EXECUTIVE SUMMARY

FOR OBTAINING ENVIRONMENTAL CLEARANCE

(Category - B1, under item 1 (a), as per EIA Notification 14th September' 2006 and its subsequent amendments till date)

FOR

"UMDUBA STONE QUARRY"

**Location: Village-Umduba, P.O Jorbil, P.S. Khanapara, Raid Marwet, District- Ri Bhoi,
State: Meghalaya**

Production Capacity: - 92,224 MTPA of ROM

Area: - 2.22 Ha; LOI issued dated 06.12.2018

Lease Validity: - 25 Years

Details of ToR	:	**Issued from SEIAA, Meghalaya**
Baseline data Generation	:	**December 2022 to February 2023 (Winter Season)**
Project Cost	:	**Rs. 18.50 Lacs**

PROMOTER

Shri Ken Momin

Umduba Killing, Raid Marwet,

District- Ri Bhoi, Meghalaya

ENVIRONMENTAL CONSULTANT

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NABET Accreditation: NABET/EIA/2023/ RA0192

(Rev.02)

March, 2023

EXECUTIVE SUMMARY

1.1 INTRODUCTION

The proposed project "Umduba Stone Quarry" is situated at Umduba, P.O. Jorbil, P.S Khanapara, Raid Marwet, Ri Bhoi District (Meghalaya). The total lease area of the project is 2.22 Ha. The mining activity will be carried out by open cast semi-mechanized method. The Letter of Intent has been sanctioned in favour of Shri Ken Momin vide letter no. KH/8/ML/Stone/69/5114 Dated 06.11.2018 by the Department of Forest and Environment, Office of the Divisional Forest Officer, East Khasi Hills & Ri Bhoi (T) Division, Shillong. The proposed mine is spread over an area of 2.22 ha. with mineable reserves of about 13,82,702 Tonnes to produce 92,224 MTPA of ROM.

1.1.1 LOCATION OF LEASE AREA

The proposed project "Umduba Stone Quarry" is situated at Umduba, P.O. Jorbil, P.S Khanapara, Raid Marwet, Ri Bhoi District (Meghalaya).

1.1.2 DETAIL OF MINING LEASE

S. No.	Particulars	Details
1.	Name of Project	Umduba Stone Quarry
2.	Location	Umduba, P.O. Jorbil, P.S Khanapara, Raid Marwet, Ri Bhoi District (Meghalaya)
3.	Lease Area	2.22 Ha.
4.	Land Type	Khatedari Land (Private)
5.	Latitude & Longitude	26°03'42.35"N to 26°03'50.01"N and 91°49'36.10"E to 91°49'44.03" E
6.	Seismic Zone	Zone – V

1.2 PROJECT DESCRIPTION

The Letter of Intent has been sanctioned in favour of Shri Ken Momin vide letter no. KH/8/ML/Stone/69/5114 Dated 06.11.2018 by the Department of Forest and Environment, Office of the Divisional Forest Officer, East Khasi Hills & Ri Bhoi (T)

Division, Shillong. The proposed mine is spread over an area of 2.22 ha. with mineable reserves of about 13,82,702 Tonnes to produce 92,224 MTPA. The proposed mining operations will be carried out by open cast semi - mechanized method.

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1.2.1 GEOLOGY

1.2.1.1 Local Geology

The succession of rocks in the lease area is as given below:-

Table 1.1: Local Geology

Age	Group	Rock Type
Recent		Weathered gneiss and reddish soil
Archaean and late-Proterozoic	Assam-Meghalaya Gneissic Complex	Biotite-gneiss, migmatite, with basic enclaves

1.2.1.2 Physiography

The topography of the lease area is hilly terrain. Highest elevation is 400 mRL and lowest is 210 mRL.

