

# DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT & ENVIRONMENT MANAGEMENT PLAN of

**Kalkasa- Baldeopur cluster Limestone (Low grade) Quarry at  
Village: Kalkasa – Baldeopur, Tehsil: Khairagarh District: Rajnandgaon,  
State: Chhattisgarh  
Total Area 10.803 ha**

## Executive Summary English

### List of Applicant

S. No.	Name	Location		Mineral	Area (in ha.)	New Proposal No.
		Village	Tehsil			
1	Mahavir Prashant Bohra {Name Changed - Bol Bam Minerals Shankar Gyanchandani}	Kalkasa	Khairagarh	Lime Stone	1.295	SIA/CG/MIN/43985/2017
2	Meena Ranglani	Kalkasa	Khairagarh	Lime Stone	1.498	SIA/CG/MIN/44498/2017
3	Paresh Kumar	Kalkasa	Khairagarh	Lime Stone	1.214	SIA/CG/MIN/40346/2019
4	Aruna Jogewar	Kalkasa	Khairagarh	Lime Stone	0.850	SIA/CG/MIN/127754/2019
5	Shrichand Chachra	Kalkasa	Khairagarh	Lime Stone	0.647	SIA/CG/MIN/163088/2020
6	Suman Singh	Kalkasa	Khairagarh	Lime Stone	0.566	SIA/CG/MIN/151051/2020
7	Suman Singh	Baldeopur	Khairagarh	Lime Stone	0.850	SIA/CG/MIN/151413/2020
8	Bhaoram Chakradhari	Baldeopur	Khairagarh	Lime Stone	1.295	SIA/CG/MIN/43954/2019
9	Rakhi Turhate	Baldeopur	Khairagarh	Lime Stone	1.112	SIA/CG/MIN/42870/2019
10	M/s Kavita Stone	Baldeopur	Khairagarh	Lime Stone	0.667	SIA/CG/MIN/43871/2019
11	Khairagarh Minerals (M N Patra)	Baldeopur	Khairagarh	Lime Stone	0.809	SIA/CG/MIN/152124/2020

## Indian Mine Planner & Consultant

NABET/EIA/1821/IA0037

ACCREDITED BY NABET UNDER "A" CATEGORY FOR OPEN CAST MINES

Corp. Office: GE-61, Rajdanga Main, Road, Behind Gateway Hotel, EM Bye Pass, Kolkata

## **Executive Summary**

### **Introduction**

Chhattisgarh is rich in mineral resources, which include iron ore, granite, coal, lime stone, bauxite and quartz.

Environmental Impact Assessment (EIA) study is a process to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decision makers in taking appropriate decisions for projects. EIA systematically examines both beneficial and adverse consequences of the project and ensure that these impacts are taken into account during the project designing.

This report discusses the management plan for mitigation/abatement of adverse environmental impacts and enhancement of beneficial impacts due to mining. This report has been designed within the framework of various legislative and regulatory requirements on environmental and socioeconomic aspects.

All the 11 mines have been submitted individually and presented to the State Expert Appraisal Committee (SEAC) Chhattisgarh on different meetings. With reference to the technical presentation before SEAC Chhattisgarh; the committee recommended to prepare the combined EIA report for the cluster area under Category B1 as per the latest amendments to the EIA Notification 2006. The lease has been granted to the proponents for a period of 10 and 30 years individually by Mineral Resource Department, Government of Madhya Pradesh & Chhattisgarh. Now, As per the 8A(3) of MMDR Amendment Ordinance, 2015, dated 12- 01-2015, "All mining leases granted before the commencement of the Mines and Minerals (Development and Regulation) Amendment Ordinance, 2015 shall be deemed to have been granted for a period of fifty years".

The Environmental Impact Assessment documentation has been prepared in terms of EIA notification of the MoEF&CC dated 14.09.2006, as amended so far and the EIA Guideline Manual for Mining of Minerals (Feb, 2010) of MoEF&CC, Govt. of India. The present study is for seeking environmental clearance for mining in the area of Kalkasa & Baldeopur villages for limestone mining and the above said all the lease area falls under "Category B1" which requires environment clearance from the State Environment Impact Assessment Authority (SEIAA). The Project Proponents as part of the compliance from SEIAA has appointed Enviba Environmental Services, Raipur as Environmental Consultants who are accredited by National Accreditation Board for Education and Training (NABET), Quality Council of India (QCI), New Delhi.

### **Project Description**

The study project of all the limestone mines lies in the Kalkasa and Baldeopur villages, Khairagarh Tehsil, Rajnandgaon District in Chhattisgarh. The lease deed of all the existing 11 mines is

**Draft EIA/EMP for Proposed Cluster of Eleven (11) Limestone Mine, Lease area: 10.803 Ha, located in Village Kalkasa & Baldeopur, Tehsil- Khairagarh, District- Rajnandgaon, State-Chhattisgarh**

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executed for mining of limestone. The mining plan of all the lease area has been approved by Directorate of Geology & Mining, Raipur.

