

EXECUTIVE SUMMARY

Introduction

The Project Proponent, Shri Royal A. Sangma has applied for mining lease for minor mineral (Limestone) in her privately owned land over an area of 1.00 Ha. located at Bagli, Khonjowai, District- South West Khasi Hills, and State- Meghalaya. The Project has been planned for a production of 54474 TPA.

In the present case the State Expert Appraisal Committee, Meghalaya (SEAC) in its ToR meeting followed by SEIAA meeting issued TOR letter vide no. ML/SEIAA/MIN/SWKH/P-192/2021/766 dated, Shillong, 06 October, 2021 for undertaking detailed EIA study for the purpose of obtaining environmental clearance in accordance with the provisions of the EIA Notification; 2006.

In order to assess to potential environmental impacts likely to arise due to proposed Limestone mine at Bagli, Khonjowai, District-South West Khasi Hills, and State- Meghalaya, Shri Royal A. Sangma has retained **Indian Mine Planners & Consultants, Kolkata** to undertake Environmental Impact Assessment studies. The report envisages the assessment of the impact of various environmental components and its mitigation measures in order to minimize the adverse impacts.

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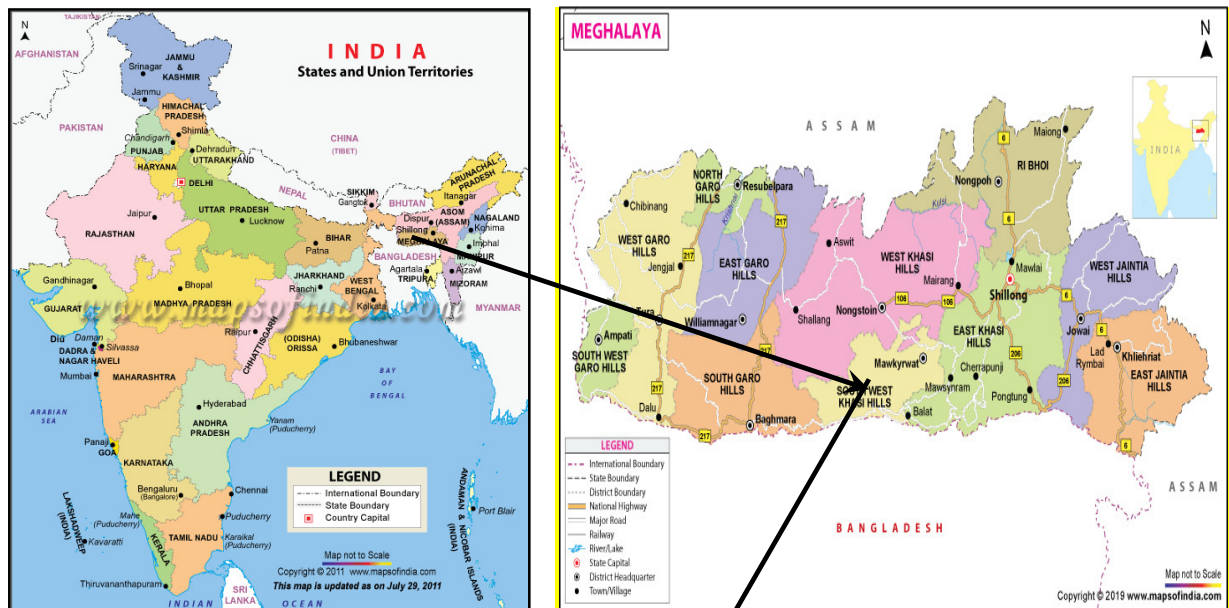
Description of the Project

The salient features of the proposed Limestone mine are as under:-

Project Name	Bagli Limestone Mine
Location of mine	At- Bagli, Khonjowai, District - South West Khasi Hills, State – Meghalaya.
Latitude	25°12'24.66" N TO 25°12'30.38" N
Longitude	91°4'06.62" E TO 91°04'12.95" E
Topo sheet number	780/12
Land use	1.00 Ha.
Minerals of mine	Limestone
Total Mineable reserves	2,72,371 Tonnes
Life of mine	5 years
Proposed production of mine	54,474 TPA / 182 TPD
Method of mining	Opencast, semi-mechanized
No of working days	300 days
Water demand	Total water requirement is about 4.0 KLPD (Drinking & Dust Suppression + Greenbelt)
Sources of water	Water for drinking purpose will be met from nearby villages. For sprinkling & plantation water will be taken from Private tanker.
Man power	36
Nearest railway station	Guwahati Railway Station (245 Km NE)
Nearest airport	Umroi Airport (179 Km NE)
Seismic zone	Zone V

Vicinity map and study area map of the 10 km radius around the project site is presented in **Figure 1** and **2**.

