REPUBLIC OF NAMIBIA

ENVIRONMENTAL MANAGEMENT PLAN FOR DIMENSION STONE COMPANIES
BEING APPENDIX A TO THE PRO-FORMA ENVIRONMENTAL CONTRACT

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PART 1. GENERAL INFORMATION

1. Background information

1.1 Companies (or individuals) applying for an EXCLUSIVE PROSPECTING LICENCES/ MINING CLAIM/ MINING LICENCE for exploration/ mining operations must complete this Environmental Management Plan (EMP).

1.2 The answers provided in this EMP shall be regarded as commitments which will become part of the **Environmental Contract** between the claim holder/ licence holder and the Government of the Republic of Namibia, duly represented by the Ministry of Environment and Tourism (MET) and the Ministry of Mines and Energy (MME).

1.3 Once the holder has completed this EMP the MET and MME will either accept / reject / request further information regarding the environmental commitments made therein. The MET and MME reserve the right to add further conditions.

1.4 Once agreed to by all parties concerned, the completed questionnaire shall form part of the **Environmental Contract**.

1.5 Please attach locality and lay out map of the mining area and a copy of the MC/ML application as instructed in chapter 2.2.

2. Holder details

2.1 Name of Holder	
2.2 Name of Chief Executive Officer (if a company)	
2.3 Telephone, Fax, Cell phone and/ or E-mail	Tel: Fax: Cell phone: E-mail:
2.4 Postal Address Residential/ Registered address	
2.5 Reference Number of the licence	ML/ MC no: Expiry:
2.6 Locality of exploration/ mining area	Region: District: Corner Point Latitude Longitude 1 2 3 4 5 Area: …… ha/ km2
2.6 Registered name(s) of land (farm and subdivision)	
2.7 Minerals to be explored/ mined	

PART 2. PROJECT DESCRIPTION

2.1 Prospecting/ mining activities

Detailed description of the exploration/ mining programme

2.2 Mapping

Locality map

A map illustrating the locality of the operation must be available at the site for scrutiny when required. Roads, which are to be used to gain access to the site, are to be clearly marked on a locality plan. A copy of a 1:50000 topocadastral map may be used or this purpose. On the map, the longitude and latitude of the approximate centre of the site must be established and entered into the space provided below. The locality map must be appended to the EMP.

Layout plan (compulsory for mining licences/ adviced for exclusive prospecting licences and mining claims)

A layout plan drawn to a reasonable, practical scale (e.g. 1:1000), indicating the main infrastructural features of the operation must be appended to the EMP. The plan must be neatly drawn and must show contours and dimensions.

Indicate with a Y (yes) or N/A (for not applicable) if the following is included on the layout plan which is attached	**Y of N/A**
North point and scale	
Operation area	
Full description of property, adjacent property and position of boundaries	
Access road to site	
Haul roads	
Beacons	
Stockpiles, (waste) dumps, extent of operation areas	
Office, camp site & ablution blocks	
Topography of the immediate vicinity of the operation area	
Power lines, roads and other infrastructure	
Adjacent housing and other dwellings	
Places of special interest (archaeological sites)	
Store room for blasting products	
Workshop area	
Storm-water channel	
Other infrastructure (specify)	

2.3 Transportation and processing equipment

Type of vehicle	Specify the type	Quantities
Light vehicles		
Trucks		
Earthmoving equipment		
Drilling equipment		
Processing plant		
Other (specify):		

2.4 Infratructure

Type of Infrastructure	Specify	Quantity
Housing		
Water storage		
Ablution blocks/ toilets		
Other		

2.5 Waste stream related issues

Waste type	Quantities of waste generated per month (estimates)	Method of storage	Method of disposal	Disposal site
Industrial waste				
Hazardous waste				
Domestic waste				
Other				

2.6 Water

Activity or category of use	Quantity of water needed per month (litres)	Source for water extraction (e.g. river, own borehole, water affairs connection, etc…)

2.7 Power Supply

What power source(s) will be used?:

2.8 Employment

Different categories and number of persons to be employed	The work they will do	Will the persons live on site (yes/no)	If non-resident, how often will they visit

2.9 Existing Damage

Describe what environmental damage exists in your site/ prospecting/ mining area now, in other words, damage caused by someone else before you began prospecting in the area (provide evidence such as photo's, statements, etc.)