The Environmental Impact Assessment documentation has been prepared in terms of EIA notification of the MoEF & CC dated 14.09.2006 (Further amended), EIA Guideline Manual for Mining of Minerals (Feb, 2010) of MoEF & CC, Govt. of India and ToR issued from SEAC Chhattisgarh for the projects falling under Category "B1" as per EIA Notification.

The target production capacity of the all the mines ranges from 5000 TPA to 28000 TPA by open cast method. Mining lease granted for maximum period of 30 Years.

#### **Location Details**

1.	Village	Kalkasa and Baldeopur
2.	Tehsil	Khairagarh
3.	District	Rajnandgaon
4.	State	Chhattisgarh
5.	Toposheet No.	64 C/15
6.	Latitude	N 21° 20' 54.22" to N 21° 21' 32.61"
7.	Longitude	E 80° 57' 20.51" to E 80° 57' 24.89"

#### **Land Use Pattern of the Study Area**

<b>Sr. No.</b>	<b>Particular</b>	<b>Area (ha.)</b>	<b>Percentage (%)</b>
1	Build up	999.19	2.91
2	Water Body	548.45	1.60
3	River	278.03	0.81
4	Open Scrub	1251.11	3.64
5	Forest	161.70	0.47
6	Agriculture Land	31133.48	90.58
	<b>Total</b>	<b>34371.97</b>	<b>100</b>

#### **Water Requirement (KLD)**

Total water requirement for all the mines located in cluster will be 86.17 KLD, which will be met from mine water and bore well. **The range of water require for individual mine will be from 5-8 KLD.**

#### **Manpower Requirement**

Total 163 No. of Manpower requirement is noticed in 11 existing limestone mine of cluster located in kalkasa and Baldeopur villages of Khairagarh district of Rajnandgaon village. Most of the employment will be given to local people as per their knowledge and technical skills.

### Power Requirement

The electric power requirement for mine facilities will be received from Chhattisgarh State Electricity Board, as is the case in existing mine.

### Extent of Mechanisation

The list of machines as existing and additional to be used is as follows.

### List of Machinery

Sr. No.	Name of Owner	Jack Hammer Drill	Excavator/ Breaker	Tippers/ Tractors	Multipurpose/ Pickup vehicle	Water Taanker
1	Mahavir Prashant Bohra {Name Changed - Bol Bam Minerals Shankar Gyanchandani}	1	1	2	1	1 (8KL)
2	Meena Ranglani	1	1	2	1	1 (8 KL)
3	Paresh Kumar	1	1	2	1	1 (4 KL)
4	Aruna Jogewar	1	1	2	1	1 (4 KL)
5	Shrichand Chachra	1	0	2	1	1 (8 KL)
6	Suman Singh-Kalkasa	1	1	2	1	1 (4 KL)
7	Suman Singh-Baldeopur	1	1	2	1	1 (4 KL)
8	Bhaoram Chakradhari	1	1	2	1	1 (8 KL)
9	Rakhi Turhate	1	1	2	1	1 (8 KL)
10	M/s Kavita Stone	1	0	2	1	1 (8 KL)
11	Khairagarh Minerals (M N Patra)	1	1	2	1	1 (8 KL)

### Mineable Reserves & Anticipated Life of Mine as per Approved Scheme of Mining

S. No.	Name of the Mine	Total Geological Reserve (MT)	Total Blocked Reserve (MT)	Total Mineable Reserve (MT)	Average Production Capacity (in tonnes)	Life of the Mine (Yrs)
1	Mahavir Prashant Bohra {Name Changed - Bol Bam Minerals}	259000	55300	139930	25000	5.60 ~ 6