1.2.2 GEOLOGICAL AND MINEABLE RESERVES

A) Total Mineral Reserves	Total Reserve (Tonnes)
Mineable Proved Reserves	1128753
Mineable Probable Reserves	253949
Total Mineable Reserves	**13,82,702**
B) Total Remaining Resources	
Feasibility Mineral Resources	--
Pre-Feasible Mineral Resources	3,25,799
Inferred Mineral Resources	--

1.2.3 MINING

The deposit in the proposed site is massive and compact in nature so it is proposed to carryout mining by Open cast Semi-Mechanized mining method. The salient features of mode of working as per approved Mining Plan with PMCP are:-

➢ Jack hammer will be deployed for drilling of shot holes ranging from 30 to 34 mm diameter and breaking of boulder stone at

➢ Breaking of Boulder stone of required size will be done manually.

➢ Muffle blasting will be adopted as precautionary measure to contain fly rocks.

➢ The benching system 6m x 6m will be practiced in the area in order to comply with the provisions of Metalliferous Mines Regulation, 1961.

➢ The bench slope angle for stabilization of the benches will be maintained at 45°.

1.2.4 PRODUCTION DETAILS

The year wise development of mines for five year will progress as per the table below:-

Table 1.2: Production Details

Year	ROM (Tonnes)	BOULDER STONE (Tonnes)	SOIL (Tonnes)
1st Year	94,183	92,098	2,085
2nd Year	93,965	92,198	1,767
3rd Year	93,049	92,224	8,25
4th Year	92,215	92,215	-
5th Year	91,980	91,980	-
Total	**4,65,392**	**4,60,715**	**4,677**

1.2.5 LAND USE PATTERN

Land use plan of the mine lease area to encompass pre-operational, operational and post–operational phases is given below:-

Table 1.3: Land Use Pattern

S. No.	Land Use Category	Pre-Operational (Ha.)	Operational (Ha.)	Post-Operational (Ha.)
1	Dump	00	0.10	00
2	Pit & Quarry Area	00	0.88	00
	Excavation (Voids Only)	00	00	00
	Reclamation (Backfilled)	00	00	1.49

3	Road	00	0.02	00
4	Infrastructure	00	00	00
5	Afforestation	00	0.24	0.73
6	Mineral Storage	00	00	00
7	Sub – grade stack yard	00	00	00
8	Undisturbed Area	2.22	0.98	00
	Total	**2.22**	**2.22**	**2.22**

1.3   DESCRIPTION OF THE ENVIRONMENT

For monitoring the environmental parameters like meteorology, air, water, soil and noise quality, the monitoring stations have been established at eight locations in the study area. The baseline data has been collected in the summer season (March 2022 to May 2022). The detail of the sampling locations is given in below:-

Table 1.4: Sampling Location

Sampling Location	Distance (Km)	Direction	Components
Mine Site	--	--	Air, Water, Noise, Soil
Tamulikuchi	4.8	ENE	Air, Water, Noise, Soil
Byrnihat	1.2	ESE	Air, Water, Noise, Soil
Morang Dala	4.5	SE	Air, Water, Noise, Soil
Imsohma	2.7	SSW	Air, Water, Noise, Soil
Malkhull	2.6	WNW	Air, Water, Noise, Soil
Khanapara	1.5	NNW	Air, Water, Noise, Soil
Khaddum	0.95	North	Air, Water, Noise, Soil

1.3.1 LAND ENVIRONMENT

1.3.1.1 Soil Quality

Soil samples were collected at eight representative sampling locations. The soil analysis results are given below:-

pH	:	7.12 to 7.65
Soil Conductivity	:	364 to 427 µmhos/cm
Total Nitrogen (N)	:	161 kg/ha. to 360 kg/ha.
Phosphorus as P	:	56 kg/ha to 59 kg/ha.
Potassium as K	:	236.00-248.50 (mg/kg)

1.3.2 WATER ENVIRONMENT

Eight ground water samples have been considered in the study area. The analysis results are presented below:-

