

Executive Summary

The Environmental Impact Assessment report has been prepared in terms of EIA notification of the MoEF dated 14-9-2006 & its subsequent amendments, the EIA guideline Manual for mining of Minerals (Feb, 2010), of MoEF, Govt. of India for seeking environmental clearance for Limestone Mining Project, having mine area of 2.681 Ha, Located at Village- Krem Shrieh, Wahiajer, District- East Jaintia Hills, State- Meghalaya falling under Category B1.

The mining lease has been granted in favour of “Limestone Mining Project”, having Mine Area of 2.681 Ha, Located at atVillage- Krem Shrieh, Wahiajer, District- East Jaintia Hills, State- Meghalaya.

The estimated project cost is Rs. 20.0 Lacs. The mining plan has been prepared Limestone at an annual rate of 2,00,475 MT of the highest production. As per Mining Plan, the mineable reserves of the lime stone is 13,50,250 tones and the production of reserves during the plan period of years is around 10,02,375 tones in 5 years. Hence, the balance of reserves after plan period is 3,47,875 tones of which with the rate of production of 2,00,475 TPA, the reserve is sufficient for 6.37 years.. The systematic workings are proposed keeping in view the conservation of mineral, Protection of Environment and safety of human and machineries.

No natural water courses are observed in and near the lease area and no such thing will be obstructed by proposed mining activities. The workings will be far above the level of ground water table and thus ground water will not intersect at any stage in workings. Although no separate soil observed at proposed mining site, however any soil come across in thin layer or in cavities will be scraped and temporarily stacked separately at proposed site. The soil will be used for plantation during each monsoon. The waste generated during mining will be used in construction and maintenance of approach roads, construction of site services. The lessee will also sell the waste by permit from the concerning department. Rest waste will be dumped at proposed site as per the planning.

The proposed project is an opencast project, where mining of limestone will be done. Excavator shall be deployed for the removal of overburden & inter burden but its deployment

will be rarely & occasionally for 4-5 days in a month. Methods of mining will be open cast. Mining will be confined to the allotted lease area from which maximum (peak) 2,00,475 TPA of limestone will be excavated every year. Drilling and Blasting is proposed in this mining activity.

The water for drinking and sprinkling purposes will be supplied from the nearby area through tankers. Total water requirement for the project is 4.84 KLD~5.0 KLD which can further be divided in to drinking water requirement (1.44 KLD), dust suppression (2.20 KLD) and plantation purpose (1.20 KLD).

The baseline data was collected from Dec.-2019 to Feb.-2020 for winter season. Results of the baseline data show that the area is free from any form of pollution and this activity will not create any negative impact on the existing environment.

The proposed project is an opencast semi-mechanized mining project, where mining of Limestone will be done. Excavators shall be deployed for the removal of overburden & interburden. Methods of mining will be open cast semi-mechanized with drilling and blasting. Mining will be confined to the allotted lease area located in Village- Krem Shrieh, Wahiajer, District- East Jaintia Hills, State- Meghalaya from which a maximum of 2,00,475 TPA of Limestone will be excavated. Drilling and Blasting is proposed in this mining activity. Terms of Reference (ToR) for the proposed project has been granted by the Directorate of Environment, Meghalaya vide its letter no.ML/SEIAA/MIN/EJH/P-127/2021/132 dated, Shillong, the 23rd April, 2020.