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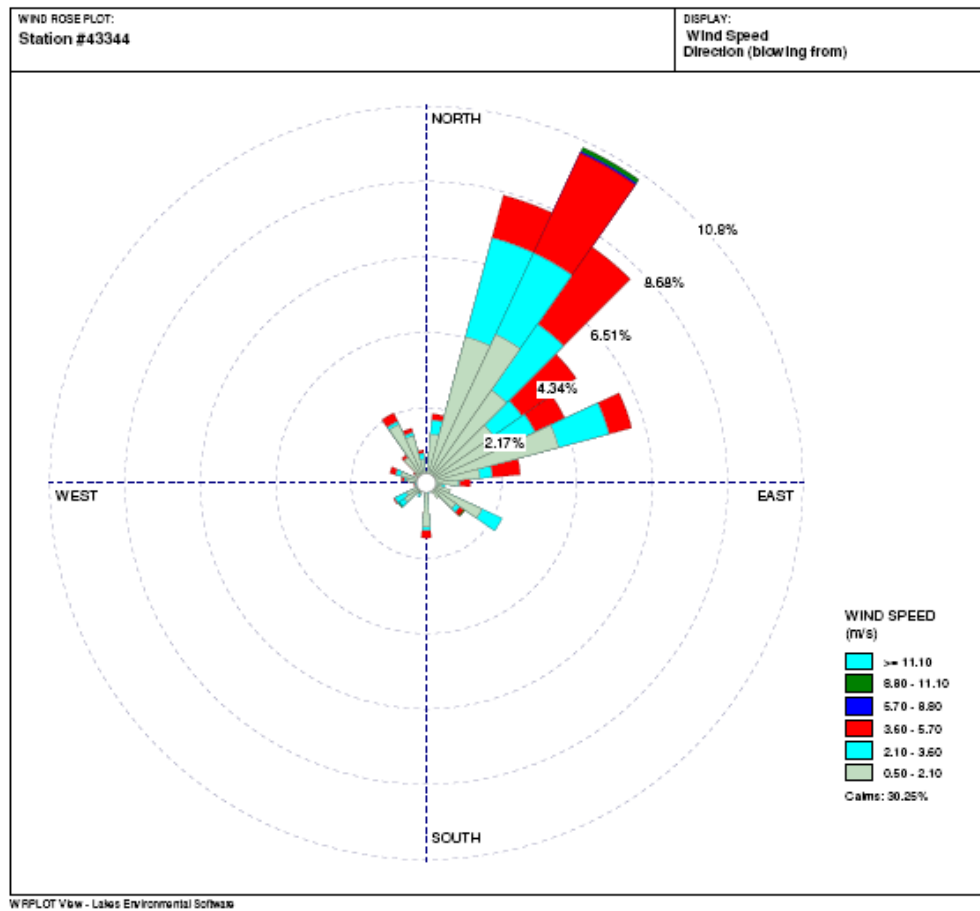
	Shankar Gyanchandani}					
2	Meena Ranglani	299600	67360	170016	28000	6.072~6
3	Paresh Kumar	728400	446244	258928	20000	12.95~13
4	Aruna Jogewar	170000	92400	99840	10000	9.98~10
5	Shrichand Chachra	129400	99060	62154	2500	14.83~15
6	Suman Singh-Kalkasa	113200	28720	76032	7000	10.86~11
7	Suman Singh-Baldeopur	170000	33400	102540	10000	10.25~11
8	Bhaoram Chakradhari	323750	37400	192154	6250	15.37~16
9	Rakhi Turhate	278000	27800	131540	12500	5.26~6
10	M/s Kavita Stone	317805	254506.11	56969	14274.88	5
11	Khairagarh Minerals (M N Patra)	226502	69692	156810	15345	10.21~11

### 3.0 Description of Environment

**Study Period: October 2020 to December 2020**

#### 3.1 Meteorology

Month	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
October 2020	17.4	31.7	49	56	38.6
November 2020	14.1	29.1	46	51	29.7
December 2020	16.9	29.8	36	41	10.2
<b>Total</b>					<b>79</b>



### 3.2 Ambient Air Quality

Total 10 Monitoring locations has been selected to understand the existing baseline of study area. The summary of the monitored ambient air quality within the study area is presented below:

#### Interpretation of Primary Data

**a. PM<sub>10</sub>:** The level of PM<sub>10</sub> indicates the level of dust and fugitive emissions in the surroundings. From the above results it can be observed that the maximum concentration of PM<sub>10</sub> was estimated to be in the range of 47.22 & 67.15  $\mu\text{g}/\text{m}^3$  respectively. The maximum concentration of PM<sub>10</sub> was recorded at location AAQ7 whereas the minimum concentration was recorded at location AAQ3. The average concentration of PM<sub>10</sub> during the study period was computed 57.09  $\mu\text{g}/\text{m}^3$ .

**b. PM<sub>2.5</sub>:** The maximum concentration of PM<sub>2.5</sub> (44.77  $\mu\text{g}/\text{m}^3$ ) during the study period was recorded at location AAQ1. The minimum concentration recorded 26.1  $\mu\text{g}/\text{m}^3$  at location AAQ4. The high concentration at location AAQ1 indicates that the area experiences vehicular movement. The average concentration of PM<sub>2.5</sub> during the study period was computed to be 35.41  $\mu\text{g}/\text{m}^3$ .

