

RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN:

Risk assessment is a process whereby risks are analyzed, assessed and risk management priorities are evaluated. It is defined as the characterization of the potential adverse effect to human health & environment due to environmental hazards.

Objectives of risk assessment are:-

- Identifying hazardous activities
- Assessment of risk level and severity in different operations
- Identification of control measures
- Setting monitoring process
- Reduce the impact of mishaps of all kinds
- Reduce the inherent potential for major accidents

Methodology of Risk assessment:-

- Collection of information & identification of hazard
- Classify their severity and probability of occurrence
- Identification of exposed risks
- Assess the risk and risk rating based on
 - Probability
 - Exposure
 - Consequence
- Prioritization of the risks
- Implementation of control measures
- Monitoring risk assessment
- Evaluation and correction

Factors of risks involved due to human induced activities in connection with mining operations are 1) Failure of slopes in mine pit or in external waste dump, sub grade dump 2) Operation of HEMM and other mining machineries including transport vehicles. 3) drilling 4) blasting 5) Operation of crushing and screening plant 6) transportation of ore.

Other risk factors due to natural activities are 1) fire 2) water inundation 3) electricity and 4) natural calamities.

There are 3 adjacent iron ore mine leases being operated by project proponent for past many years. In all the three iron ore mines of M/s. KMC, these has not been any instance of major disasters or mishaps due to methodical and safe workings of the projects taking all precautionary control measures as prescribed by metalliferous Mines Regulations 1960 and other statutes like Mines Act, Mines Rules, etc.

For the various risks, likely to arise, as above, detailed analysis of causes and control measures is given in below:

7.3.1. Risk Management Plan and Control Measures:

In order to prevent damages to life and property against above possible risks, disaster management plan has been devised, as shown below with the observance of control measures therein the risk can be eliminated and avoided.

SL.NO	FACTORS	CAUSES	CONTROL MEASURES
I			
1	Failure of slopes in mine pit or in external waste dump, sub grade dump	• Bench slide in mine pit or dumps due to its unconsolidated nature. • Improper design of bench parameters. • Vibration due to movement of vehicles in the benches	• Maintaining proper bench slope to prevent sliding. • width more than the height of benches • Dumping In the waste dump in layers and dozing regularly. • Vegetation of the top and slopes of the dump to prevent erosion and providing water drainage channels. Slopes layered with Geotextile coir mats • Providing proper drainage facilities in mine and dump area. • Construction of retaining wall around dump area to stop sliding of material. • Proper maintenance of HEMM.
2	Operation of HEMM and other mining machineries including transport vehicles.	❑ Improper operation of equipments. ❑ Improper condition of the equipment. ❑ Inadequate knowledge, training and lack of safety regulation ❑ Unauthorised and improper operation ❑ Danger of being caught in the	• Formulation of safe operating procedure and implementing the same. • Creating safe working condition, providing all safety measures, devices etc. • Training the operator and others about the equipment's, the safe operating procedures, vocational, safety training etc. • Proper preventive maintenance check etc. • Guarding of moving / rotating parts, preventing entry near moving parts, maintaining all guards in their respective places.

SL.NO	FACTORS	CAUSES	CONTROL MEASURES
		moving parts.	
3	Drilling	a) Due to high pressure of compressed air hoses may burst b) Jack hammer rod may break due to weak rod	❖ Proper preventive maintenance and replacement of worn out parts. ❖ Correct and timely replacement of worn out rod
4.	Blasting	a) Fly rocks, ground vibration, noise etc. b) Improper charging of explosives c) General precautions	a) Optimized pattern for burden/spacing based on trial blast b) Minimizing explosive charge. c) Using of milli second delay detonators d) General Precautions ➤ Proper maintenance of Safety zone. ➤ Warning sound signaling for people to move to safe places
5	Operation of crushing and screening plant equipments including transport vehicles,.	❑ Improper operation of equipments. ❑ Improper condition of the equipment. ❑ Inadequate knowledge, training and lack of safety regulation ❑ Unauthorised and improper operation ❑ Danger of being caught in the moving parts.	• Formulation of safe operating procedure and implementing the same. • Creating safe working condition, providing all safety measures, devices etc. • Training the operator and others about the equipments, the safe operating procedures, vocational, safety training etc. • Proper preventive maintenance check etc. • Guarding of moving / rotating parts, preventing entry near moving parts, maintaining all guards in their respective places.
6	Transportation of ore.	a) Overloading of vehicles b) While reversing and overtaking c) Operator of truck leaving his cabin with loaded truck	a) Giving proper training to operators to avoid the causes b) Provision of Audio- Visual reverse horn c) Avoiding unauthorized person operating the vehicle.
7	Fire due to electricity and Oil	a) Due to the short circuit of cables & other electrical parts b) Due to the leakage of	- Commutator & electrical parts shall be cleaned frequently with the help of dry air blower - All fastening parts and places will be

SL.NO	FACTORS	CAUSES	CONTROL MEASURES
		inflammable liquid like diesel, oil etc,	tightened.
8	Inundation	• Direct rainfall in the mine pit. • Seepage from the strata, backfilled area. • Flow of water mainly during the monsoon in the small channels if any passing through the mine area.	• Providing adequate de-watering facility • Maintaining a surface plan with contours showing particularly low lying areas, bore holes, wells, etc. • Construction of garland drain around the active mine area to prevent any surface run off water from entering the pit. • Creating excess pumping capacity to take care of additional pumping necessities from the mine sump during Monsoon.
9	Natural calamities	Unexpected happenings	- The mine management is capable to deal with the situation

7.3.2. Emergency Planning:

Emergency preparedness planning for major hazards is significant and is now a part of planning process as required by MOEF. Although all process and operating parameters are integrated to safety, it is important to plan for emergency handling so as to face it in case it strikes.

