

RISK ASSESSMENT REPORT

FOR

“BLACK GRANITE MINING”

BY

M/s. TAMILNADU MINERALS LIMITED

AT

**SURVEY NUMBER 917 PART AND 921 PART
MAHIMANDALAM VILLAGE
KATPADI TALUK
VELLORE DISTRICT
TAMILNADU**

PREPARED BY

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RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

1.0 INTRODUCTION

TAMIN is operating Black Granite Quarry at survey number 917 part. and 921 part in Mahimandalam village, Katpadi Taluk, Vellore District, TamilNadu for the production capacity of 1003 m³ over an extent of 166.92 Ha. The entire mine lease of 166.92 Ha. is Govt. Poramboke land. The location map is shown in Figure 1.1 of EIA Report.

Mining and allied activities are associated with several potential hazards both to the employees and the public at large. A worker in a mine should be able to work under conditions that are adequately safe and healthy. At the same time the environmental conditions should be such as not to impair his working efficiency. The various safeguards to be taken to ensure the safety of the mine and that of employees are provided in the Mines Act, 1952.

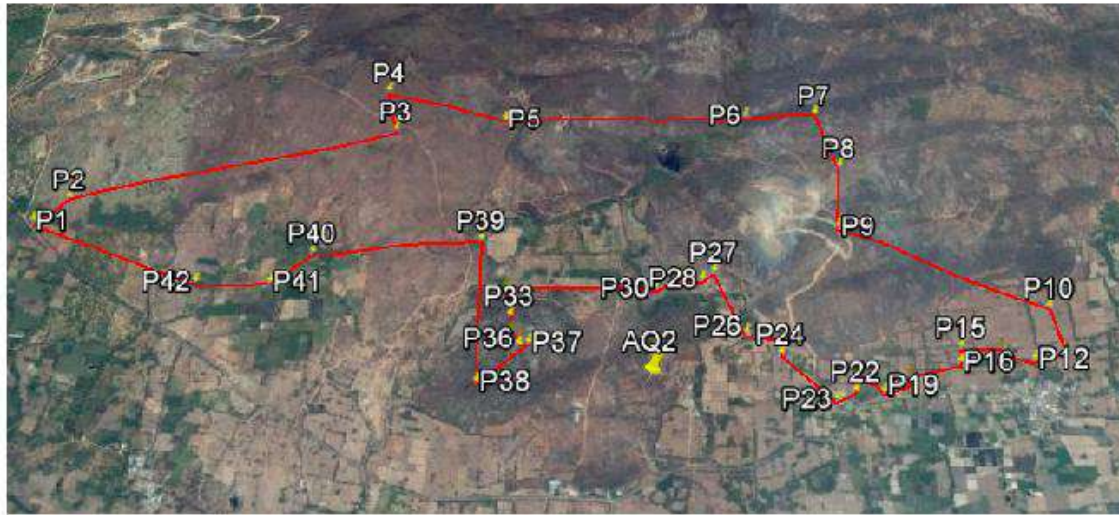
1.1 ENVIRONMENTAL SETTINGS

The project site is comes under Toposheet No – 57 O 4 and 8 and lies between the GPS coordinates of 13°4'53.86"N to 13° 5'27.78"N and 79°12'0.63"E to 79°13'54.09"E. The general location map and surface plan of the site is shown in Figure 2.1 and Figure 2.2 of EIA Report. Project site demarcated Google image and satellite view of the Study area is given in Figure 1.2 and Figure 3.22. The Environmental Setting of the study area is given in Table 1.1.

The primary Health Centre is located in Bommasamudram – 7.0 km in south west direction and Government hospital in ponnai at 6.0 km distance in north east direction.