**c. Sulphur dioxide (SO<sub>2</sub>)** High level of SO<sub>2</sub> in ambient air indicates the presence of combustion fossil fuel and burning of wood and other plant material in the vicinity. The ambient air monitoring results presented above indicate that the highest average concentration of SO<sub>2</sub> is

experienced at the project site, i.e. location AAQ8. The constant traffic and regular movement of heavy vehicles (which use diesel as fuel) and the sampling station can be considered as the principle source of emission for SO<sub>2</sub>. The minimum of SO<sub>2</sub> recorded at all the monitoring locations during the study period was 9.03 µg/m<sup>3</sup>. The average concentration was observed in the range of 11.36 µg/m<sup>3</sup>.

**d. Oxides of Nitrogen (NO<sub>x</sub>)** The various forms of Nitrogen in NO, NO<sub>2</sub> and N<sub>2</sub>O are collectively called as Oxides of Nitrogen. The highest value 20.33 µg/m<sup>3</sup> while of NO<sub>x</sub> during the monitoring period was observed at location AAQ6 the minimum value 11.31 µg/m<sup>3</sup> was recorded at AAQ7. The average concentrations were 13.84 µg/m<sup>3</sup>.

**Conclusion** The descriptive statistics of ambient air quality monitoring at all the locations are indicating that pollution levels did not exceed the standards prescribed by the CPCB. It should be noted that 98th Percentile values computed at all the sampling locations were close to the maximum value observed at the respective locations. This indicates a negligible variance in the observations obtained.

### **3.3 Ambient Noise Levels**

The noise monitoring has been conducted for determination of noise levels at 10 locations during the October 2020 to December 2020 (study period).

Ambient noise levels were measured at 10 locations around the proposed project site. A noise level was found 53.21 Leq dB (A) during day time and 32.1 Leq dB (A) during night time at project site.

Minimum and maximum noise levels recorded during the day time ranges from 47.89 Leq dB (A) and 54.87 LeqdB (A) and noise during night time were ranges from 32.1 Leq dB (A) and 46.21 Leq dB (A) respectively for the rest of the study area. Thus, noise levels at all locations were observed to be within the prescribed limits of CPCB. From the above study and discussions, it can be concluded that noise levels in the study area are well within the prescribed limits as prescribed by the CPCB and State Pollution Control Board.

### **3.4 Water Environment**

To assess the existing water quality in the area, 10 ground water samples and 10 surface water samples were collected from the nearby villages. The water samples were analysed for physico-chemical and bacteriological properties in the laboratory and the observations of the analysis are summarised below:

#### **Ground water quality:**

- pH of the Ground water samples collected was in the range of 6.89-7.31.
- Total dissolved solids in the samples were in the range of 409-554 mg/l.
- Total Hardness was found to vary between 212.33-323.16 mg/l.
- Chlorides concentration was found to vary between 69-91 mg/l.

- Fluoride concentration was found to vary between 0.17-0.3 mg/l.
- Sulphates concentration was found to vary between 70.65-91.34 mg/l.
- Heavy metal concentrations in all samples were found to be well within the limits.

### **Surface Water Quality**

- pH of the surface water samples collected was in the range of 7.109-7.67.
- Electrical Conductivity in the samples was in the range of 641-867.
- Total Hardness was found to vary between 498-576 mg/l.
- Chlorides concentration was found to vary between 23-75 mg/l.
- Fluoride concentration was found to vary between 0.03-0.09 mg/l.
- Sulphates concentration was found to vary between 112.2-143.3 mg/l.
- Heavy metal concentrations in all samples were found to be well within limits.

### **3.5 Soil Quality**

Sampling was carried out at 6 locations during the study period. The summary of the results is presented below:

- PH of the soil samples were found to be in the range of 6.8-7.9
- Organic content of the soil samples was found to be medium exhibiting in the range of 0.74 % - 0.91 % and average fertility
- Soils in the area were found to be sandy silty clayey in texture with sand percentage in the range between 46.18-55.77 %, silt between 9.0-15.06 % and Clay 30.14-44.82 %.

### **3.6 Biological Environment**

#### **Flora Biodiversity of the Study Area**

Naturally grown trees were rarely observed in the core zone, there was no forest land involved in mine lease area, planted trees observed along the mine periphery which includes *Pongamia pinnata*, *Delbergia sissoo*, *Delonix regia*, *Cassia fistula*, *Azadirachta indica*, *Ailanthus excelsa*, *Mangifera indica*, *Psidium guava*, *Lucina laucociphala* & *Peltophorum pterocarpum*. However, various shrubs and herbs were naturally grown with the planted trees and along the surface water tank and natural drain in the core zone. A consolidated list of flora in Core Zone is given in EIA/EMP report.

The tree species, herbs and shrubs and major crops in the study area were documented during this baseline study. The list of floral species documented in the study area is enlisted in EIA/EMP report.