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South West Khasi Hills

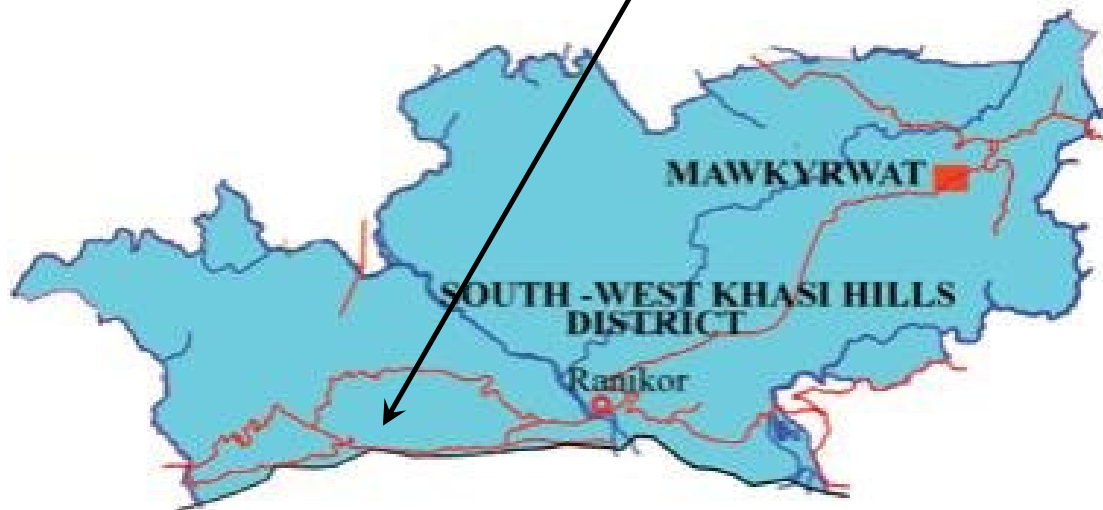


Figure 1
Vicinity Map

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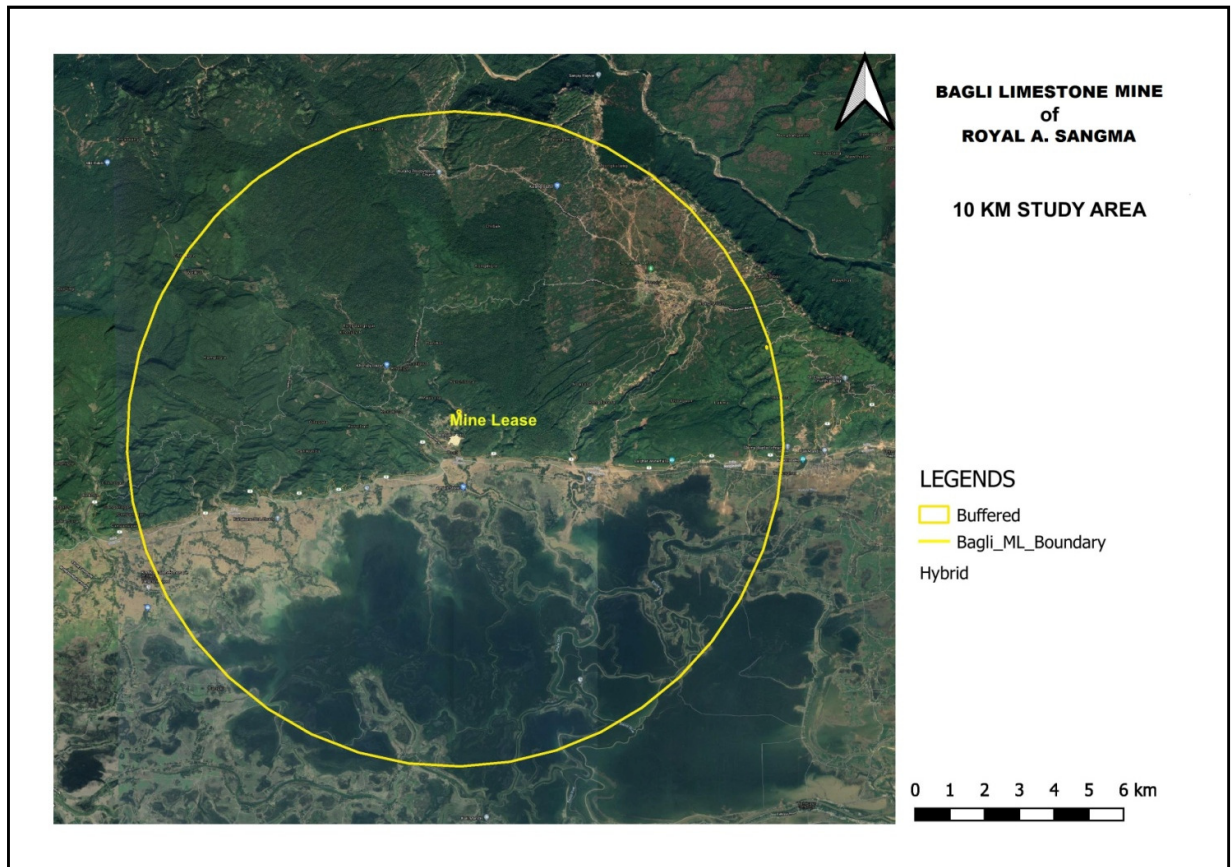


