ prospecting operations within the riverine environment

NOTE: The Department of Water Affairs and Forestry may impose additional conditions which must be attached to this EMP. In this regard, please see the Best Practice Guideline for small scale mining developed by DWAF (BPG 2.1)

- The mining of or prospecting for precious stones in the river or the banks of the river will be undertaken only after the Regional Manager has consulted with the Department of Water Affairs and Forestry.
- The canalization of a river will not be undertaken unless the necessary permission has been obtained from the Department of Water Affairs and Forestry. Over and above the conditions imposed by the said Department, which conditions shall form part of this EMPlan, the following will also apply:
 - The canalization of the flow of the river over different parts of the river bed shall be constructed in such a manner that the following are adhered to at all times:
 - The flow of the river may not be impeded in any way and damming upstream may not occur.
 - The canalization of the flow may not result in scouring or erosion of the river-bank.
 - Well points or extraction pumps in use by other riparian users may not be interfered with and canalization may not impede the extraction of water at these points.
- Access to the riverbed for the purpose of conducting excavations in the river-bed, shall be through the use of only one access at a time. The location of the access to the river channel across the river-bank shall be at a point of the river-bank where the least excavation and damage to vegetation will occur and shall not be wider than is reasonably required. The position of the river access together with all planned future access points, must be indicated on the layout plan.

F 3.2.1 Rehabilitation of access to river-bed

- When rehabilitating the access point, the original-profile of the river-bank will be reestablished by backfilling the access point with the original material excavated or other suitable material. • The topsoil shall then be returned over the whole area to its original depth and if necessary fertilized and the vegetation allowed to grow.
- 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/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.
- In the event of damage from an occurrence where high flood waters scour and erode access points in the process of rehabilitation over the river-bank or an access point currently in use, repair of such damage shall be the sole responsibility of the holder of the mining permit or prospecting right.
- Repair to the river-bank to reinstate its original profile to the satisfaction of the Regional Manager must take place immediately after such event has occurred and the river has subsided to a point where repairs can be undertaken.
- Final acceptance of rehabilitated river access points will be awarded only after the vegetation has re-established to a point where the Regional Manager is satisfied that the river-bank is stable and that the measures installed are of durable nature and able to withstand high river flow conditions.

F 3.2.2 Rehabilitation of mining/prospecting area in the bed of the river

- The goal of rehabilitation with respect to the area where mining/prospecting has taken place in the river-bed is to leave the area level and even, and in a natural state containing no foreign debris or other materials and to ensure the hydrological integrity of the river by not attenuating or diverting any of the natural flow.
- All scrap and other foreign materials will be removed from the bed of the river and disposed of as in the case of other refuse (see section F 2.3.2 above), whether these accrue directly from the mining/prospecting operation or are washed on to the site from upstream.
- Removal of these materials shall be done on a continuous basis and not only at the start of rehabilitation,
- Where reeds or other riverine vegetation have been removed from areas, these shall be re-established systematically in the approximate areas where they occurred before mining/prospecting.
- An effective control programme for the eradication of invader species and other exotic plants, shall be instituted on a regular basis over the entire mining/prospecting area under the control of the holder of the mining permit/ prospecting right, both during mining/prospecting and at the stage of final rehabilitation.

2. THE WATER USE LICENSE

The National Water Act, (Act 36 of 1998), is based on the principles of sustainability, efficiency and equity, meaning that the protection of water resources must be balanced with their development and use.

In addition to being issued with a prospecting right or mining permit a small-scale miner may also need to get a water use license for the proposed water uses that will take place, except in certain cases.

NOTE: The Department of Water Affairs and Forestry (DWAF) developed specific Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management. Copies of these guidelines can be obtained from the regional office of DME or DWAF. Applications for a water use license must be made in good time, such that approval can be granted before a water use activity can begin. The appropriate license forms for each kind of expected water use should be completed together with supporting documentation. The main supporting document required is a technical report. To make the technical report easier, you can refer to sections in this EMPlan, as most of what the technical report requires has already been done in the EMPlan. If you refer to the EMPlan it must be attached to the technical report.