#### **Faunal Biodiversity of the Study Area**

For the documentation of the faunal biodiversity, studies in core and buffer zone (study area) with respect to mammals, reptiles, birds, and butterfly species, a baseline survey was conducted in December 2013. Core zone was devoid of major animals, however, list of species pertaining to Mammals, Reptiles, Avifauna and butterflies are given in EIA/EMP report.



### **3.7 Socio-Economic Environment**

The socio-economic status (Based on Census 2011) of the villages within the study area is given in table below :

Public opinion is the aggregate of individual attitudes or beliefs. It is very important to take opinion of the villagers about the project. The awareness will not only promote community participation but also enable them to understand the importance of the project and encourage them to express their view. To know the awareness and opinion of the villagers about the project, group discussion, meeting with school teachers/village leaders has been taken in the study area.

- Villagers want good infrastructure facility
- Most of the villagers are aware about kirari mining site
- Villages asked better health/medical facility.

The expectation of villagers from the mine management is for:

- Establishment and improvement of Health Centers
- Construction and improvement of sanitation and Drainage system including community toilets
- Improvement of roads including making them pucca and culverts.
- Building construction for Aanganwadi and primary schools
- Construction of Hand Pumps
- Play ground

### **4.0 Anticipated Environmental Impacts And Mitigation Measures**

#### **4.1 Ambient Air Quality**

To assess the impact of the proposed Cluster mining of limestone production, air quality modeling was carried out for the mining operations and the mineral transportation activities. The modeling was carried out using MoEF/CPCB approved ISCST3 model and CALINE4 models. The incremental ground level concentration of PM<sub>10</sub> due to proposed mining was predicted using the above-mentioned models and the resultant concentration of PM<sub>10</sub> were compared with the National Air Quality Standards.

The ISCST3 model was run for study period to find out the maximum ground level concentration of PM<sub>10</sub> generated from the different activities of the mining areas. The maximum 24-hourly calculated concentrations for mining activity like blasting, with-controlled and uncontrolled for drilling, loading/unloading, transportation, crusher and, was found to be ROM: 1.1µg/m<sup>3</sup>, 11.0 µg/m<sup>3</sup>, 30.0 µg/m<sup>3</sup>, in the SSW and WSW directions respectively.

**Maximum Calculated Concentration of Particulate Matter**

Sr. No.	Activity in the Quarry	Maximum calculated GLCs ( $\mu\text{g}/\text{m}^3$ ) at core area	Direction	Distance (km)
1.	<b>Overall Activities with control</b> ROM: (Drilling, Loading/unloading, crushing, transportation)	11.0	SSW and WSW	3.1
2.	<b>Overall Activities uncontrolled</b> ROM: (Drilling, Loading/unloading, transportation)	30.0		
3.	ROM: Blasting	1.1		

**CONTRIBUTED CONCENTRATION LEVELS PARTICULATE MATTER  
(AMBIENT INCLUDED MINING ACTIVITY)**

Sr. No	Activity in the mine	Maximum Baseline Concentration GLCs ( $\mu\text{g}/\text{m}^3$ ) at core area	Calculated GLCs ( $\mu\text{g}/\text{m}^3$ )	Resultant Concentration ( $\mu\text{g}/\text{m}^3$ )	Limit (Industrial, Residential, Rural and other area) ( $\mu\text{g}/\text{m}^3$ )
1.	<b>Overall Activities with control</b> ROM	67.15	11.0	78.15	100
2.	<b>Overall Activities uncontrolled</b> ROM)		30.0	97.15	
3.	ROM: Blasting		1.1	68.25	

**Air Pollution Control Measures**

Following measures shall be adopted to mitigate air pollution generated due to the mining activities:

- A. No blasting under unfavorable wind and atmospheric conditions.
- B. The production of blast fumes containing noxious gases will be reduced by the following methods:
  - Use of adequate booster/primer; and
  - Proper stemming of the blast hole.
- C. Drilling machines will be equipped with wet drilling arrangements or dust collector.
- D. Water sprinkling on haul roads at regular intervals.
- E. Installing fixed or mobile water sprinklers at ground stock yard and surface transport roads.
- F. Regular maintenance of vehicles and machinery.
- G. Dust respirators to workmen.
- H. Continuation of green belt development/plantation around lease boundary, road sides and dumps.

- I. Re-vegetation of backfilled area and inactive dumps.
- J. Good housekeeping would be practiced to control air pollution.

#### **4.2 Ambient Noise Levels**

The following sources of noise in the existing mine will increase due to proposed expansion:

- Drilling;
- Blasting;
- Operation of HEMM;
- Vehicular Movement.