Table 1.6: Water Quality Status

S.No.	Parameter	Units	Requirement (Desirable Limits).	Permissible Limits in the Absence of Alternate Source.	Mine Site	Tamuli kuchi	Byrni hat	Morangdala	Imsohma	Maikhuli	Khana para	Khad dum
Organoleptic & Physical Parameters												
1.	Colour	Hazen Unit	5	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2.	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3.	Taste	-	Agreeable	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4.	Turbidity	NTU	1	5	<1.0	<1.0	<1	<1	<1.0	<1.0	<1	<1
5.	pH value	-	6.5-8.5	-	7.54	7.16	7.35	6.98	7.48	7.18	6.93	7.22
6	Total Dissolve Solid (TDS)	mg/l	500	2000	389.2	321.0	402.0	241.9	325.0	380.0	260.0	319.0
General Properties												
7	Aluminum (as Al)	mg/l	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	Total Ammonia	mg/l	0.5	No Relaxation	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
9	Anionic surface Detergents(as MBAS)	mg/l	0.2	1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
10	Barium (as Ba)	mg/l	0.7	No Relaxation	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
11	Boron (as B)	mg/l	0.5	2.4	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
12	Calcium(as Ca)	mg/l	75	200	56.95	56.95	54.32	61.47	65.27	56.82	52.39	58.20

13	Chloramines (as Cl2)	mg/l	4.0	No Relaxation	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
14	Chloride (as Cl)	mg/l	250	1000	15.73	14.62	14.69	13.95	16.26	14.39	13.82	16.84
15	Copper (as Cu)	mg/l	0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
16	Fluoride(as F)	mg/l	1.0	1.5	0.38	0.31	0.28	0.32	0.29	0.30	0.28	0.33
17	Free Residual Chlorine	mg/l	0.2	1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron (as Fe)	mg/l	1.0	No Relaxation	0.129	0.124	0.132	0.129	0.128	0.121	0.120	0.129
19	Magnesium (as mg)	mg/l	30	100	3.84	3.79	4.10	4.18	3.92	4.06	3.65	4.08
20	Manganese (as Mn)	mg/l	0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Mineral Oil	mg/l	0.5	No Relaxation	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
22	Nitrate (as NO_3)	mg/l	45	No Relaxation	0.32	0.31	0.30	0.32	0.33	0.31	0.30	0.32
23	Selenium (as Se)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Silver (as Ag)	mg/l	0.1	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
25	Sulphate (as SO_4)	mg/l	200	400	26.75	24.65	26.82	26.83	25.81	23.92	22.87	28.14
26	Sulphide(as H_2S)	mg/l	0.05	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
27	Alkalinity(as Ca	mg/l	200	600	201.0	194.0	187.0	187.0	189.0	176.0	179.0	196.0

	CO₃)										
28	Total Hardness (as CaCO₃)	mg/l	200	600	174.0	167.0	164.0	165.0	173.0	161.0	160.0	172.0
29	Zinc (as Zn)	mg/l	5	15	0.162	0.159	0.151	0.148	0.162	0.154	0.152	0.161
Parameters Concerning Toxic Substances											
30	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
31	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Phenol	mg/l	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
33	Lead (as Pb)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
34	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
35	Molybdenum (Mo)	mg/l	0.07	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
36	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
37	Poly nuclear Aromatic	mg/l	0.0001	No Relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
38	Poly chlorinated biphenyl	mg/l	0.0005	No Relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Microbiological Parameter											
39	Escherichia coli	Absent/100ml			Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
40	Coliform Bacteria	Absent/100ml			Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

1.3.3 AIR ENVIRONMENT

To assess the baseline status of the air quality in the study area systematic ambient air quality monitoring has been carried out for criteria pollutants (PM_{10}, $PM_{2.5}$, NO_X, SO_2 and CO) at eight representative ambient air quality monitoring stations.