F 3.3 EXCAVATIONS

F 3.3.1 Establishing the excavation areas

- Whenever any excavation is undertaken for the purpose of locating and/or extracting ore bodies of all types of minerals, including precious stone bearing gravels, the following operating procedures shall be adhered to:
 - Topsoil shall, in all cases (except when excavations are made in the river-bed), be handled as described in F 2.1 above.
 - Excavations shall take place only within the approved demarcated mining/prospecting area.
 - Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once the ore or gravel has been excavated.
 - Trenches shall be backfilled immediately if no ore or precious stone-bearing gravel can be located.

F 3.3.2 Rehabilitation of excavation areas

The following operating procedures shall be adhered to:

- The excavated area must serve as a final depositing area for the placement of tailings during processing.
- Rocks and coarse material removed from the excavation must be dumped into the excavation simultaneously with the tailings.
- Waste, as described in paragraph F 2.3.2 above, will not 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. 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/ prospecting operation, be corrected and the area be seeded with a vegetation seed mix to his or her specification.

F 3.4 PROCESSING AREAS AND WASTE PILES (DUMPS)

F 3.4.1 Establishing processing areas and waste piles

- Processing areas and waste piles shall not be established within 100 meters of the edge of any river channel or other water bodies.
- Processing areas should be established, as far as practicable, near the edge of excavations to allow the waste, gravel and coarse material to be processed therein.
- The areas chosen for this purpose shall be the minimum reasonably required and involve the least disturbance to vegetation.
- Prior to development of these areas, the topsoil shall be removed and stored as described in paragraph F 2.1 above.
- The location and dimensions of the areas are to be indicated on the layout plan and once established, the processing of ore containing precious stones shall be confined to these areas and no stockpiling or processing will be permitted on areas not correctly prepared,
- Tailings from the extraction process must be so treated and/or deposited that it will in no way prevent or delay the rehabilitation process.

F 3.4.2 Rehabilitation of processing areas

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- On completion of mining/prospecting operations, the surface of the processing areas especially 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 material that was removed from the processing area will be replaced in the same order as it originally occurred.
- The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- 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/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

F 3.5 TAILINGS DAM(S) (SLIMES DAM)

The permission of the Regional Manager must be obtained should a tailings dam be constructed for the purpose of handling the tailings of the mining/prospecting operations. The construction, care and maintenance of tailings dams have been regulated and the relevant regulation is copied herewith, both for your information and as a guideline to the commissioning, management, operation, closing and aftercare of a tailings deposition facility.

Regulation 73 promulgated under the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) requires the following:

Management of residue stockpiles and deposits

56. (1) *The assessment of impacts relating to the management of residue stockpiles and deposits, where appropriate, must form part of the environmental impact assessment report and environmental management programme or the environmental management plan.*
- (2) *Residue characterization*
- (a) *Mine residue must be characterized to identify any potentially significant health and safety hazard and environmental impact that may be associated with the residue when stockpiled or deposited at the site(s). under consideration.*
 - (b) *Residue stockpiles and deposits must be characterized in terms of its -*
 - (i) *physical characteristics, which may include -*
 - (aa) *the size distribution of the principal constituents;*
 - (bb) *the permeability of the compacted material,*
 - (cc) *void ratios of the compacted material,*
 - (dd) *the consolidation or settling characteristics of the material under its own weight and that of any overburden;*
 - (ee) *the strength of compacted material;*
 - (ff) *the specific gravity of the solid constituents; and*

- (gg) the water content of the material at the time of deposition, after compaction, and at other phases in the life of the deposit.
- (li) chemical characteristics, which may include
 - (aa) the toxicity;
 - (bb) the propensity to oxidize and/or decompose;
 - (cc) the propensity to undergo spontaneous combustion;
 - (dd) the pH and chemical composition of the water separated from the solids;
 - (ee) stability and reactivity and the rate thereof; and
 - (ff) neutralizing potential.
- (iii) mineral content, which include the specific gravity of the residue particles and its impact on particle segregation and consolidation;