Salient features of the project

1.	Name of Proponent	Shri. Iaidlang Bamon
2.	Full Correspondence Address Of Proponent And Mobile Number	Village- Wahiajer, District- East Jaintia Hills, State- Meghalaya.
3.	Name of Project	Limestone Mining Project
4.	Project Location	Village- Krem Shrieh, Wahiajer, District- East Jaintia

Shri. Iaidlang Bamon
Area- 2.681 Ha.
at Krem Shrieh, Wahiajer
East Jaintia Hills District

	(Plot/Khasra/Gata No.)	Hills, State- Meghalaya.																																																			
5.	Name Of Minor Mineral	Limestone																																																			
6.	Sanctioned Lease Area In Ha	2.681 Ha																																																			
7.	Max. & Min mRL within Lease Area	646 mRL & 634 mRL																																																			
8.	Pillar Coordinates																																																				
	<table> <tr> <th>Pillar</th><th>Latitude (N)</th><th>Longitude (E)</th></tr> <tr><td>1.</td><td>25°11'33.03"</td><td>92°23'23.04"</td></tr> <tr><td>2.</td><td>25°11'32.60"</td><td>92°23'24.20"</td></tr> <tr><td>3.</td><td>25°11'31.58"</td><td>92°23'24.02"</td></tr> <tr><td>4.</td><td>25°11'30.77"</td><td>92°23'23.75"</td></tr> <tr><td>5.</td><td>25°11'29.90"</td><td>92°23'23.01"</td></tr> <tr><td>6.</td><td>25°11'28.60"</td><td>92°23'24.50"</td></tr> <tr><td>7.</td><td>25°11'28.05"</td><td>92°23'23.52"</td></tr> <tr><td>8.</td><td>25°11'24.90"</td><td>92°23'22.86"</td></tr> <tr><td>9.</td><td>25°11'25.00"</td><td>92°23'19.40"</td></tr> <tr><td>10.</td><td>25°11'25.40"</td><td>92°23'17.30"</td></tr> <tr><td>11.</td><td>25°11'26.55"</td><td>92°23'16.22"</td></tr> <tr><td>12.</td><td>25°11'28.10"</td><td>92°23'18.40"</td></tr> <tr><td>13.</td><td>25°11'29.60"</td><td>92°23'20.58"</td></tr> <tr><td>14.</td><td>25°11'30.60"</td><td>92°23'22.10"</td></tr> <tr><td>15.</td><td>25°11'31.16"</td><td>92°23'22.25"</td></tr> <tr><td>16.</td><td>25°11'33.08"</td><td>92°23'22.50"</td></tr> </table>	Pillar	Latitude (N)	Longitude (E)	1.	25°11'33.03"	92°23'23.04"	2.	25°11'32.60"	92°23'24.20"	3.	25°11'31.58"	92°23'24.02"	4.	25°11'30.77"	92°23'23.75"	5.	25°11'29.90"	92°23'23.01"	6.	25°11'28.60"	92°23'24.50"	7.	25°11'28.05"	92°23'23.52"	8.	25°11'24.90"	92°23'22.86"	9.	25°11'25.00"	92°23'19.40"	10.	25°11'25.40"	92°23'17.30"	11.	25°11'26.55"	92°23'16.22"	12.	25°11'28.10"	92°23'18.40"	13.	25°11'29.60"	92°23'20.58"	14.	25°11'30.60"	92°23'22.10"	15.	25°11'31.16"	92°23'22.25"	16.	25°11'33.08"	92°23'22.50"	
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9.	Total Mineable Reserve	13,50,250 Tons																																																			

Shri. Iaidlang Bamon
Area- 2.681 Ha.
at Krem Shrieh, Wahiajer
East Jaintia Hills District

10.	Proposed Production	2,00,475 TPA
11.	Sanctioned Period of Mine Lease	10 years
12.	Production of Mine/Day	668.25 tones
13.	Method of Mining	Open Cast Semi Mechanized with Drilling and Blasting
14.	No. of Working Days	300
15.	Working Hours/Day	08 hrs max, Day Time
16.	No. of Workers	47
17.	No. of Vehicles Movement/Day	67 Dumpers
18.	Type Of Land	Private Land
19.	Nearest Metalled Road From Site	NH-6, at a distance of 0.78 km towards West.
20.	Name of the QCI Accredited Consultant With QCI No. And Period Of Validity	Geogreen Enviro House Pvt Ltd, Lucknow NABET/EIA/1720/IA0023 Extended 4 th July, 2021
21.	Any Litigation Pending Against The Project Or Land In Any Court.	No
22.	Proposed CER Cost	40,000/-
23.	Propose EMP Cost	2,68,500/-
24.	No. of trees to be planted	150 Saplings per year