Table 1.1 Environmental Settings

Sl.No.	Particulars	Details
Size of project		
1.	Mining Lease area	166.92 Ha. (Govt. Poramboke Land)
	Production capacity	1003 m ³ per annum
Project Location		
2.	Villages	Mahimandalam
3.	Taluk	Katpadi
4.	District	Vellore
5.	State	Tamil Nadu
6.	Latitude and Longitude	GPS coordinates lies between 13°4'53.86"N to 13°5'27.78"N and 79°12'0.63"E to 79°13'54.09"E.
7.	Toposheet No.	57 O 4 & 8
8.	Terrain	Undulating Terrain
Environmental Settings Details (with approx. aerial distance & direction from the mining lease boundary)		
9.	Nearest Highway	State Highway NH-124, distance 4.0 km (E).
10.	Nearest Railway Junction	Ramapuram Railway Station – 4.6 km (W)
11.	Nearest Town / City	Thiruvalem – 12.13 km (N)
12.	Nearest Village	Periya Bodinatham – 0.41 km (SW) Perumalkuppam – 0.84 km (W) Elayanellore – 2.64 km (S)
13.	Nearest Airport	Tirupati Airport- 70.0 Km (E)
14.	Nearest Water Bodies /River/Sea	Ponnai River - 5.5 Km (E)
15.	Archaeological Important Areas	None within 10 km radius
16.	National Parks/Wildlife Sanctuaries	None within 10 km radius
17.	Reserved Protected Forests	Mahimandalam RF - 2.25 Km –Aerial distance (S) Basavapalle RF – 4.75 Km –Aerial distance (SW) Basavapalle RF – 5.75 km –Aerial distance (NW) Chilapalle RF - 6.5 Km –Aerial distance (NW)
18.	Seismic zone	Zone III
19.	Defence Installations	None



S. No	Latitude	Longitude	S. No	Latitude	Longitude
1	13° 5'13.72"N	79°12'0.63"E	23	13° 4'53.86"N	79°13'29.15"E
2	13° 5'16.20"N	79°12'4.45"E	24	13° 4'58.77"N	79°13'23.46"E
3	13° 5'23.70"N	79°12'40.88"E	25	13° 5'0.44"N	79°13'24.03"E
4	13° 5'27.78"N	79°13'40.05"E	26	13° 5'1.02"N	79°13'19.86"E
5	13° 5'25.20"N	79°13'53.23"E	27	13° 5'7.79"N	79°13'16.62"E
6	13° 5'26.13"N	79°13'20.83"E	28	13° 5'6.93"N	79°13'15.26"E
7	13° 5'25.88"N	79°13'28.67"E	29	13° 5'7.42"N	79°13'13.16"E
8	13° 5'19.32"N	79°13'31.00"E	30	13° 5'5.75"N	79°13'10.03"E
9	13° 5'11.96"N	79°13'30.24"E	31	13° 5'6.02"N	79°12'53.71"E
10	13° 5'4.01"N	79°13'53.06"E	32	13° 5'3.18"N	79°12'54.79"E
11	13° 4'59.19"N	79°13'54.09"E	33	13° 5'2.53"N	79°12'54.39"E
12	13° 4'58.26"N	79°13'50.69"E	34	13° 5'0.72"N	79°12'54.59"E
13	13° 4'58.74"N	79°13'47.79"E	35	13° 4'59.97"N	79°12'55.70"E
14	13° 4'59.57"N	79°13'47.14"E	36	13° 4'58.96"N	79°12'55.46"E
15	13° 4'59.56"N	79°13'42.91"E	37	13° 4'59.21"N	79°12'56.51"E
16	13° 4'57.91"N	79°13'42.63"E	38	13° 4'55.23"N	79°12'51.09"E
17	13° 4'56.70"N	79°13'37.09"E	39	13° 5'11.54"N	79°12'50.93"E
18	13° 4'55.52"N	79°13'36.58"E	40	13° 5'10.07"N	79°12'32.27"E
20	13° 4'54.74"N	79°13'34.19"E	41	13° 5'6.59"N	79°12'27.97"E
21	13° 4'55.82"N	79°13'33.44"E	42	13° 5'6.68"N	79°12'19.69"E
22	13° 4'54.82"N	79°13'31.15"E			

Figure 1.1 Demarcated Project Site with GPS Coordinates

2.0 RISK ASSESSMENT

Risk Assessment is all about evaluation of potential of accidents and to take necessary steps to prevent it happening. The main objectives of preparing risk assessment in mining project include.