Classification of residue stockpiles and deposits

- (a) All residue stockpiles and deposits must be classified into one or a combination of the following categories -
 - (i) the safety classification to differentiate between residue stockpiles and deposits of high, medium and low hazard on the basis of their potential to cause harm to life or property; and
 - (ii) the environmental classification to differentiate between residue stockpiles and deposits with -
 - (aa) a potentially significant impact on the environment due to its spatial extent, duration and intensity of potential impacts; or
 - (bb) no potentially significant impact on the environment.
- (b) All mine residue stockpiles and deposits must be classified by a suitably qualified person(s).
- (c) The classification of residue stockpiles and deposits shall determine the -
 - (i) level of investigation and assessment required;
 - (ii) requirements for design, construction, operation, decommissioning, closure and post closure maintenance; and
 - (iii) qualifications and expertise required of persons undertaking the investigations, assessments, design, and construction thereof.
- (d) The safety classification of residue stockpiles and deposits shall be based on the following criteria -

<i>Number of residents in zone of influence</i>	<i>Number of workers in of influence</i>	<i>Value of third party property in zone of influence</i>	<i>Depth to underground mine workings</i>	<i>Classification</i>
<i>0</i>	<i>< 10</i>	<i>0 - R2 m</i>	<i>> 200m</i>	<i>Low hazard</i>
<i>1-10</i>	<i>11-100</i>	<i>R 2 m - R20 m</i>	<i>50 m - 200 m</i>	<i>Medium hazard</i>
<i>>10</i>	<i>> 100</i>	<i>> R20 m</i>	<i>< 50m</i>	<i>High hazard</i>

- (e) A risk analysis must be carried out and documented on all high hazard residue stockpiles and deposits. The environmental classification of residue stockpiles and deposits must be undertaken on the basis of
 - (i) the characteristics of the residue;
 - (ii) the location and dimensions of the deposit (height, surface area);
 - (iii) the importance and vulnerability of the environmental components that are at risk; and
 - (iv) the spatial extent, duration and intensity of potential impacts.

- (g) *An assessment of the environmental impacts shall be done on all environmental components which are significantly affected.*
 - (h) *The assessment of impacts and analyses of risks shall form part of the environmental assessment and management programme.*
- (4) *Site selection and investigation:*
- (a) *The process of investigation and selection of a site must entail -*
 - (i) *the identification of a sufficient number of possible candidate sites to ensure adequate consideration of alternative sites;*
 - (ii) *qualitative evaluation and ranking of all alternative sites;*
 - (iii) *qualitative investigation of the top ranking sites to review the ranking done in (ii); (iv) a feasibility study to be carried out on the highest ranking site(s), involving - (aa) a preliminary safety classification;*
 - (bb) *an environmental classification;*
 - (cc) *geotechnical investigations; and*
 - (dd) *groundwater investigations.*
 - (b) *The geotechnical investigations may include*
 - (i) *the characterization of the soil profile over the entire area to be covered by the residue facility and associated infrastructure to define the spatial extent and depth of the different soil horizons;*
 - (ii) *the characterization of the relevant engineering properties of foundations soils and the assessment of strength and drainage characteristics,*
 - (c) *The groundwater investigations may include*
 - (i) *the potential rate of seepage from the residue facility;*
 - (ii) *the quality of such seepage;*
 - (iii) *the geohydrological properties of the strata within the zone that could potentially be affected by the quality of seepage;*
 - (iv) *the vulnerability and existing potential use of the groundwater resource within the zone that could potentially be affected by the residue facility.*
 - (d) *From these investigations, a preferred site must be identified.*
 - (e) *Further investigation on the preferred site, shall include - (i) land use, (ii) topography and surface drainage;*
 - (iii) *infrastructure and man-made features;*
 - (iv) *climate,*
 - (v) *flora and fauna;*
 - (vi) *soils;*
 - (vii) *ground water morphology, flow, quality and usage; and (viii) surface water.*
 - (f) *The investigations, laboratory test work, interpretation of data and recommendations for the identification and selection of the most appropriate and suitable site for the disposal of all residue that have the potential to generate leachate that could have a significant impact on the environment and groundwater must be carried out by a suitably qualified person.*
- (5) *Design of residue stockpile and deposit*
- (a) *The design of the residue stockpile and deposit shall be undertaken by a suitably qualified person.*
 - (b) *An assessment of the typical soil profile on the site is required for residue stockpiles and deposits which –*
 - (i) *have a low hazard potential, and*
 - (ii) *have no significant impact on the environment*