1.3.3.1 Ambient Air Quality

Ambient air quality monitoring has been carried out with a frequency of two days a week at eight locations covering one complete season i.e. December 2022 to February 2023. The summary of these results for all the locations is given below. These are compared with the standards prescribed by Central Pollution Control Board (CPCB) for rural and residential zone.

Table 1.7: Ambient Air Quality Status

S. No.	Sampling Location		Parameters				
			PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	CO (mg/m^3)
1.	Mine Site	Min	40.29	13.68	3.93	5.25	0.47
		Max	57.14	20.92	6.18	8.29	0.59
		Avg.	44.27	16.33	5.34	6.80	0.53
		98th% ile	55.35	20.57	6.11	8.26	0.59
2.	Tamulikuchi	Min	40.26	15.43	5.37	6.55	0.32
		Max	54.36	22.43	7.67	8.69	0.92
		Avg.	45.65	17.76	6.10	7.45	0.57
		98th% ile	53.38	22.06	7.64	8.64	0.90
3.	Byrnihat	Min	32.58	13.79	4.8	6.14	0.45
		Max	50.75	22.4	6.5	8.86	0.55
		Avg.	41.31	17.29	5.63	7.45	0.51
		98th% ile	50.18	22.37	6.41	8.69	0.55
4.	Morang Dala	Min	36.02	13.76	4.33	7.09	0.46
		Max	49.15	20.84	8.44	12.64	0.79
		Avg.	45.87	18.12	7.22	9.58	0.62
		98th% ile	48.92	20.40	8.43	12.64	0.78
5.	Imsohma	Min	32.69	22.61	4.24	8.43	0.47
		Max	48.69	27.54	8.14	10.46	0.82
		Avg.	45.76	24.44	6.00	9.43	0.58
		98th% ile	48.58	27.17	7.72	10.46	0.81
6.	Malkhull	Min	35.41	14.32	5.35	8.54	0.47
		Max	45.02	21.38	7.89	10.98	0.85

		Avg.	40.98	16.62	6.89	9.95	0.62
		98th% ile	44.61	21.22	7.89	10.98	0.82
7.	Khanapara	Min	40.92	16.72	5.03	8.84	0.48
		Max	53.4	23.84	7.54	10.9	0.92
		Avg.	44.97	18.79	6.18	9.80	0.70
		98th% ile	51.48	23.38	7.51	10.89	0.89
8.	Khaddum	Min	38.5	11.5	3.93	5.25	0.47
		Max	46.7	20.92	6.18	8.29	0.59
		Avg.	42.52	15.88	5.25	6.80	0.53
		98th% ile	46.26	20.54	6.11	8.26	0.59
NAAQ STANDARDS			**100**	**60**	**80**	**80**	**2**

1.3.4 NOISE ENVIRONMENT

The noise monitoring has been conducted for determination of noise levels at eight locations in the study area. The noise levels at each location were recorded for 24 hrs. The results obtained were compared with the national standards and were found to be within the standards. The collected data are:-

Table 1.8: Ambient Noise Level Status

Location	Date of Sampling	Day Time (6.00 AM to 10.0PM)	Night Time (10.00 PM to 6.00 AM)
Mine Site	08.12.2022	56.6	35.5
Tamulikuchi	24.12.2022	51.4	38.1
Byrnihat	05.12.2022	52.6	40.5
Morang Dala	04.01.2023	50.0	35.6
Imsohma	18.01.2023	53.6	40.3
Maikhuli	23.01.2023	54.8	42.0
Khanapara	01.02.2023	52.5	38.5
Khaddum	06.02.2023	54.1	37.8
Standards			
Category of Area/ Zone		Day Time	Night Time
Industrial Area		75	70
Commercial Area		65	55
Residential Area		55	45
Silence Zone		50	40

1.3.5 SOCIO-ECONOMIC ENVIRONMENT

The study area includes the 58 Villages Umduba, P.O. Jorbil, P.S. Khanapara, Raid Marwet, District- Ri- Bhoi, State- Meghalaya within 10 km of area from mine periphery.