PART 3. BRIEF DESCRIPTION OF THE ENVIRONMENT

General geology & Soil:

Climate:

Topography and visual overview:

Land Use:

Natural vegetation/ plant life:

Animal life:

Surface water:

Ground water: Sites of archaeological and cultural interest:

PART 4. FINANCIAL PROVISION

Details of financial provision made for rehabilitation: Method: How much N$ are provided:

PART 5. ENVIRONMENTAL MANAGEMENT PLAN

Non-exhaustive list of possible significant environmental impacts requiring mitigation

Significant environmental impacts requiring mitigation	Sources of impacts	Mitigation measures	Monitoring Actions and methods	Responsibilities for implementation	Resources required for the implementation
1. Pollution					
Accidental/ Negligent Spillage's	Vehicles, earthmoving equipment	• Spillage's of any potentially toxic materials, whether by accident or through negligence, should be reported immediately and corrective action undertaken • Design structures and transfer equipment so as to avoid as much spillage's as possible • Train staff on how to make diesel/fuel transfer avoiding spillage's • Any spill should be cleaned up immediately by removing the spill together with the polluted soil and disposing of it at a recognised dumping facility to the satisfaction of the MET	Weekly monitoring of all equipment (visual check)	Mine Manager	
Workshop and Plant Area	Generators, vehicles, earthmoving equipment	• Oil traps will be installed in all appropriate places to collect potentially toxic materials • All diesel generators on site will be placed on concrete slabs • The entire work area of the workshop must be lined by concrete • Any runoff from the workshop/plant area, either arising from washdowns or rainfall, should be channeled into the pollution control pond	Weekly monitoring of the workshop and plant area (visual check)	Mine Manager	
2. Waste					
Domestic waste (visual and ecological impacts of refuse littering, domestic waste disposal)	Workforce	• Non-biodegradable and biodegradable refuse shall be stored in a container / refuse skip and collected on a regular basis and disposed of at a recognised disposal facility. Precautions shall be taken to prevent any refuse from spreading on and from the camp site. The container should also be covered with a mesh "lid" to control access by pest animals	Weekly monitoring of the containers/ when full transport it to a recognised waste disposal facility	All on site/ supervised by Mine manager	

Significant environmental impacts requiring mitigation	Sources of impacts	Mitigation measures	Monitoring Actions and methods	Responsibilities for implementation	Resources required for the implementation
Industrial waste (including scrap metal)		• Store the waste at a site close to the workshop • Remove it to a recognized waste disposal facility on a regular basis	Three monthly assessment of the generated quantities. Remove if more than $20m^3$	Mine manager	
3. Stripping and Stockpiling Soils					
Stripping and stockpiling (dust and covering of gravel areas with stockpiles)	New pits	• The upper layer of the soil will be valuable to the rehabilitation process because it contains a seedbank of dormant seeds. • This layer must be stripped and stockpiled separately • The soil stock pile will be surrounded by larger blocks to protect from wind erosion	Visual check on wind erosion/ control of plastic sheeting on a three monthly basis	Mine manager	Resistant plastic sheeting of at least 350 micron
Waste rocks (70% of mined pits)	New pits	• Design for closure principles • Separate waste rocks as well as stockpiled soils in order to allow easy rehabilitation • Follow closely the market demands in the world so as to avoid unnecessary storage of blocks	Measure the aerial extent and the height of the waste pile, at least once a year	Mine manager	
4. Tracks and Roads					
Fixed routes (potential damage to the substrate caused by heavy vehicles and off-road vehicles)	Vehicles, Trucks, Earthmoving equipment	• Haphazard driving across the veld where there are no existing routes must be avoided. • The use of fixed routes will reduce the visual impact and minimise the need for post-mining rehabilitation of the tracks	Weekly visual check	All drivers supervised by Mine Manager	
Road Safety (Safety of surrounding residents and land users, other motorists and animals must not be compromised by the vehicles associated with the mining operation)	Vehicles, Trucks, Earthmoving equipment	• Headlights must be switched on at all times • All vehicles, trucks moving in the mining area should not exceed 40km/h with warning and speed signs at relevant locations • All personnel responsible for driving the transport vehicles must be in a possession of a valid drivers licence • Access points off the gravel road to the mining area should be well signposted in advance	Daily monitoring (visual checks)	All drivers supervised by Mine Manager	

