

RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

1.1 RISK ANALYSIS AND CONTROL MEASURES:

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) removal of O.B and side burden 2) drilling 3) blasting 4) excavation of ore and 5) transportation of ore.

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

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

S. No	Factors	Causes of risks	Control measures
1	Removal of O.B, ore & its dump	a) Sliding of benches due to its unconsolidated nature. b) Vibration due to movement of vehicles in the benches.	The following measures will be carried out to avoid slope failure of benches, in working places. - The maximum bench slope and ultimate pit slope of 70° and 40° will be maintained. - The height & width of the OB benches will be kept as 10 m and 10-20 m.
2	Drilling	a) Due to high pressure of compressed air hoses may burst b) Jack hammer rod may break due to improper maintenance of the rod	- Periodical preventive maintenance and replacement of worn out accessories in the compressor and drill equipment. - As per manufacturers recommendation rod to be replaced and bits will be changed
3	Blasting	a) Fly rock, ground vibration and noise etc., b) Improper charging of explosives	- Burden and spacing will be kept optimum on trial basis. - Delay detonators will be used. - Maximum charge per delay will be restricted and by optimum blast hole pattern, vibrations will be controlled within the permissible limit and blast can be conducted safely.
4	Excavation of waste & Ore	a) Hauling and loading equipment are in such proximity while excavation b) Swinging of bucket over the body of tipper c) Driving of unauthorized person	- Operator shall not operate the machine when person & vehicles are in such proximity. - Shall not swing the bucket over the cab and operator leaves the machine after ensuring the bucket is on ground. - Shall not allow any unauthorized person to operate the machine by effective supervision

S. No	Factors	Causes of risks	Control measures
5	Transportation of Waste and ore	a)Operating the vehicle “nose to tail” b)Overloading of material c)While reversal & overtaking of vehicle d)Operator of truck leaving his cabin when it is loaded.	- It will be ensured that all these causes will be nullified by giving training to the operators. - No overloading. - Audio visual reverse horn will be provided. - Proper training will be given.
6	Fire due to electricity and Oil	a)Due to the short circuit of cables & other electrical parts b)Due to the leakage of inflammable liquid like diesel, oil etc.,	- Commutator & electrical parts shall be cleaned frequently with the help of dry air blower. - All fastening parts and places will be tightened.
7	Water inundation	a)Inrush of storm water due to heavy rain b)Unusual seepage of water c)Sudden collapse of peripheral bund due to torrential pour	- Since the mining operation in this lease will be in the mound above the general RL, there will not be any ingress of water or seepage.
8	Natural calamities	Unexpected happenings	- The mine management is capable to deal with the situation

1.2 DISASTER MANAGEMENT PLAN:

In the existing barytes lease of APMDC, mining operations are carried out under the management control and direction of a qualified mine manager holding a First Class Manager's certificate of competency. The DGMS have been issuing a number of standing orders, model standing orders and circulars to be followed by the mine management in case of disaster, if any. Moreover, mining staff is being sent to refresher courses from time to time to keep them alert. However, following natural/industrial hazards may occur during normal operation.

- Inundation of mine pit due to flood/excessive rain
- Slope failure of the pit and waste dumps
- Accident due to heavy mining equipment and
- Blasting and use of Explosives

In order to take care of above hazard / disasters the following control measures have been adopted in the present working mines.

- Checking and regular maintenance of garland drains and earthen bunds to avoid any inflow of surface water in the mine pit.
- Provision of high capacity standby pumps with generator sets with sufficient quantity of diesel for emergency pumping especially during monsoon.
- All safety precautions and provisions of Metalliferous Mines Regulations of 1961 is strictly followed during all mining operations.
- Entry of unauthorized persons is prohibited.
- Firefighting and first-aid provisions in the mines office complex and mining area are provided.
- Provisions of all the safety appliances such as safety boot, helmets, goggles, dust masks, ear plugs and ear muffs etc. are made available to the employees for their use.
- Training and refresher courses for all the employees working in hazardous premises.
- Observance of all safety precautions for blasting and storage of explosives as per MMR 1961.
- Working of mine, as per approved plans and regularly updating the mine plans.
- Cleaning of mine faces is regularly done.
- Carrying out handling of explosives, charging and blasting onl by qualified persons.
- A blasting SIREN is used at the time of blasting for audio signal.
- Before blasting and after blasting, red and green flags are displayed as visual signals. Checking of blasting area for any unblasted hole or material.
- Warning notice boards indicating the time of blasting and NOT TO TRESPASS are displayed prominently.
- An approved explosive van is also available for transporting explosives to the blasting site.
- Provision of magazine at a safe place when fencing and necessary security arrangement.
- Regular maintenance and testing of all mining equipment as per manufacturers guidelines.
- Suppression of dust on the haulage roads with frequent water sprinkling, etc.