Table 1.9: Demography Profile of the Study Area

S. No.	Particulars		Details
1.	No. of Villages		58
2.	Total Population		31183
	a.	Male	15909
	b.	Female	15274
3.	No. of Households		6369
4.	No. of Literates		19611
	a.	Male	10648
	b.	Female	8963
5.	Main Workers		10241
	a.	Male	7362
	b.	Female	2879
6.	Marginal Workers		2622
	a.	Male	1117
	b.	Female	1505
7.	Non-workers		18320
	a.	Male	7430
	b.	Female	10890

(Source: Census, 2011)

1.3.6 BIOLOGICAL ENVIRONMENT

Buffer Zone
Flora
Climber – 19 Specie
Herb – 40 Species
Shrubs - 70 Species
Tree – 74 Species
Fauna
Amphibian – 17 Species
Fish - 16 Species
Avifauna – 92 Species

Butterflies – 28 Species
Mammals – 27 Species

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The summary of anticipated adverse environmental impacts due to the existing mine and mitigation measures are given below:-

Impact	Mitigation Measures
Land Environment	
Land will be degraded due to mining and dumping of waste	➢ The total excavated area 1.49 ha. which will be backfilled and reclaimed and rehabilitated by plantation. The extent of impact will however; be confined within lease area only.
Water Environment	
Discharge of effluents water from the mine. Intersection of ground water table during mining operations.	There will be no discharge of effluent from the mine. As per the approved Mining Plan along with PMCP, ultimate pit level (290 mRL) will be above the ground water table and hence it will not be intersected.
Air Environment	
➢ Dust will be generated mainly during excavation, loading & unloading activities. ➢ Gaseous pollutants will by generated mostly by the traffic.	➢ It will be ensured that all the vehicles plying in the working zone are properly tuned and maintained to keep emissions within the permissible limits. ➢ At loading & unloading points and transportation routes, arrangement for water sprinkling will be made to minimize dust generation. ➢ In order to predict changes in the air quality, AERMOD version 8.8.0 model was used. The maximum ground level concentrations of particulate matter PM_{10} & $PM_{2.5}$, NOx, CO from the different mining activities for the study period (Winter Season) were observed to be 4.03897 µg/m^3 & 3.00038 µg/m^3, 0.04616 µg/m^3, 0.000013 mg/m^3 respectively. ➢ The resultant will remain within the National Ambient Air Quality Standards for industrial/ residential areas.
Noise Environment	

➢ Noise due to mining activities. ➢ Noise due to vehicular movement.	➢ The noise levels from all these sources are periodical and restricted to particular operation. ➢ The noise measurement data indicated that present noise levels in the study area is within the permissible limits of National Ambient Noise Quality Standards. ➢ Thus, due to natural attenuation effects by proper green belt/ maintenance of machines etc., the impact of noise levels will be minimal.
Socio-Economic Environment	
➢ Employment generation ➢ Health impacts ➢ Education Facilities	➢ The mining activity puts negligible change in the socio economic profile. ➢ No displacement (0) is proposed due to proposed mine. ➢ Approx. 21 local workers will get employment opportunities along with periodical training to generate local skills. ➢ New patterns of indirect employment/ income will generate. ➢ Regular health Check up camp. ➢ Assistance to schools and scholarship to children will be provided.
Biological Environment	
➢ Impact on biodiversity ➢ Impact on threatened species	➢ The mining activity will have insignificant effect on the existing flora and fauna. The purpose of the project itself is to save the flora around the project area. ➢ The existing vegetation within the mining area includes trees and shrubs vegetation. They will not be disturbed due to the mining activity. So, the impact on the vegetation is very less. ➢ The transportation of waste may create dust pollution which may create loss of biodiversity of the area. ➢ Dust in atmosphere, contributed by mining and associated activities, when deposited on the leaves of the plants in the surrounding areas may retard their growth. ➢ The growth of vegetation in and around the complexes. Noise and vibrations due to blasting and operation of the machines drive away the wild animals and birds from the nearby nests. ➢ The cluster area and its buffer zone are devoid of any eco sensitive