Significant environmental impacts requiring mitigation	Sources of impacts	Mitigation measures	Monitoring Actions and methods	Responsibilities for implementation	Resources required for the implementation
Haul Road Utilisation (Source of various forms of pollution: dust noise, visual)	Vehicles, Trucks, Earthmoving equipment	• Drivers may not exceed the general speed limit along the haul road of 40 km/h • There should be no littering along the road, dumping of waste and scrap, etc. and all drivers should be made aware of this	Daily monitoring (visual checks)	All drivers supervised by Mine Manager	
5. Water Abstraction and Supply					
Water abstraction and pipelines	Mining activities	• Pipelines laid to a site shall be done in such a manner that the surface and natural vegetation are not unduly disturbed	Weekly visual checks on possible spillage's	All on site	
Water effluent	Camp site	• 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 50 m, from a 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 recognised facility	Weekly inspections of the drain	Mine manager	
Water storage on Site	Reservoirs	• Concrete reservoir walls must be painted in a camouflage colour to aid in concealing it • Reservoirs should be covered to reduce evaporation • Reservoirs should not be visible from the main road	Weekly visual checks of the reservoirs	All on site, supervised by Mine Manager	
Water conservation strategies (including recycling)	Work related cutting, cooling, washing,…	• Water should be recovered from the cutting, cooling and washing stages • Advice the workforce to be sparing with the water for human consumption	Check the domestic water consumption on a three monthly basis	Mine Manager	

Significant environmental impacts requiring mitigation	Sources of impacts	Mitigation measures	Monitoring Actions and methods	Responsibilities for implementation	Resources required for the implementation
6. Vegetation					
Preservation of communities (to ensure minimal disruption of important vegetation communities and valuable plant specimens)	Vehicles, trucks and earthmoving equipment Clearance for firewood	• Alternative fuel and/or power sources must be made available (paraffin stoves, diesel-driven generators) if workers are accommodated on site • No trees or shrubs will be felled or damaged for the purpose of obtaining firewood • Haphazard driving across the veld where there are no existing routes must be avoided	Daily inspections Weekly check whether the stock of alternative sources is sufficient	Mine Manager All on site	
Sources of plant material for rehabilitation (to ensure the maximum use of the local plant material for rehabilitation process)	New pits	• Before new site construction begins, the upper layer of the soil must be stripped and stockpiled separately so that this layer can be utilised in the rehabilitation process	Visual check on wind erosion on a monthly basis	Mine Manager	
7. Fauna					
Impacts on resident animal's habitat	Mining operations	• No hunting and trapping will be allowed • Fence off the pits (the fences must be sufficient to control the access of large and small animals) or alternatively put a berm with waste material	Weekly visual check of the fence	All staff reporting to the Mine Manager	
8. Noise (including blasting activities)					
Impacts on adjacent settlements/ workforce	Generator, earthmoving equipment, cutting equipment, blasting	• The generator should be positioned away from the base camp and has boarding to help suppress noise • Blasting should be limited to the strict necessary and should be in compliance with the Explosive Act, 1961.	Weekly "hearing" check of the generator and other equipment (trucks/ cutting machinery)	Mine Manager	
9. Dust					
Impacts on air quality in general/ flora & fauna/ workforce	Excavation areas including pits and trenches, vehicles	• The general speed limit on the haul road should be 40km/h if possible	Daily (visual) monitoring of transport activities and dust generation on the mine	All on site Supervised by Mine Manager	