- (c) *The design of the residue stockpile and deposit must take into account all phases of the life cycle of the stockpile and deposit, from construction through to closure and must include -*
- (i) *the characteristics of the mine residue;*
 - (ii) *the characteristics of the site and the receiving environment;*
 - (iii) *the general layout of the stockpile or deposit, whether it is a natural valley, ring dyke, impoundment or a combination thereof and its 3-dimensional geometry at appropriate intervals throughout the planned incremental growth of the stockpile or deposit;*
 - (iv) *the type of deposition method used, and*
 - (v) *the rate of rise of the stockpile or deposit.*
- (d) *Other design considerations, as appropriate to the particular type of stockpile and deposit must be incorporated -*
- (i) *the control of storm water on and around the residue stockpile or deposit by making provision for the maximum precipitation to be expected over a period of 24 hours with a frequency of once in a 100 years, in accordance with the regulations made under section 8 of the National Water Act, 1998;*
 - (ii) *the provision, throughout the system, of a freeboard of at least 0.5 m above the expected maximum water level, in accordance with regulations made under the National Water Act, 1998, to prevent overtopping.*
 - (iii) *keeping the pool away from the walls; where there are valid technical reasons for deviating from this, adequate motivation must be provided and the design must be reviewed by a qualified person as required in terms of sections 9(6) or 9(7) of the Mine Health and Safety Act, 1996;*
 - (iv) *the control of decanting of excess water under normal and storm conditions;*
 - (aa) *the retention of polluted water in terms of polluted water in terms of GN R991(9), where measures may be required to prevent wafer from the residue deposit from leaving the residue management system unless it meets prescribed requirements;*
 - (bb) *the design of the penstock, outfall pipe, under-drainage system and return water dams;*
 - (cc) *the height of the phreatic surface, slope angles and method of construction of the outer walls and their effects on shear stability,*
 - (dd) *the erosion of slopes by wind and water, and its control by (ee) vegetation, berms or catchment's paddocks; and*
 - (ee) *the potential for pollution.*
- (e) *A design report and operating manual shall be drawn up for all residue stockpiles and deposits which –*
- (i) *have a medium to high hazard; and*
 - (ii) *have a potentially significant impact on the environment.*

Relevant information must be included in the draft environmental management programme or environmental management plan.

- (6) Construction and operation of residue deposits:
- (a) *The holder of any right or permit in terms of the Act, must ensure that*
- (i) *the residue deposits, including any surrounding catchment paddocks, is constructed and operated in accordance with the approved environmental management programme or environmental management plan;*
 - (ii) *the design of the residue deposit is followed implicitly throughout the construction thereof, and that any deviations from the design be approved by the Regional Manager and the environmental manage programme and environmental management plan be amended accordingly,*
 - (iii) *as part of the monitoring system, measurements of all residues transported to the site and of all surplus water removed from the site are recorded;*

- (iv) *the provision for appropriate security measures be implemented to limit unauthorized access to the site and intrusion into the residue deposit;*
 - (v) *specific action be taken in respect of any sign of pollution;*
 - (vi) *adequate measures be implemented to control dust pollution and erosion of the slopes; and*
 - (vii) *details of rehabilitation of the residue deposit be provided in the draft environmental management programme or environmental management plan.*
- (b) *A system of routine maintenance and repair in respect of the residue deposit must be implemented to ensure the ongoing control of pollution, the integrity of rehabilitation and health and safety matters at the site.*
- (7) *Monitoring of residue stockpiles and deposits:*
- (a) *A monitoring system for residue stockpiles and deposits with respect to potentially significant impacts as identified in the environmental assessment must be included in the environmental management programme or environmental management plan.*
 - (b) *In the design of a monitoring system for a residue stockpile or deposit, consideration must be given to -*
 - (i) *baseline and background conditions with regard to air, surface and groundwater quality.*
 - (ii) *the air, surface and groundwater quality objectives;*
 - (iii) *residue characteristics;*
 - (iv) *the degree and nature of residue containment;*
 - (v) *the receiving environment and specifically the climatic, local geological, hydrogeological and geochemical conditions;*
 - (vi) *potential migration pathways;*
 - (vii) *potential impacts of leachate;*
 - (viii) *the location of monitoring points and the prescribed monitoring protocols; and*
 - (ix) *the reporting frequency and procedures.*
- (8) *Decommissioning, closure and aftercare:*
- (a) *The decommissioning, closure and post closure management of residue deposits must be addressed in the closure plan, which must contain the following -*
 - (i) *the environmental classification, including assumptions on which the classification were based;*
 - (ii) *the closure objectives, final land use or capability;*
 - (iii) *conceptual description and details for closure and post closure management; (iv) cost estimates and financial provision for closure and post-closure management; and*
 - (v) *residual impacts, monitoring and requirements to obtain mine closure in terms of the Act.*