Drilling & Blasting would be required for removal of overburden and extraction of limestone before excavation by shovel. Blasting, in addition to easing the hard strata, generates ground vibrations and instantaneous noise.

Impact on the ambient noise levels due to proposed expansion are estimated by mathematical modelling. From the modelling results, it is observed that the ambient noise levels (day time and night time) at all the locations will remain within permissible limits prescribed by CPCB and 90dB (A) norms of DGMS.

The following control measures are being adopted to keep the ambient noise levels well below the limits. The same will be continued and strengthen in proposed project:

- Drilling is being and will be carried out with sharp drill bits which help in reducing noise.
- Secondary blasting is being and will be totally avoided and Hydraulic rock breaker is being and will be used for breaking boulders.
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay is being and will be maintained.
- The blasting is being and will be carried out during favorable atmospheric condition and between 12.00 Noon to 2.00 PM when there is less human activity.
- Minimum quantity of detonating fuse is being and will be consumed by using alternatively Excel non-electrical initiation system.
- Proper maintenance, oiling and greasing of machines at regular intervals is being and will be done to reduce generation of noise.
- Provision of sound insulated chambers for the workers deployed on machines (HEMM) producing higher levels of noise.
- Proper designing of plant & machinery by providing inbuilt mechanism like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment.
- Green Belt/Plantation is being and will be developed (1,45,000 Nos.) around the mining activity area and along haul roads.
- Personal Protective Equipment (PPE) like ear muffs/ear plugs is being and will be provided to the operators of HEMM and persons working near HEMM; and
- Periodical monitoring of noise is being and will be done.

### **4.3 Water Environment**

#### **Impact of Mining on Surface Water and its Management**

Mining activity inevitably leads into sediment and suspended load due to erosional activity of overburden dump and loosened soil by blasting activity. The following measures will be taken up to reduce this load.

1. Dense plantation within mining lease area and OB dumps
2. Construction of siltation tank.
3. Construction of Garland drains around OB dump connected to settling tank.
4. Construction of toe wall at the base of OB dumps.
5. Construction of check dams on the slope of OB dump.

The impact due to mining on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during mining process. Surface runoff water will flow out through settling tank and thereafter through these drains outside lease area to avoid contamination of water.

Rainwater may cause some problem due to accumulation in the pit. Such water will be collected in sump in the mining pit and will be allowed to store and pumped out to surface setting tank to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards and such sites where dust likely to be generated and for developing green belt.

#### **Impact of Mining on Ground Water & its Management**

The impact of mining will be temporarily in the form of lowering of water table due to intersection if any. To check the lowering of water table, rain water harvesting in the form of accumulation of mine water in the pit and also suitable system of mine office roof top rain water harvesting will be constructed. These measures will help in recharge of ground water table. Whenever the scarcity of water in the nearby village Kalkasa and Baldeopur will observe, the same will be made available by the mine management through water tankers. Moreover as the limestone strata being fairly inert and chemically non-reactive, there will be very less chances of percolation of any harmful ingredients into the ground water causing pollution.

Drinking water to the workers will be provided from bore wells whose quality has already been tested and found potable.

### **4.4 Impact on Land Use**

The potential adverse impact of opencast limestone mining will be in the form of change in land use pattern. So reclamation of mined out land will be given due importance as a step for sound land resource management in the form of reclaimed land and water body.

The present land use and at the end of approved mining scheme period as per closure plan will be as follows:

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**Present Land Use of Mining Areas (Ha) (Source: Approved Mining Plan/Schme)**

Mine Lease	Area under pit	Area in dumps	Infrastructure	Roads	Green Belt	Crushing/ Screening	Storage of Top Soil	Storage of Mineral	Sub grade Dump	Virgin Land
Mahavir Prashant Bohra {Name Changed - Bol Bam Minerals Shankar Gyanchandani}	0.8500	0.0400	0.00	0.0200	0.0150	0.00	0.00	0.010	0.00	0.3600
Meena Ranglani	1.100	0.0400	0.00	0.030	0.020	0.00	0.00	0.020	0.00	0.2880
Paresh Kumar	0.8800	0.00	0.00	0.0140	0.3100	0.00	0.00	0.0100	0.00	0.00
Aruna Jogewar	0.6000	0.0400	0.00	0.0300	0.0200	0.00	0.00	0.0100	0.00	0.1500
Shrichand Chachra	0.4700	0.0200	0.00	0.0200	0.0100	0.00	0.00	0.0100	0.00	0.1170
Suman Singh-Kalkasa	0.4700	0.0200	0.00	0.0200	0.0100	0.00	0.00	0.0100	0.00	0.0360
Suman Singh-Baldeopur	0.5700	0.0200	0.00	0.0200	0.0100	0.00	0.00	0.0100	0.00	0.2200
Bhaooram Chakradhari	0.6300	0.0500	0.0100	0.0400	0.0600	0.00	0.00	0.0300	0.00	0.4740
Rakhi Turhate	0.6500	0.0800	0.0100	0.0200	0.0550	0.00	0.00	0.0300	0.00	0.2670
M/s Kavita Stone	0.495	0.000	0.000	0.082	0.090	0.00	0.00	0.000	0.00	0.000
Khairagarh Minerals (M N Patra)	-	-	-	-	-	-	-	-	-	-