Significant environmental impacts requiring mitigation	Sources of impacts	Mitigation measures	Monitoring Actions and methods	Responsibilities for implementation	Resources required for the implementation
10. Visual Impacts					
Impacts on surrounding land users/ tourists	Waste & stockpile dumps/ dust/ Infrastructure	• Sites to be established away from the tourist routes • Limit the height and aerial extent of the waste and stockpile dumps (may not visible from the road) • Ensure that all structure on site are blending with the surrounding landscape • Minimise dust generation from vehicles on the haul road so as not to draw attention to this area	Measure the aerial extent and the height of the waste pile, at least once a year Daily visual checks	Mine Manager	
11. Neighboring communities and or the general public					
Informal settlements/ tourists	Noise/ dust/ visual impacts/ attitude	• Enhance communication with the neighbouring communities • Assist communities where possible	Visit the communities at least once a month in order to maintain good relationship	Mine Manager	
12. Historical, archaeological and cultural heritage					
Impacts on archaeological and cultural heritage sites	Blasting/ drilling	• Careful examination of the area before any blasting and/ or drilling is undertaken. Immediately advice the National Monuments Council if archaeological and/ or cultural heritage sites are found •	Thorough inspection of rocks before any drilling and/ or blasting is undertaken	Mine Manager National Monuments Council (NMC)	
13. Accommodation and sanitation					
Accommodation Sanitation (Impacts on water pollution)	Camp and office sites All staff	• no camp or office site shall be located closer than 50 meters from a spring, river, dam or pan • The area required for the camp and office site must be kept to a minimum • • Chemical toilet facilities (preferred) or other approved toilet facilities such as a septic drain shall be used and sited on the camp site in a way that they do not cause water or other pollution			

Significant environmental impacts requiring mitigation	Sources of impacts	Mitigation measures	Monitoring Actions and methods	Responsibilities for implementation	Resources required for the implementation
15. Rehabilitation (before starting any final rehabilitation, advice the Ministry of Environment and Tourism to set the term and conditions)					
Mining void	Excavated trenches, pits, etc	• Refill pit alternately with waste and not saleable stockpiled blocks and smaller fragments of larger blocks. This systematic replacement can only be achieved if the different fractions are separated during excavations (design for closure principle) • Cover refilled rock waste with saved topsoil, complemented if necessary by scraping the area adjoining the pit on the condition that no vegetation is cleared for this operation	All rehabilitated areas should be monitored over a 4 year period from the onset of the rehabilitation procedures. The frequency of monitoring suggested is dependent on satisfactory performance. If however the requirements are not being met, the frequency Of monitoring can be increased. It is suggested that the monitoring be conducted once a year a round January when the grasses are flowering. The rehabilitated areas can be monitored in two ways:	Qualified personnel from the company/ Accredited agent/ MET	
All waste and unwanted materials	Domestic and industrial waste	• Collect remaining domestic waste on site and transport it to a recognised disposal facility • Clean out the oil traps, collect the waste material in drums and transport to a recognised disposal facility • Manually remove all weedy species that are present at the site			
All structures	Base camp constructions, workshop, processing plant, water tanks	• Upon cessation of all mining activities remove the workshop, surrounding fences, generators and any scrap material in the vicinity of the workshop • Seal all petrol, diesel, oil and grease containers and remove from the site to a recognised storage facility • Break up all concrete slabs and structures on site and transport the fragments to a suitable site for disposal or dump it in one of the pits. • Pending the approval by relevant authorities, the company may donate the remaining buildings, such as the workers quarters, office complex and the manager's house, to organizations aimed at uplifting the standards of the local communities	1. sampling randomly located 1m^2 quadrats. Approximately 10 quadrats per hectare (or a minimum of 3) should be sampled per plant community. The factors that will be examined in each quadrate include: • Percentage basal cover • Percentage aerial cover • Species composition & diversity • Vigor and health of plants • Presence of and evidence of fauna • Nature of the substrate		
Stormwater channel	Channel	• Replace the subsoil layer by backfilling the soil on top of the overburden and contour • Cap the subsoil with a topsoil layer about 10cm	To enable a comparison, control plots located within the surrounding unmined areas		