F 3.6 FINAL REHABILITATION

- 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.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

F 4 MONITORING AND REPORTING

F 4.1 Inspections and monitoring

- Regular monitoring of all the environmental management measures and components shall be carried out by the holder of the prospecting right, mining permit or reconnaissance permission in order to ensure that the provisions of this programme are adhered to.
- Ongoing and regular reporting of the progress of implementation of this programme will be done. • Various points of compliance will be identified with regard to the various impacts that the operations will have on the environment.
- Inspections and monitoring shall be carried out on both the implementation of the programme and the impact on plant and animal life.
- Visual inspections on erosion and physical pollution shall be carried out on a regular basis.

Regulation 55 promulgated in terms of the MPRDA requires the following:

Monitoring and performance assessments of environmental management programme or plan
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- (1) *As part of the general terms and conditions for a prospecting right, mining right or mining permit and in order to ensure compliance with the approved environmental management programme or plan and to assess the continued appropriateness and adequacy of the environmental management programme or plan, the holder of such right must*
 - (a) *conduct monitoring on a continuous basis;*
 - (b) *conduct performance assessments of the environmental management programme or plan as required, and*
 - (c) *compile and submit a performance assessment report to the Minister to demonstrate adherence to sub-regulation (b).*
- (2) *The frequency of performance assessment reporting shall be*
 - (a) *in accordance with the period specified in the approved environmental management programme or plan, or, if not so specified;*
 - (b) *as agreed to in writing by the Minister; or*
 - (c) *biennially (every two years).*
- (3) *The performance assessment report, shall be in the format provided in guidelines that will from time to time be published by the Department and shall as a minimum contain*
 - (a) *information regarding the period that applies to the performance assessment;*
 - (b) *the scope of the assessment;*
 - (c) *the procedure used for the assessment; -*
 - (d) *the interpreted information gained from monitoring the approved environmental management programme or plan;*

- (e) *the evaluation criteria used during the assessment,*
 - (f) *the results of the assessment; and*
 - (g) *recommendations on how and when deficiencies that are identified and/or aspects of non-compliance will be rectified.*
- (4) *The holder of a prospecting right mining right or mining permit may appoint an independent qualified person(s) to conduct the performance assessment and compile the performance assessment report provided that no such appointment shall relieve the holder of the responsibilities in terms of these regulations.*
- (5) *Subject to section 30(2) of the Act, the performance assessment report submitted by the holder shall be made available by the Minister to any person on request.*
- (6) *If upon consideration by the Minister, the performance assessment executed by the holder is not satisfactory or the report submitted by the holder is found to be unacceptable, the holder must*
- (a) *repeat the whole or relevant parts of the performance assessment and revise and resubmit the report; and/or*
 - (b) *submit relevant supporting information; and/or*
 - (c) *appoint an independent competent person(s) to conduct the whole or part of the performance assessment and to compile the report.*
- (7) *If a reasonable assessment indicates that the performance assessment cannot be executed satisfactorily by the holder or a competent person(s) appointed by the holder, the Minister may appoint an independent performance assessment person(s) to conduct such performance assessment. Such appointment and execution shall be for the cost of the holder.*
- (8) *When the holder of a prospecting right, mining right or mining permit intends closing such operation, a final performance assessment shall be conducted and a report submitted to the Minister to ensure that -*
- (a) *the requirements of the relevant legislation have been complied with,*
 - (b) *the closure objectives as described in the environmental management programme or plan have been met, and*
 - (c) *all residual environmental impacts resulting from the holder's operations have been identified and the risks of latent impacts which may occur have been identified, quantified and arrangements for the management thereof have been assessed.*
- (9) *The final performance assessment report shall either precede or accompany the application for a closure certificate in terms of the Act*