- Increasing the awareness of safety and disaster through competitions, posters and annual safety weeks and environmental weeks, encouraged through suitable rewards and other similar drives.

The management is able to deal with the situations efficiently keeping in view of the likely sources of dangers in the mine.

All these measures will be suitably augmented to meet the extension and expansion project needs.

1.2.1 STRUCTURE OF DISASTER MANAGEMENT PLAN:

The existing Disaster Management Plan will be suitably augmented and is described below.

1.2.2 OUTLINE OF DISASTER MANAGEMENT PLAN:

The purpose of disaster management plan is to restore the normalcy for early resumption of mining operation due to an unexpected, sudden occurrence resulting to abnormalities in the course of mining activity leading to a serious danger to workers or any machinery or the environment.

1.2.3 SYSTEM OF COMMUNICATION:

An internal communication system is provided for the department head and to their line of command with telephone facility. Telephone nos. and addresses of adjoining mines, rescue station, police station, fire service station, local hospital, electricity supply agency and standing consultative committee members are maintained.

1.2.4 CONSULTATIVE COMMITTEE:

A standing consultative committee is formed under the head of Mines manager. The members consist of safety officer / medical officer / Asst.manager (mining) / Public Relation Officer / Foreman/ and Environmental Engineer. This team prepares the emergency plan.

1.2.5 FACILITIES AND ACCOMMODATION:

Accommodation and facilities for medical centre, rescue room and for various working groups are and will be provided. Regular checking of these facilities shall be under taken by the Asst.manager (mining).

1.2.6 FIRST AID AND MEDICAL FACILITIES:

The mine management is having first aid / medical centre for use in emergency situation. All casualties would be registered and will be given first aid. The centre will have facilities for first aid and minor treatment resuscitation, ambulance and transport. It will have proper telephone/ cell phone communication with hospitals where the complicated cases are to be referred. Regular checking of these facilities shall be under taken by the in-charge of the first aid room. The management is constructing a 10 bedded hospital near the lease area at RR-IV and a qualified doctor is already available for this hospital.

1.2.7 STORE AND EQUIPMENT:

A detailed list of equipment available, its type and capacity and items reserved for emergency will be maintained by the foremen and Asst.manager (mining).

1.2.8 TRANSPORT SERVICES:

A well-defined transport control system are and will be provided to deal with the situation. Foremen shall be made in-charge for these services.

1.2.9 FUNCTIONS OF PUBLIC RELATIONS GROUP:

It is essential to keep cordial relation with Government officials and other social service organization and working groups. Liaison with representatives of the mine workers is required to ameliorate the situation of panic, tension, sentiments, grievances and misgivings created by any disaster. Management is required to ameliorate the injured, survivors and family members of affected persons by providing material, finance, moral support and establishing contact with relatives of victims. The consultative committee formed, especially the nominated public relation officer shall look into these aspects.

1.2.10 SECURITY:

Manning of security posts is very essential during the disaster management. This shall be undertaken by the foremen.

1.2.11 CATERING AND REFRESHMENT:

Arrangements are to be made for the victims, rescue teams and others. The nominated public relation officer shall look into these aspects.

1.2.12 CARE AND MAINTENANCE DURING TEMPORARY DISCONTINUANCE:

If the mine is discontinued temporarily for more than 120 days, notice will be given 30 days before the date of such discontinuance to the concerned authorities. During discontinuance period safety arrangement and fencing will be provided to avoid the entry of unauthorized persons. The accessibility to the mine from the surface will be prevented by providing security guards and fencing arrangements. The mines manager shall take all the steps required for the care and maintenance during temporary discontinuance.