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**Land Use of Mining Areas at the end of Scheme (Ha) (SOURCE: APPROVED MINING PLAN/SCHME)**

Mine Lease	Area under pit	Area in dumps	Infrastructure	Roads	Green Belt	Crushing/ Screening	Storage of Top Soil	Storage of Mineral	Sub grade Dump	Virgin Land
Mahavir Prashant Bohra {Name Changed - Bol Bam Minerals Shankar Gyanchandani}	0.8500	0.0400	0.00	0.0250	0.0250	0.00	0.00	0.0100	0.00	0.3450
Meena Ranglani	1.100	0.0400	0.00	0.0450	0.0300	0.00	0.00	0.0200	0.00	0.2630
Paresh Kumar	0.8800	0.3100	0.00	0.0140	0.00	0.00	0.00	0.0100	0.00	0.00
Aruna Jogewar	0.600	0.0400	0.00	0.040	0.035	0.00	0.00	0.0100	0.00	0.1250
Shrichand Chachra	0.4700	0.0200	0.00	0.0250	0.0200	0.00	0.00	0.0100	0.00	0.1020
Suman Singh-Kalkasa	0.4700	0.0200	0.00	0.0250	0.0200	0.00	0.00	0.010	0.00	0.0210
Suman Singh-Baldeopur	0.5700	0.0200	0.00	0.0250	0.0200	0.00	0.00	0.0100	0.00	0.2050
Bhaooram Chakradhari	0.6300	0.0500	0.0100	0.0500	0.0750	0.00	0.00	0.0400	0.00	0.4390
Rakhi Turhate	0.6500	0.0800	0.0100	0.0200	0.0700	0.00	0.00	0.0400	0.00	0.2420
M/s Kavita Stone	0.495	0.00	0.00	0.082	0.090	0.00	0.00	0.00	0.00	0.00
Khairagarh Minerals (M N Patra)	-	-	-	--	-	-	-	-	-	-

It is evident from the above that at the end of approved mining scheme, the mined-out area will be converted into a water body at the end of the mine life. The temporary land use for soil and waste dumps will also be converted into total plantation area.

No adverse impact is anticipated on land use of buffer zone associated due to the proposed cluster of limestone mine, as all the activities will be confined within the project site only. Mined out limestone will be transported to the crusher plant in covered vehicles through the existing road network.

#### **4.5 Impact on Biological Environment & Mitigation Measures**

##### **Impact on terrestrial Flora**

- Dust deposition on leaf lamina observed on nearby local plant species which may results in decline the rate of photosynthesis and retards the plant growth.

##### **Measures for Minimizing Impact on Flora**

- Dust issues are mainly raised in the area due to kuchha road, cumulative fugitive dust emissions by various crushers and minor mineral activities. To mitigate the impact regular water sprinkling will be carried out within the mine lease area as well as approach road.
- Stabilization of dumps by proper vegetation cover shall be done.

##### **Impact on Wildlife**

- There is no National Park, Wildlife Sanctuary and Biosphere Reserve within 10 km radius of the project site. Natural habitats are confined to very limited area like forest located near Tekapar Khurd village, which is 3.0 km away from the Cluster.
- No rare, endemic & endangered species are reported in the buffer zone. However, during the course of mining, the management will practice scientific method of mining with proper Environmental Management Plan including pollution control measures especially for air and noise, which will not cause any adverse impact on the surrounding wildlife.
- Fencing around the mine lease area already exist to restrict the entry of stray animals
- Green belt development will be carried out which will help in minimizing adverse impact on the flora found in the area.

##### **Measures for Minimizing Impact on Fauna**

Following measures will be adopted to minimize the impact of mining on faunal environment of the area.

- Measures will be taken to curb pollution due to mining activities on air, water, land& noise environment. Plantation around mine area will help in creating habitats for local faunal species and to create better environment for various fauna. Creating and developing awareness for nature and wildlife in the adjoining villages.

### **Impact on Aquatic Ecology**

- Mining activities will hardly disturb the existing aquatic ecology as very little mine water mostly having suspended solids will be pumped out and even this pumped out water will be treated before reaching the surface water body. Hence, there will not be any deterioration of water quality of water bodies due to mining
- Mining activity may increase sediment load and total dissolved solids in streams due to, surface run off, erosional activity of overburden dumps and loosened soil by blasting activity especially during rainy season and may affect water quality of natural water body and stream within mine lease area.