F 4.2 Compliance reporting 1 submission of information

- *Layout plans will be updated on a regular basis and updated copies will be submitted on a biennial basis to the Regional Manager*
- *Reports confirming compliance with various points identified in the environmental management programme will be submitted to the Regional Manager on a regular basis and as decided by the said manager.*
- *Any emergency or unforeseen impact will be reported as soon as possible.*
- *An assessment of environmental impacts that were not properly addressed or were unknown when the programme was compiled shall be carried out and added as a corrective action.*

F 5 CLOSURE

When the holder of a prospecting right, mining permit or reconnaissance permission intends closing down his/her operations, an environmental risk report shall accompany the application for closure. The requirements of such a risk report is contained in Regulation 60 of the Regulations promulgated in terms of the Act and is quoted below:

F 5.1 ENVIRONMENTAL RISK REPORT

An application for a closure certificate must be accompanied by an environmental risk report which must include

- (a) the undertaking of a screening level environmental risk assessment where
 - (i) all possible environmental risks are identified, including those which appear to be insignificant;*
 - (ii) the process is based on the input from existing data;*
 - (iii) the issues that are considered are qualitatively ranked as –
 - (aa) a potential significant risk, - and/or*
 - (bb) a uncertain risk; and/or*
 - (cc) an insignificant risk***
- (b) the undertaking of a second level risk assessment on issues classified as potential significant risks where
 - (i) appropriate sampling, data collection and monitoring be carded out,*
 - (ii) more realistic assumptions and actual measurements be made, and*
 - (iii) a more quantitative risk assessment is undertaken, again classifying issues as posing a potential significant risk or insignificant risk.**
- (c) assessing whether issues classified as posing potential significant risks are acceptable without further mitigation;*
- (d) issues classified as uncertain risks be re-evaluated and reclassified as either posing potential significant risks or insignificant risks;*
- (e) documenting the status of insignificant risks and agree with interested and affected persons;*
- (f) identifying alterative risk prevention or management strategies for potential significant risks which have been identified, quantified and qualified in the second level risk assessment;*
- (g) agreeing on management measures to be implemented for the potential significant risks which must include
 - (i) a description of the management measures to be applied,*
 - (ii) a predicted long-term result of the applied management measures;*
 - (iii) the residual and latent impact after successful implementation of the management measures*
 - (iv) time frames and schedule for the implementation of the management measures;*
 - (v) responsibilities for implementation and long-term maintenance of the management measures;*
 - (vi) financial provision for long-term maintenance; and (vii) monitoring programmes to be implemented.'**

F 5.2 CLOSURE OBJECTIVES

Closure objectives form part of this EMPlan and must

- (a) identify the key objectives for mine closure to guide the project design, development and management of environmental objectives;
- (b) provide broad future land use objective(s) for the site; and
- (c) provide proposed closure cost

F 5.3 CONTENTS OF CLOSURE PLAN

A closure plan forms part of the EMP and must include the following:

- (a) a description of the closure objectives and how these relate to the prospecting or mine operation and its environmental and social setting;
- (b) a plan contemplated in Regulation 2(2), coordinated according to generally accepted standards, showing the land or area under closure;
- (c) a summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management programme or plan;
- (d) a summary of the results of the environmental risk report and details of identified residual and latent impacts;
- (e) a summary of the results of progressive rehabilitation undertaken;
- (f) a description of the methods to decommission each prospecting or mining component and the mitigation or management strategy proposed to avoid, minimize and manage residual or latent impacts;
- (g) details of any long-term management and maintenance expected;
- (h) details of financial provision for monitoring, maintenance and post closure management, if required;
- (i) a plan or sketch at an appropriate scale describing the final land use proposal and arrangements for the site;
- (j) a record of interested and affected persons consulted; and
- (k) technical appendices, if any.