- To identify Hazard created due to mining operations and Evaluate Risk associated with theses hazards.
- Identification of Control Measures
- To prevent or reduce the incidence and severity of injury during mining operations
- To respond immediately and adequately in case of a serious accident

2.1 IDENTIFICATION OF HAZARDS

There are various factors, which can cause disaster in the mines. These hazards are as follows:

- Drilling
- Blasting
- Overburden handling
- Heavy Machinery

Risk involved in this Open cast Granite quarrying project are assessed as below,

- Land degradation
- Inundation of mine due to flood and heavy rain
- Risk due to working face, design parameters of Bench, Pit slope
- Types of Explosives and its handling, Storage and uses
- Accident due to transport of vehicles, loading
- Dust and gaseous emission due to drilling and Operation of Machineries
- Noise and Vibration

2.2 RISK ANALYSIS AND FINDINGS

1. All statutory appurtenances requirement with reference to safety and fire protection have been incorporated in the TAMIN.
2. Necessary preventive and protective measures are proposed for Cyclone, and earthquake.

2.3 MITIGATIVE MEASURES

The various possible hazards to be occurring due to mining operations and its control measures are given below in **Table 1.2**.

Table 2.2 Identification Hazards and Its Control Measures

S.No	Hazards	Control Measures
1.	Falling from the edge of a bench	Measures that can be taken to reduce the risk of falling off the edge of the bench is to provide suitable portable rail fencing which can be erected between the drill and the edge of the bench and direction by the supervisor for guidance of the driller. Proper Training to the driller.
2.	Inhalation of dust created during drilling operation	Use water during the drilling operations. Providing a ventilation system on drilling rig with dust filter to remove harmful dust
3.	Noise	Operators must be well trained and supervised. Use of sharp drilling bits, delivery of compressed air at optimal pressure. Providing PPE
4	Explosives	Safety can be ensured by planning for round of shots to ensure face properly surveyed, holes

		correctly drilled, direction logged, the weight of explosion for good fragmentation. Blast design, charge and fire around of explosives should be carried out by a trained person.
5	Rock Fall or slide	Regular examination of face must be done and remedial measures must be taken to make it safe if there is any doubt that a collapse could take place. Working should be advanced in a direction taken into account the geology such that face and quarry side remain stable.
6	Removal of Waste Top soil & O.B bench may slide due to its unconsolidated nature	Individual bench slope will be maintained at 60° Over all O.B bench slope angle will be maintained not more than 45° Adequate Bench width will be provided.
7	Loading and Transportation Dust Emission Rock Falling	Water Sprinkling The material transportation vehicle will be covered with tarpaulin to avoid falling. No overload. Proper Training. Controlled speed limit for transportation
8	Fire due to electricity and Oil	Commutator & electrical parts shall be cleaned frequently with the help of dry air blower. Proper maintenance of electrical cables and other wiring and periodic inspection of same. Proper maintenance and training.

2.4 RECOMMENDATIONS FOR IMPROVING SAFETY

The following measures are considered for enhancing the safety standards at site:-

1. The Environment team are trained on industrial hygiene and safety techniques.
2. The project falls under seismic zone-III according to the Indian Standard Seismic Zoning Map and is referred as Moderate Damage Risk Zone, and till date not major earthquakes have been reported.
3. The local exhaust ventilation is provided in the site.
4. The fugitive emission will be restricted during the mixing of aggregates. This will be restricted to the project site. It will be minimized by sprinkling water.
5. Every electrical equipment and lighting features should meet flame proof requirement.
6. Earth link may be connected to pump circuit to ensure start-up only after providing tank earth - connection.
7. Smoking and carrying smoking material are to be strictly prohibited.
8. Safety Procedures and Do's and Don'ts should be prepared and displayed in the site.

3.0 DISASTER MANAGEMENT PLAN












The mines safety and environment both has to be intact with Mines safety Regulations framed by the Expert committee of DGMS amended from time to time by way of circulars in addition to general conditions of MMR,1961. The conditions and procedures for safety of mines are laid down by them to ensure safety of persons and machineries and its working environment.