| | area. So the impact on the biodiversity and wild life is minimal.
| | ➢ Green belt will be developed along the individual lease boundary which will act as a pollution barrier for the biological environment.
| | ➢ There is the proposal for plantation along the haul road of individual lease and also along the connecting road.
| | ➢ The blasting, drilling and transportation will be carried out during the day time only minimizing the impact on the wild fauna movement.
| | ➢ All the necessary pollution control measures will be undertaken by the lessee to minimize the impact on the surrounding environment.

1.5 ENVIRONMENTAL MONITORING PROGRAMME

1.5.1 AIR

Air quality monitoring will be carried out as per norms of SPCB and CPCB.

1.5.2 WATER

Regular monitoring of ground water quality will be carried out at suitable locations. Water samples will be collected four times in a year i.e. Pre - Monsoon, Monsoon, Post - Monsoon and Winter.

1.5.3 NOISE

Noise level will be recorded periodically at mine site near operating machines during day and night time.

1.5.4 HEALTH AND SANITATION

Periodical medical checkup of workers is being done and medical facility provided. Toilets and urinals will be provided near the mine site. Drinking water will be made available to the workers.

1.6 ADDITIONAL STUDIES

1.6.1 PUBLIC HEARING

Public hearing will be conducted as per the guidelines of EIA Notification 14th September, 2006 and its subsequent amendments.

1.6.2 RISK ASSESSMENT & MANAGEMENT

Risk analysis is the systematic study of uncertainties and risks encountered in various areas. Risk analysts seek to identify the risks involved in mining operations, to understand how and when they arise, and estimate the impact (financial or otherwise) of adverse outcomes. It also defines and analyzes the dangers to individuals, businesses and government agencies posed by potential natural and human-caused adverse events.

However, there are various factors, which can create unsafe working conditions/ hazards in mining of Stone (Minor minerals). The following types of hazards are identified during the Stone mining operations:-

1. Accident during mineral loading, transportation and dumping

2. Accident due to vehicular movement

3. Inundation/ Flooding

Following procedure will be followed for effective management of any disaster in the mine.

Step 1: Identification of Disaster risk.

Step 2: Identification of persons at risk

Step 3: Removal of Hazard

Step 4: Evaluation of the risk

Step 5: Control measures to be taken

Step 6: Maintain Assessment records

Step 7: Review

1.7 PROJECT BENEFITS

The demand of Stone has been rising in the state as a result of rising in industrial activities and development of the existing project aims to fulfill the supply of Stone. The capacity of mine is 92,224 MTPA aiming to fill the demand – supply gap.

This stone mining will generate direct and indirect employment. Economy of the area will get a boost and there will be overall growth of the region in terms of education, health, training, awareness, transport, automobile, industry, and infrastructure. The standard of living accordingly will also get an upliftment on the positive side. Plantation will be carried out as social forestry programme in villages, school and the areas allocated by the Panchayat/ State authorities to improve environment of its surrounding area.

1.8   ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan (EMP) aims at the reservation of ecological system by considering in – built pollution abatement facilities at the mine site. Some of the major criteria governing the environmental measures will be adopted.

1.8.1 LAND USE MANAGEMENT

The following reclamation plan will be adopted in this mine.

1) At the end of life of mine, total excavated area will be of 1.49 ha.
2) Plantation is proposed over an area of 2.22 ha. out of which plantation will be done on backfilled area (1.49 ha.) and un-worked area (0.73 ha.).

