RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

GOBINDAPUR DECORATIVE STONE MINES

The mining activities involve certain types of hazards, during operation, which can disrupt normal activities abruptly and lead to disaster like fires, inundation, failure of machinery, explosion, slope failure etc. The impending dangers or risks which need be investigated addressed, disaster management plan formulated with an aim to taking precautionary steps to avert disaster and also to take such action after the disaster which limits the damage to the minimum.

OBJECTIVES

The objectives of environmental risk assessment are governed by the following, which excludes natural calamities:

a) To identify the potential hazardous areas so that necessary design safety measures can be adopted to minimize the probability of accidental events.
b) To identify the potential areas of environmental disaster which can be prevented by proper design of the installations and its controlled operation?
c) To manage the emergency situation or a disastrous event, if any, from the mining operation.

The major hazards related to the mining activities are as follows:

- Open cast bench slope failure
- Accident due to fall of quarry sides
- Accident due to machineries
- Accident due to explosives
- Accident due to large block cutting, separation and loading

ENVIRONMENTAL RISK EVALUATION

From environmental hazards point of view for the mining activities and processing of ore in various point of work the relative risk potential analysis is made on the following three factors:

- Likelihood of occurrence
- Likelihood of detection
- Severity of consequence

Each of these factors is graded and compiled to determine the risk potential. The factors governing the determination of relative risk potentials are presented in the **table 7.1.**

Determination of Risk Potential

A	B	C

Likelihood of occurrence		Likelihood of detection		Severity of consequence	
Criteria	**Rank**	**Criteria**	**Rank**	**Criteria**	**Rank**
Very High	5	Very High	1	None	2
High	4	High	2	Minor	4
Moderate	3	Moderate	3	Low	6
Low	2	Low	4	Moderate	8
Very Low	1	Very Low	5	High	10

Risk Potential (Rp) = (A + B) x C

Based on the above stated criteria for assessing the risk**,** each probable event has been evaluated by addressing several questions on the probability of event occurrence in view of the in-built design features detection response**,** operational practice and its likely consequence**.**

In order to take care of above hazards/disasters, the following will be strictly followed:

- Working of mines as per approved plans.
- Regular maintenance and testing of all mining equipment as per manufacturer's guidelines.
- Provision of adequate capacity pumps for pumping out water from the mining pit with standby arrangements.
- Checking and regular maintenance of garland drains and earthen bunds.
- Entry of unauthorized persons will be prohibited.
- Periodic checking of worthiness of fire fighting and first aid provision in the mining area.
- Training and refresher courses for all the employees.
- Cleaning of mining faces regularly.
- As a part of disaster management plan, a rescue team will be formed by imparting specialized training to select mining staff.

The major risk associated with the project activities are as follows:

Open Cast Bench Slope Failure

The bench slopes are to be monitored regularly by sensitive instruments at precise level at regular intervals to check for any possible ground movement. A well-developed drainage system over the leasehold area is to ensure & checks the water flows out of the lease area.

Probable Reasons of Accident

Accidents Due To Fall of Sides

- Failure to make and keep the quarry sides secure by proper benching, sloping and keeping benches of adequate height and width.
- Undercutting so as to cause dangerous covering.
- Inadequate nos. of competent persons for carrying out statutory inspections.
- Lack of supervision.

Accidents Due To Transportation Machinery (Shovels, Trucks and Dumpers)

- During reversal operation
- Unauthorized driving of vehicles (mostly by helpers)
- Unauthorized riding of vehicles
- Attempt to ride moving vehicles
- Overloading
- Driving vehicles in a intoxicated stage
- Vehicles moving in steep gradient or on benches of inadequate width

Other Than Transportation Machinery

- Use of sub standardequipments
- Attempt to clean moving parts of machinery
- Non-provision or removal of guards from moving parts of machinery

Accidents due to Handling of Large Blocks

- During removal of large blocks
- Loading and unloading of blocks and transportation

DISASTER MANAGEMENT PLAN

To address the probable risk associate with the project activities and to minimize the risk in different stage the disaster management plan has been framed by the project implementing agency. The following precautionary measures shall be taken to prevent any kind of disaster in the mining operations:

- Top edge of opencast workings shall be kept properly fenced off to prevent failing down of man and animals.
- At the final stage, the workings shall be fenced with masonry wall (of not less that 0.13m thick and 1.2m high with a parapet top).
- The sides of excavation and the height and width of benches shall be properly maintained as per mining regulations.
- Quarrying shall be done from top downwards. No overhand will be allowed.
- Special attention and requisite precautions shall be taken while working in areas of geological weakness like existence of slip, fault etc.

- Regular dressing of bench sides to ensure safety of workers employed with in 5m of working face.
- Provision of safety belt or rope while persons are at work at the quarry sides or benches from where there are chances of falling down for more than 1.8m.
- Spoil banks not to be retained by artificial means at an angle of repose in excess of its natural angle.
- Drafting and implementation of preventive maintenance schedule for various kinds of machinery deployed in opencast workings.
- Provision of maintenance of properly laid haul roads with parapet wall fencing or guards and road signs at strategic points.
- Precautions against danger while traversing dumpers, excavators etc. by installing audio-visual alarms and appointment of spotters.
- Transportation of ore within mine workings by vehicles under the direction, supervision and control of Mine Management only.
- Proper maintenance of vehicles and weekly examination by an engineer and daily examination by a competent person.
- Training and retraining (at specified interval) of the machinery operators.
- Adequate maintenance of electrical equipment.
- Adequate illumination after daylight.