AMBIENT AIR QUALITY

Particulate Matter (PM10):

The maximum value for PM10 was observed as $92.10 \mu\text{g}/\text{m}^3$ at Cement Plant (AQ3) while 24 hours applicable limit is $100 \mu\text{g}/\text{m}^3$ for industrial and mixed use areas. The area observes average PM10 concentration in the range of $30.0 \mu\text{g}/\text{m}^3 - 92.10 \mu\text{g}/\text{m}^3$ with the lowest concentration of $30.0 \mu\text{g}/\text{m}^3$ recorded at Thangskai Village (AQ8).

Particulate Matter (PM2.5):

The maximum value for PM2.5 was observed as $44.0 \mu\text{g}/\text{m}^3$ at Cement Plant (AQ3) while 24 hours applicable limit is $60 \mu\text{g}/\text{m}^3$ for industrial and mixed use areas. The area observes average PM2.5 concentration in the range of $18.0 \mu\text{g}/\text{m}^3 - 44.0 \mu\text{g}/\text{m}^3$ with the lowest concentration of $18.0 \mu\text{g}/\text{m}^3$ recorded at Thangskai Village (AQ8).

Sulphur Dioxide (SO2):

The maximum value for SO2 was observed, as $12.60 \mu\text{g}/\text{m}^3$ at Cement Plant (AQ3) while 24 hours applicable limit is $80.00 \mu\text{g}/\text{m}^3$ for industrial and mixed use areas. The area observes average SO2 concentration in the range of $4.0 \mu\text{g}/\text{m}^3 - 12.60 \mu\text{g}/\text{m}^3$ with the lowest concentration of $4.0 \mu\text{g}/\text{m}^3$ recorded at Umbadoh Village (AQ4). All the villages have observed value well under the prescribed limit.

Nitrogen Oxides (NO₂):

The maximum value for NO2 was observed as $21.70 \mu\text{g}/\text{m}^3$ at Cement Plant (AQ3) while 24 hours applicable limit is $80 \mu\text{g}/\text{m}^3$ for industrial and mixed use areas. The area observes average NO2 concentration in the range of $6.0 \mu\text{g}/\text{m}^3 - 21.70 \mu\text{g}/\text{m}^3$ with the lowest concentration of $6.0 \mu\text{g}/\text{m}^3$ recorded at Lumshnong Village (AQ5) and Umlaper Village (AQ7). All the villages have observed value well under the prescribed limit.

Noise Quality:

Ambient noise levels were measured at 08 locations around the proposed project site. Minimum and maximum noise levels recorded during the day time were from 48.1 Leq dB and 68.2 Leq dB respectively and minimum and maximum level of noise during night time were 39.2 Leq dB and 62.5 Leq dB respectively.

Ecology and Biodiversity:

There are no Ecologically Sensitive Areas present in the study area but some Reserved Forests are present in the buffer area of the project site.

Socio-economy:

The implementation of the Limestone mining project at over an area of 2.681 Ha situated in Village Krem Shrieh, Wahiajer, District- East Jaintia Hills, State- Meghalaya will throw opportunities to local people for both direct and indirect employment. The study area is slightly lacking in housing, water, electricity etc. It is expected that same will improve to a great extent due to proposed mining project and associated activities.

Impacts on Land Environment:

Mining is essentially an excavation of mineral. The land environment is greatly affected by it. Specially, in case of mining which is being carried out by opencast semi-mechanized method, it is expected to affect the land environment essentially.