The overall function of the mining will be carried out under management control and direction workers by certified Mines Manager. All the mining operations including allied services such logistics etc should be carried out as per the timely guidelines and circulars of DGMS. However mining staff will be properly trained by giving refresher course.

The primary Health Centre is located in Bommasamudram – 7.0 km in south west direction and Government hospital in ponnai at 6.0 km distance in north east direction.

In order to handle disaster/emergency situations, an organization chart entrusting responsibility to various project personnel exists with their specific roles during emergency.

The possible composition of the management team shall be:

-  Mines Manager
-  Section In-charge
-  Site Controller
-  Incident Controller
-  Personnel/Administrative Manager
-  Communication Officer
-  Fire and Security Officer
-  Transport Coordinator
-  Medical Coordinator
-  Media Representatives
-  Communication Coordinator

3.1 TYPE AND CAUSES OF DISASTER

Natural calamities like

- i. Flood
- ii. Cyclone
- iii. Hurricane
- iv. Earthquake

3.2 DIFFERENT PHASES OF DISASTER

(a) Warning Phase:

Many disaster are preceded by some sort of warning, for example, with the aid of satellites and network of weather stations many meteorological disaster like cyclones and hurricanes can be predicted and actions can be taken (to eliminate/reduce their effect) to counter act them such as

- i. To inform local authorities in case there are possibilities of local people getting affected

(b) Impact Phase:

This is the period when the disaster actually strikes and very little can be done to lessen the effects of disaster. The period of impact may last for a few seconds (like fire, explosion) or may prolong for days (fire, water pollution etc)

- i. Actions to be taken by concerned persons as indicated in organisational structure
- ii. Public/Press coordinator to exchange information on number of injured, where about of affected people and details of hospitalisation.

(c) Rescue Phase:

The rescue phase starts immediately after the impact and continues until necessary measures are taken to rush help and combat with the situation.

(d) Relief Phase:

In this phase, apart from organisation and relief measures internally, depending on severity of the disaster, external help should also be summoned to provide relief measures like evacuation to a safe place and providing medical help, food, clothing etc. The evacuation plays a vital role in preventing injuries. Evacuation is planned taking into account the severity of emergency and wind directions. This phase will continue until all normalcies are restored.

(e) Rehabilitation phase:

This is the final and longest phase. It includes rebuilding of damaged property, estimating the damages, payment of compensation etc. Help from revenue /insurance authorities need to be obtained to assess the damage, quantum of compensation to be paid etc.

3.3 ON SITE EMERGENCY

This category consists of events likely to endanger human lives within the project site.

These events could be the emergencies of greater magnitude which:

- i. Are beyond the control of personnel on round the clock duty and beyond the facilities available in the Section/Department.
- ii. Require mobilization of additional resources from other section/Department to handle the emergency
- iii. Require help from Fire Services and other Government agencies.

3.4 OFF-SITE EMERGENCY

This category includes events likely to endanger human lives within the area and further common public and livestock of the neighborhood area due to emergencies of greater magnitude inside the site which are not possible to be controlled with the resources available within the site.

Outside resources from government agencies such as Civil Defence, Home Guards, Revenue Authorities, Transport, Police, Army, Air Force, Navy, Fire Services, Medical and Health Institutions etc, and other voluntary bodies may be required to control and contain the emergency.

3.5 MITIGATING MEASURES

- i. Activate evacuation if required
- ii. Liaise with External agencies like EB/Metro water etc for uninterrupted power and water supply.
- iii. Ensure adequate resources for fire fighting
- iv. Ensure all personnel are assembled at the proper designated location
- v. If evacuation is declared ensure headcount of people evacuated and coordinate with Welfare/Media/Transport coordinator for smooth boarding and drop of people to designated rallying post.
- vi. Extinguish the fire by isolating the source of fuel and / or by using water, steam or portable extinguishers which is available at the site by operating personal.
- vii. Declare Off-site Emergency when the effects of emergency threaten to enlarge.