F 5.4 TRANSFER OF ENVIRONMENTAL LIABILITIES TO A COMPETENT PERSON

Should the holder of a prospecting right, mining permit or reconnaissance permission wish to transfer any environmental liabilities and responsibilities to another person or persons, the following will pertain:

- (1) An application to transfer environmental liabilities to a competent person in terms of section 48) of the Act, must be completed on Form 0 as set out in Annexure 1 to the Regulations and be lodged to the Minister for consideration.
- (2) The holder of a prospecting right, mining right or mining permit may transfer liabilities and responsibilities as identified in the environmental management plan and the required closure plan to a competent person as contemplated in Regulation 58.
- (3) When considering the transfer of environmental liabilities and responsibilities in terms of section 48) of the Act, the Minister must consult with any State department which administers any law relating to matters affecting the environment.
- (4) No transfer of environmental liabilities and responsibilities to a competent person may be made unless the Chief Inspector of Mines and the Department of Water Affairs and Forestry have confirmed in writing that the person to whom the liabilities and responsibilities is transferred to, have the necessary qualifications pertaining to health and safety and management of potential pollution of water resources.

F 5.5 NOTES ON LEGAL PROVISIONS

NOTE: The holder of a prospecting right, mining permit or reconnaissance permission must also take cognizance of the provisions of other legislation dealing with matters relating to conservation, and which include, inter alia, the following:

- National Monuments Act, 1969 (Act 28 of 1969). National Parks Act, 1976 (Act 57 of 1976)
- Environmental Conservation Act, 1989 (Act 73 of 1989) National
- Environmental Management Act, 1998 (Act No. 107 of 1998)
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- The National Water Act, 1998 (Act 36 of 1998)
- Mine Safety and Health Act, 1996 (Act 29 of 1996)
- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

G. SPECIFIC ADDITIONAL REQUIREMENTS DETERMINED BY THE REGIONAL MANAGER.

Officials in regional offices may use the following matrix to determine the necessity for additional objectives to be included in this Section of the document:

POTENTIAL ENVIRONMENTAL IMPACTS OF MINING										
Activity	Disturbance					Pollution				Visual
	Landform	Soil	Flora	Fauna	Heritage e	Land	Water	Air	Noise	
Mining										
Access										
Topsoil removal										
Overburden removal										
Mineral Extraction										
Tailings disposal										
Water Abstraction										
Pipeline route										
Trans wrt										
Accommodation										
Waste disposal										
Electricity										
Hydrocarbon storag										
Workforce										

Please indicate VL, L, M, H, and VH for very Low, Low, Medium, high and Very High in each column to determine main area and severity of impact

G. This section outlines the specific additional requirements that may be set for the operation by the Regional Manager. Additional requirements will only have been set if the Regional Manager is of the opinion that there are specific impacts on the environment which will not be adequately mitigated by the provisions set within the standard version of the Environmental Management Plan. These requirements form part of the Environmental Management Plan and all elements and instructions contained herein must be complied with by the applicant.

H. UNDERTAKING

I.....**N.A.Bleeker**.....
....., the undersigned and duly authorized thereto by

.....**Injula Mining Operations (Pty) Ltd**.....

Company / ~~Close Corporation~~ / ~~Municipality~~ (Delete that which is not applicable) have studied and understand the contents of this document in it's entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Regional Manager in Section G and approved on

Signed at this day of.....20.....



.....
Signature of applicant

Chief Geologist / Exploration

.....
Designation

Agency declaration: This document was completed byon behalf of.....

J. APPROVAL

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002
(Act 29 of 2002)

Signed at..... this day of..... 20.....

.....
REGIONAL MANAGER

REGION:.....

This document has been compiled by the Directorate: Mine Environmental Management of the Department of Minerals and Energy at their Head Office in Pretoria. Any comments, suggestions or inputs will be sincerely appreciated. If you have any comments or suggestions regarding this document or its application, please forward your contribution to:

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