Anticipated Impacts:**Land Use /Land Cover**

The land is totally stony and has limestone in large amount. This land is good for mining. There is no forest land or agriculture in the mine lease area. Land use pattern for preoperational, operational & conceptual stage of the mining as per mine plan for the proposed mine site is given below in Table 4-1: Present land use Pattern. The existing land use / land cover pattern within the study area (10 Km, Buffer including core Area) as studied through Site survey & satellite imagery is given as follows. As per the mine plan the exhausted benches will be reclaimed by mine rejects, spreading of topsoil and plantation will be done. It is also proposed to convert the pit into a water reservoir.

Impacts on Water Environment:

The mining process will not divert and utilize the surface & ground water. Quantity of water will remain the same. The existing background level of water quality as indicated by the baseline data revealed that impact on water environment will be insignificant in this project.

Anticipated Impacts:

Because of the open cast & semi mechanization method in the mining activity, the impact of mining operations on water quality is also expected to be insignificant. There would be no impact on the quality/quantity of ground water as existing ground water level in study area is deep. Surface water is also not diverted or disturbed. Therefore, there would not be any impact on surface water and ground water quality. The lease area is Hilly and Stony where only direct precipitation flows down the slope during rains. The water comes across in the workings during monsoon. The water will fill in the working pits. Some water will flow by joints and cracks and rest water has to dewater during and after the monsoon. The monsoon water which directly precipitates over the working will fill in the pit and rest water which precipitates outside the pit will flow down towards lower altitude side by slope of the area.

The rainfall remains around 2500 mm to 3000 mm per year towards maximum. The water accumulate in the working pit is being dewatered by 10 HP diesel operated pumps and this practice will be continued in future. The water will fill in the non-working pits for use for plantation and also dewatered in nearby nalahs. The rubble stone walls are constructed towards lower side of the dumps to check the wash off during monsoon. During rains the rainwater flow on natural slope of the surface, which flows during rains only in north-west direction.

Since the mining process is totally dry, no effluent will be generated hence no adverse impact on water is anticipated. Mining activity will be done by opencast semi mechanized method. The deposit will be worked from the top surface to above ground water table. No water table (aquifer) will be intersected by the mining activities. Hence there will not be any adverse impact either on the quality or quantity of ground water. There is a sufficient gap between proposed workings up to conceptual and level of ground water table, thus ground water will not be encountered in the workings at any stage.

Domestic Effluent

No domestic effluent is generated at the mine site due to absence of any colony in the mining area. Hence the question of contamination of ground water does not arise. Any adverse impact on the ground water regime is not expected from the domestic effluent.

Surface Run-Off

The land of the study area is semi-arid and the Landscape is hilly and stony. The threat of pollution due to surface run-off is also not possible as because entire study area does have any natural surface water course.

Mitigation Measures

There is a sufficient gap between proposed workings up to conceptual and level of ground water table, thus ground water will not be encountered in the workings at any stage.

Impacts on Air Environment:

Mining Operation carried out by opencast semi mechanized method generate dust particles due to various activities like Loading & Unloading of stone, and Transportation. The impact on ambient air quality in the area surrounding the mining area depends upon the pollutant emission rate and prevailing meteorological conditions. As it is an open cast semi-mechanized mine, particulate Matter (Dust) of various sizes is the only pollutant of any significance.

Anticipated impacts:

The major sources of air pollution in the proposed mine is dust generation due to extraction, loading and haulage of mineral and wind erosion of exposed material. In this present study, United States Environmental Protection Agency (USEPA-42 series) approved mathematical equations have been used to predict concentrations for different operations in mining including the mineral transportation. The operations considered for determining source strength for dispersion modeling are as follows:

- Excavation,
- Loading, and
- Haulage.

Mitigation Measures:

Haul Road: -The long life WBM (Water Bound Macadam) haul roads will be constructed and maintained for traffic movement.

Transport: - The speed of dumpers/ trucks on haul road will be controlled as increased speed increases dust emissions. Overloading of transport vehicles will be avoided. The trucks/ tippers will have sufficient free board. Spillage of ore on public roads will be cleared immediately and vehicles will play in safe speed.