Significant environmental impacts requiring mitigation	Sources of impacts	Mitigation measures	Monitoring Actions and methods	Responsibilities for implementation	Resources required for the implementation
(Diversion of the natural flow) All roads and substrate underlying the waste dumps, pipeline and areas covered by concrete	Vehicles and all (mining) infrastructure	deep • Cap the topsoil containing the seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake • Rip the road surface/ substrate to a depth of at least 50 cm using a multi-toothed ripper and tractor or similar method • Disk the ripped surface to break up the clods • Cover with a layer of topsoil (if available) to a depth of about 10cm • Cap the topsoil containing the seedbank with a gravel layer by manually spreading the fragments across the surface using a rake	should also be monitored. Approximately 5 to 10 quadrats of 1m2 should be sampled per community type to set the controls. 2. Photographic evidence at different rehabilitated places with a camera providing dates on the prints. Photographs should be taken every year around the same period at the same places and should be commented (visual observations)		

PART 6. CODE OF CONDUCT FOR THE WORKFORCE

No worker (permanent, contract or temporary) will be permitted to do the following

Fauna:

1. Hunt or kill or set devices to trap wild animals (including birds, reptiles and small mammals) and livestock
2. Harass wild animals or livestock
3. Tamper with or destroy nesting sites, lairs or any other form of animal shelter
4. Consciously tamper with or destroy any animal species
5. Feed the native animals
6. Leave the site untidy and strewn with rubbish which attract animal pests
7. Bring his/her own pets on to the site, except if landowners allows

General:

1. Tress pass on surrounding farms or any other property not included within the operating area without prior consent
2. Carry a weapon on the site or in the vehicles transporting them to and from the site, except if landowners allows
3. Disturb or destroy any grave sites/ rock paintings located within or surrounding area

Roads, Vehicles and Driving:

1. Drive a construction or other type of vehicle associated with the project under the influence of alcohol
2. Exceed the speed limit on the access road
3. Drive a vehicle on the property which is causing excessive noise (Broken vehicles must be reported and repaired as soon as possible)
4. Litter along the roadsides, including both the public roads and the access road

Vegetation:

1. Remove or destroy vegetation from the site without prior consent
2. Tamper with, destroy or remove the vegetation within the demarcated preservation areas
3. Cut down trees for firewood

Water and Water Courses:

1. Consciously cause pollution of water courses (whether flowing or not)
2. Cause pollution whether through littering, disposal of sewage, fuel or oil from the vehicles or other forms of pollution not covered

PART 7. MONITORING

The Mine Manager will keep an environmental log that will be attached to the compulsory yearly reports to be handed over to the Ministry of Environment and Tourism. In case of non-compliance, the Mine Manager should elaborate on the corrective action that have been taken and the result thereof.

The holder shall submit every year an Environmental Report to the Ministry of Environment and Tourism according to the prescribed format.

Staff from the Ministry of Environment and Tourism and / or the Ministry of Mines and Energy may at any time inspect prospecting/ mining areas.

PART 8. STATUTATORY REQUIREMENTS

The holder of a prospecting licence or mining claim/ licence shall remain liable for complying with the relevant provisions of the Minerals (Prospecting and Mining) Act, 1992.

The holder of a prospecting licence or mining claim/ licence must also take cognizance of the provisions of other acts dealing with matters relating to the conservation of the environment and which include, inter alia, the following:

- The Environmental Management Act, 1999
- The Nature Conservation Ordinance, (Ordinance 4 of 1975)
- Soil Conservation Act, 1969
- Forest Act 72, 1968
- Water Act 54, 1956
- Public Health Act 36, 1919