1.8.2 WATER POLLUTION MANAGEMENT

Some of the control measures adopted for controlling water pollution are as follows:-

➢ Based on results from monitoring corrective regulatory measures will be taken.
➢ Measurement of water level fluctuations to assess impact of mining activity on the water table depletion in close proximity of dug wells and bore wells.
➢ Regular monitoring and analysis of water samples at strategic locations will be carried out to monitor the water quality.
➢ Domestic waste water will be channelized into septic tank followed by soak pit.

1.8.3 AIR POLLUTION MANAGEMENT

Following mitigation measures are envisaged:-

➢ The speed of the vehicles will be maintained uniform.
➢ Regular pollution checks and certification of vehicles will be done.
➢ Limited number of mine-related vehicle will be maintained on the public roadways to reduce the traffic to minimize impacts on local people.
➢ The loaded vehicles will be covered with tarpaulin.
➢ Over loading will be avoided and free board will be left in the loaded trucks to prevent spillage.
➢ The roads will be maintained.
➢ Regular cleaning will be done to reduce the chances of road dust to become airborne.
➢ Water sprinkling will be done on a fixed stretch of paved road.

> ➤ Natural barriers will be developed along the roadside to control the dispersion of dust particles.

> ➤ Speed breakers will be constructed to restrict the speed of transporting vehicles. However, limiting of vehicular speed will be adopted.

> ➤ Regular monitoring and analysis will be carried out through collection of air samples from strategic monitoring sites. If the parameters go beyond the permissible tolerance limits, corrective regulation measure will be taken.

1.8.4 NOISE POLLUTION MANAGEMENT

The following control measures are to be undertaken to bring down the noise levels:-

> ➤ Noisy activities will be scheduled at normal working hours (daytime hours) to the extent possible when the environment is least sensitive to noise impact.

> ➤ Regular inspection and maintenance of vehicles and equipment will be performed to ensure efficiency and worn parts will be replaced.

> ➤ The vehicles will be maintained in good condition and overloading will not be done.

> ➤ Speed limits will be enforced in relation to road conditions and on-route communities.

> ➤ Noise monitoring will be conducted on a regular basis to determine compliance with noise criteria.

> ➤ Personal Protective Equipments i.e., earmuffs and earplugs will be provided to workers, working in high noise areas.

> ➤ Periodical medical checkup will be organized for all workers to check any noise related health problems.

> ➤ Operational noise level status will be displayed on machines to identify the extent of noise level and to control the exposure times at which worker are exposed to higher noise levels.

1.8.5 OCCUPATIONAL HEALTH AND SAFETY

> ➤ To avoid any adverse effect on the health of the workers due to dust, noise etc. extensive measures has to be adapted related to safety aspect.

> ➤ Regular maintenance and testing all the tools & equipments as per manufacturer's guidelines.

> ➤ Provision of personal protective equipment to the workers working in the mine.

➤ Periodical Medical Examination of all workers by medical specialists will be conducted.

➤ Awareness program will be organized for workers.

1.8.6 SOCIO-ECONOMIC MANAGEMENT

➤ Environmental Officer will be responsible to take care the performance of mine on environmental issues.

➤ Approx. 21 local workers will be directly and about 10-15 will be indirectly employed.

➤ Employment opportunities along with periodical training to generate local skills.

➤ Local employment will be ensured. On the job training to local people will be given and periodically upgraded.

➤ Regular health camps will be carried out.

1.8.7 BIOLOGICAL MANAGEMENT

No adverse impact & no genetic diversity loss are anticipated from the mining activity. However due care & extensive plantation activity will be undertaken to reduce impact from the activity.

1.9 CONCLUSION

EIA study was performed as per the approved ToR. Various environmental attributes were studied relating with aspects of mining activities. The related impacts were identified and evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and accordingly fund was allocated. The EMP has been dynamic, flexible and subject to periodic review.

The project will increase the revenue of the State Govt. as well as it will help in the social upliftment of the local people. The greenbelt development programme will help in increasing the green cover in the nearby areas. Thus, the project is not likely to affect the environment or adjacent ecosystem adversely. The Management will be responsible for the project review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.

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