Green Belt: - Planting of trees all along main mine haul road and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of dumpers/trucks.

Other Mitigation Measures

- Water sprinkling will be done on the roads regularly.
- Care will be taken to prevent spillage by covering the carrying vehicles with tarpaulin and sprinkling of water, if dry.
- Fortnightly scraping of road in order to keep the roads almost leveled. This will ensure smooth flow of vehicles and also prevent spillage.
- Proper tuning of vehicles to keep the gas emissions under check.
- Plantation of trees along the roads to help reduce the impact of dust in the nearby villages.

Impacts on Noise Environment:

The area general represents calm surroundings. There is no heavy traffic, industry or noisy habitation in the area except the existing mine as the project is proposed for open cast semi-mechanized mining method.

Anticipated Impact:

The area general represents calm surroundings. There is no heavy traffic, industry or noisy habitation in the area except the existing mine as the project is proposed for open cast semi-mechanized mining method.

Mitigation Measures:

Proper maintenance of all transportation vehicles will be carried out which help in reducing noise during operations Mitigation measures due to other source of noise will be mitigated as follows:

S. No.	Measures
1.	The adequate silencers will be provided in diesel operated mine Machineries and trucks and tractors.

2.	Compact and leveled haul road are proposed for smooth running of transport vehicles.
3.	The transport vehicles should be filled up to rated capacity of the vehicle to minimize the noise.
4.	The shrubs and bushes located in the area and proposed plantation will check the propagation of noise.
5.	The bumps on haul/ approach roads are proposed to remove time to time. The voids on haul roads are proposed to fill by waste and leveled time to time.
6.	Drilling with sharp bits and control blasting will minimize the noise pollution.

Environmental Management Plan (EMP):

Proper environmental management plan is proposed for “Limestone” mining project to mitigate the impact during the mining operation.

- No labour camps will be established on site.
- No cooking, or burning of woods will be allowed in the nearby area.
- Prior to commencement of mining, a short awareness program will be conducted for labours to make them aware of way of working and various precautions to be taken while at work. Such program will be repeated occasionally.
- In the event of any some causality or injury to any animal occurs, proper treatment will be given.
- No tree cutting, chopping, lumbering, uprooting of shrubs and herbs will be allowed.
- Corridor movement of wild animals, if exists mining operations will be avoided in the area.
- It will be ensured that noise produced due to vehicles movement while carrying stone is within the permissible noise level.
- No piling of Stone will be done in adjoining area.
- If wild animals are noticed crossing the area, they will not be disturbed or chased away, instead the labors will move away from their path.

Environment Monitoring Program:

S. No.	Activity	Schedule
Air Pollution Monitoring		
1.	Ambient air monitoring of parameters specified by MoEF (PM ₁₀ , SO ₂ & NO ₂).	Twice in a Year except monsoon
Water Quality Monitoring		
2.	Monitoring water quality surface water from the river	Twice in a Year except monsoon
3.	Monitoring of one sample of tube well and open well at mine / nearby location. Parameters are essential parameters as per IS: 10500:2012.	Twice in a Year except monsoon
4.	Monitoring of water spray requirements	Log-sheet of water spray will be maintained on daily basis
Noise Quality Monitoring		
5.	Noise in the ambient atmosphere in mining lease	Twice in a Year except monsoon
Greenbelt Maintenance		
6.	Monitoring schedule for Greenbelt development as per mining plan	Yearly
Soil Quality Monitoring		
7.	Soil at six locations	Twice in a Year except monsoon

The proposed project is expected to provide employment to local people in different activities such as mining, sizing (sieving) transportation and plantation activities. The revenue generated from the production and sale of mineral will also add to the exchequer of government, which in turn will help in the growth of state economy. Excavated material will cater the huge increasing demand of mineral in the fast-growing construction industry of Meghalaya and nearby states etc. The project is not expected to have any major adverse impact on the environment and whatever impacts are anticipated during the EIA study will be minimized with the help of suitable mitigation measures.

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