Emergency planning exercises for on-site and off-site scenarios required for preparing a Disaster Management Plan (DMP) are different; however, they should complement each other. This study has focused on the possible hazards confined within the Premises and the corresponding action plan (On-site plan).

The responsibilities and actions expected from the Government Departments during an emergency will be sought for off-site plans.

7.3.3. Disaster Management Plan:

In order to handle disaster / emergency situations, an organisation chart entrusting responsibility to various personnel has been prepared with their specific roles during

emergency. Since there are 3 mine leases of the proponent an integrated approach and planning will be done to handle the situation.

7.3.4. Emergency Control Room:

A common emergency room is provided. This room is situated away from the places of possible risk and is provided with the following facilities:

- a. Master plan of the mines.
- b. Layout of buildings and equipments.
- c. Walky-talkie
- d. First aid boxes.
- e. Telephone line with STD facility.
- f. Emergency lighting system.
- g. Stretchers.
- h. Transport facility.
- i. Telephone numbers of various statutory officials, revenue

Department Officials, management officials, nearby fire tender office, nearby major industries having mobile fire tenders, other disaster management facilities, all the nearby hospitals (both Government & private)

Emergency control room will function as control base at the working mines.

7.3.5. Assembly Points:

Assembly points are set up farthest from the location of likely hazardous events, where pre-designated persons from the works, contractors and visitors would assemble in case of emergency. Up-to-date list of pre-designated employees of various departments (shift-wise) must be available at these points so that roll call could be taken. Pre-designated persons would take charge of these points and mark presence as the people come into it.

7.3.6 Communication System:

Different types of alarms to differentiate types of emergencies will be provided. Walkie-talkie, using predetermined codes of communication, are very useful during emergency. Cell phone can also be an effective communication arrangement.

7.3.7. Working System and Control:

The control centre are / will be located at an area of minimum risk or vulnerability in the premises concerned taking into account, the wind direction, areas which might be affected by fire/explosion, etc. for promptness and efficiency. The storage sites of high speed diesel, explosives, etc. may be divided into separate zones, which should be clearly marked on site plan.

7.3.8. Emergency Services:

This includes the fire-fighting system, first aid center, dispensary etc. Alternate sources of power supply for operating fire pumps, communication with local bodies, fire brigade etc. will also be clearly identified. Adequate number of external and internal telephone connections shall be installed.

7.3.9. Fire Protection System:

The fire protection system for the project will consist of following:

- Portable hand appliances of suitable types/capacities for extinguishing small fires in selected mine areas, storages areas such as that of Diesel, Explosives, etc.

If required, in emergency situations, the mobile fire tender system from nearby Joda or other nearby companies shall also be requisitioned for use.

7.3.10 Management Team:

The composition of the management team are:

1. Mines Manager (Respective mines)
2. Shift In-charge(Asst mines Manager)
3. Site Controller (Fore man)
4. Incident Controller (Mate)
5. Personnel/Administrative Manager
6. Communication Officer (Common)
7. Fire and Security Officer(Common)
8. Transport Coordinator(Common)
9. Medical Coordinator (Common)

7.3.11. Offsite Emergency Plan:

This being a mining project no major risk affecting the surrounding areas are expected. However, offsite emergency plan defining the various steps to tackle any offsite emergencies, which may affect surrounding areas of the project, has to be prepared after due finalizing discussion in this respect with local Panchayat official, Revenue officials and railway officials. As per this off site plan, in case of any off site emergencies, actions have to be promptly initiated to deal with such situations, in consultation with Collector, other revenue officials or concerned department officials.

7.4. Social Impact Assessment and R&R Plan:

The expansion proposal is within the existing mining lease area. Out of the total mine lease area of 27.17 Ha. About 9.39 Ha. are non forest private land. The future mining activities are confined to broken up area only and out of 9.39Ha of Non forest private land, a small patch of private vacant land temporarily will be used for sub grade dumping. The other areas will remain undisturbed. Surface rights for the entire area is already granted.

KMC has carried out highly beneficial ' CSR ' social outreach programmes in the local area. The various social upliftment activities carried out already in local community area are profiled in para 4.2.6 in Chapter IV. The total outlay for such humanitarian welfare activities carried out by project proponent in the area works out to about 6.59 crores. Further, M/s. KMC have provided budgetary outlay of about Rs75 lakhs for improvement in various spheres like education, health and hygiene, like infrastructure, sports and cultural activities, social linkage programmes like poultry farming, cattle vaccination etc.

From the above it is seen that the impact on social front due to the existing project as well as the proposed expansion are and will be positive.