### **Greenbelt Development & Plantation Programme**

In order to facilitate the greenbelt activities, a nursery has been developed in the area and species such as Bamboo, Karanj, Gulmohar etc. have been planted. It is proposed to have plantation at 3 M x 3 M spacing, the rate of survival was aimed at 70 to 80% by regular watering & fencing was proposed to keep plants away from animal grazing. Local species have been/will be planted in consultation with local horticulturist.

Further, the breakup of the proposed afforestation programme with reclamation in progressive manner for entire life of mine is given in EIA/EMP report.

### **4.6 Impact on Socio-Economic Aspects & Management Measures**

The development of the project and associated activities will strengthen the economic development, civic amenities, and educational facilities in the project vicinity. Overall, due to employment generation and economic progress, there will be positive changes in the socio-economic condition of the people residing in the vicinity of the project site.

The proposed project of mining activities will provide additional employment to persons of different skills and trades. The local population will have preference to get an employment. The employment potential will improve economic conditions of these families directly and provide employment to many other families indirectly who are involved in business and service oriented activities. This will in-turn improve the quality of life in the region.

The proposed project will also help in development of ancillary industries. These will further boost the economic avenues for the local population.

### **5.0 Environmental Monitoring Programme**

The environmental monitoring for the mining operations of enhanced production will be carried out as follows:

- Air quality;
- Water and wastewater quality;
- Noise levels;
- Soil quality; and
- Greenbelt development.

A centralized environmental monitoring cell is established for monitoring of important and crucial environmental parameters to assess the status of environment regularly during mine



operations. With the knowledge of baseline conditions, the monitoring program will serve as an indicator for any deterioration in environmental conditions due to operation of the mine and so that suitable mitigation steps could be taken in time to safeguard the environment.

## **6.0 Additional Studies**

Occupational health needs attention both during construction and operation phases. However, the problem varies both in magnitude and variety in the above phases. The problems concerning occupational health in the operation and maintenance phase are primarily due to dust and noise, which could affect the workers from respiratory and hearing problems. The necessary personnel protective equipment will be given to all the workers.

All working personnel will be medically examined at least once in every year and at the end of his term of employment. This is in addition to the pre-employment medical examination.

## **7.0 Project Benefits**

### **7.1 Improvements In The Physical Infrastructure**

The impact on the civic amenities will be substantial due to the increase in production of existing mines in cluster. This will be taken care by widening and strengthening the road wherever required. The construction of new roads in the project area has enhanced overall transportation facilities. With improved transportation facilities including widening & strengthening, the communication facilities will improve after the commencement of expansion activities.

The basic requirement of the community needs will be strengthened by extending health care, educational facilities developed in the mining area and township to the community, providing drinking water to the villages, building/strengthening of existing roads in the area.

### **7.2 Socio-Economic Benefits Arising out of Mining**

The activities involved in mining and subsequent preparation of limestone will generate and enhance the employment potential both directly and indirectly. Local people will have employment opportunities as skilled, semi-skilled and unskilled laborers in mining, transportation and allied activities. Thus there will be an overall improvement in the socio-economic status of the people of the surrounding areas.

## **8.0 Budgetary Allocation For Environmental Management Programme**

The details of Environmental Management Programme for different environmental protection and control activities along with capital and annual recurring cost are given in EIA/EMP Chapter.

## **9.0 Conclusion**

The statutory clearances of ongoing lime stone open cast project will have positive impact on the local environment. With the effective implementation of the environment management measures as suggested in the EIA/EMP report and as recommended by MoEF, CPCB and State Pollution Control Board, the negative impacts will be minimized to a great extent. However, development of this expansion project will have overall beneficial impact/effect in terms of growth in regional economy, transform the region's economy from predominantly agricultural

**Draft EIA/EMP for Proposed Cluster of Eleven (11) Limestone Mine, Lease area: 10.803 Ha, located in Village Kalkasa & Baldeopur, Tehsil- Khairagarh, District- Rajnandgaon, State-Chhattisgarh**

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to significantly industrial, increase Government earnings and revenues and accelerate the pace of industrial development in the region.

The project will enhance the direct employment of personnel, mostly to the local/regional people. This project will also generate indirect employment to a considerable number of families, who will render their services for the employees and other associated workers of the project.

The project will also encourage ancillary industries in the region, which will not only increase the employment potential but also the economic base of the region will be further strengthened. Thus, in view of considerable benefits from the project, the proposed project is most suitable to meet the limestone requirement of the area and is advantageous to the region as well as to the nation.