1.3 EMERGENCY PLAN:

The emergency plans adopted and to be adopted to deal with any emergency situation are described below:

Organization Plan:

Organization plan includes a clear statement on the line of command and the responsibilities of each person involved in case of emergency situation.

Equipment Plan:

Equipment plan includes clearly stipulating make and type of machinery, capacity of machinery, location of operations and field of operations. Emergency plan includes Emergency Preparedness Plan and the standing orders will be prepared and displayed at all conspicuous places.

Functions of the emergency consultative committee:

1. The team shall meet once in six months to discuss the possible or probable causes/ instances leading to any disaster that may occur in and around the mines.
2. The team shall assess the required resources to deal with the situation that may be identified as above.
3. The team leader shall lay down a detailed procedure or oral information to each member to follow in case of any impending or possible or actual disaster.
4. The team shall conduct mock drill once in a year to understand the practical problems that may arise while implementing the Emergency Preparedness Action Plan including the response time and take necessary steps to make the system effective.
5. The team shall make necessary recommendations/suggestions to the Management for identifying / monitoring/ dealing with any possible or probable disaster.

6. The minutes of the meeting of team shall be prepared including the probable cause of incident, response time and corrective and preventive actions required to be taken to avoid the reoccurrences of the same and kept as record.
7. The team may draw an Action Plan and modify the same from time to time based on changed circumstances.
8. The Emergency Preparedness team shall come into action immediately in case of any disaster by establishing the control room at an appropriate place nearer to the affected area.
9. The team shall record the actual performance/procedure followed/short comings while dealing with any actual disaster which will be discussed at various levels to strengthen the plan and approach.
10. Mines Manager shall inspect all the places where disaster occurred, along with Emergency Preparedness Team to give further instructions.
11. Mines Manager shall ensure that all affected places are safe to resume the normal works and then only shall give permission to start the operations.

1.3.1 EXECUTIONAL PROCEDURES FOR EMERGENCY PLAN:

The following procedural methodologies will be adopted for proper execution of emergency plan.

- On realizing anything serious occurrence happened anywhere in the mine, immediate information has to be passed on to the nearest available mining official and the mine management to take prompt action.
- On being informed about the emergency it will be verified for its correctness by the mining official who will telephone in particular to the Manager and supervisors of other parts/operations of the mine and managers of adjoining mine so that persons may be withdrawn.
- On receiving information of emergency intimation, it will be sent to the consultative committee, already formed by the mines manager/ Asst.manager-mining. The mines manager shall also inform about the disaster to the police, nearest office of mines safety, office of pollution control board, District Collector in charge of emergency plan of the district and other required statutory bodies of State and Central Government. Shift in-charge will ensure that all the materials and transport system to deal with emergency situation are made available at the site.

- First aid facilities and ambulance to be made ready for providing to the victims.
The Doctor should be immediately called upon.

The name and address of person responsible for management of disaster/emergency plan is given below:

Mr. Sivababu. L (Dy.G.M (mines)) / Mr. Kedarnath Reddy. R (General Manager-Mining)

Address: A.P.M.D.C Ltd., Mangampet Barytes Project

Ph.no. 9490167239 / 9490167235

However, the management shall take the statutory responsibility in controlling any disaster and take necessary remedial measures.

The address and phone numbers are as follows:

The Andhra Pradesh mineral development corporation Ltd,

D. No. 294/1D,

100 Feet New Auto Nagar Road,

Tadigadapa to Enikepadu,

Penamaluru Mandal,

Vijayawada - 521137, Krishna District.

In case of likelihood of any possible risks or disasters, pertaining to the mine workings such as inundation consequences, etc., spreading to outside peripheral areas, an “Off-site Emergency Plan” has to be properly planned and documented in consultation with Collector, YSR Kadapa District and other concerned Government Officials. In case of any unfortunate happening of an emergency in off-site areas, prompt execution of various action plans as laid down in the offsite Emergency plan has to be carried out with the help of the concerned Government officials and local people.