Figure 2
10 km Radius Map around the Project Site

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Basic Requirement for Proposed Project:

Details are presented below:

Sl. No	Requirement	Approx quantity
1.	HSD (Diesel)	100 liters/ day
2.	Power gel 901(Explosives)	19.875 Kg/day

Mining Method:

Semi Mechanized open cast mining will be undertaken with drilling and blasting.

- ❖ The width of each bench shall always be maintained to be not less than the height which is 6 m.
- ❖ Since the deposit in this area is massive and compact in nature, it is proposed to carry out only opencast semi-mechanized mining during this plan period, i.e. five years.
- ❖ Drilling and Blasting-Jack hammer drill machine will be deployed for drilling of shot holes ranging from 39 to 34 mm diameter and breaking of limestone at the required size will also be done manually. For blasting of holes with burden and spacing of 0.8m X 1.0m in a staggered grid pattern would be adopted.

Description of the Environment:

The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, Land and Socio-economic were generated during December 2020 to February 2021 in the study area covering 10 km around the proposed Limestone. Other environmental data on flora and fauna, land-use pattern, forest etc were also generated through field surveys and also collected from different State Govt. Departments.

Air Environment:

Ambient air quality was monitored at 9 locations. Results indicate that concentrations of PM_{2.5}, PM₁₀, SO₂, NO_x are well within the prescribed standards.

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PM ₁₀ -	73-93 µg/m ³
PM _{2.5} -	33-43 µg/m ³
SO ₂ -	11.2-18.9 µg/m ³
NO _x -	17.1-27.2 µg/m ³

An automatic weather monitoring station was installed at the project site to record micro-meteorological data. Pre-dominant wind directions were observed in the winter season is from S & SW

Noise Environment:

The noise levels in the study area are within the prescribed standards. Noise levels ranges from 53.4 dB (A) to 56.2 dB (A) during day time and 39.9 dB (A) to 42.0 dB (A) in the night time.

Water Environment:

It has been observed that all the physico-chemical parameters and heavy metals of water samples from surface and ground water are below the stipulated drinking water standards. The pH, TDS, and Hardness of the ground water were found in range of 6.73-7.21, 97- 111 mg/l and 27.10-37.30 mg/lit respectively, whereas the surface water showed pH 6.66-6.93, TDS 280.30-297.20 mg/lit and Hardness 33.6-38.2 mg/lit.

Land Environment:

The break-up of the land use for the project is given below:

Breakup of Land Use **Existing Land Use pattern**

Category	Area in Hectares
Quarry	0.00
Road	0.01
Total area in use	0.01
Balance unused area	0.99
Total Applied Lease Area	1.00

Land Use pattern after first five years plan period

Category	Area in Hectares
Quarry Land including road	0.64
Green belt in Safety Barrier	0.33
Dump with parapet wall and garland drain	0.03
Total area in use	1.00
Balance unused area	0.00
Total Applied Lease Area	1.00

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Land Use pattern after life of the mine

Category	Area in Hectares
Mined out Land including Reclamation	0.64
Green Belt (within Safety Barrier)	0.36
Total area in use	1.00

Soil:

The soil quality assessment was carried out at seven locations.

Core Zone: The result shows that pH is 6.28. The availability of many plant nutrients in the soil changes as a result of reactions in the soil, which are largely controlled by soil pH. Amount of primary nutrients like Organic Carbon 1.66 %, the available nitrogen 26.9 mg/100g is lower in range, the available Potassium 0.61 mg/100g is moderate in range while available Phosphorous 0.76 mg/100g is higher in range, and Primary nutrient profile shows that soil is low in fertility due to the availability of low amount of nitrogen.

Buffer Zone: The result shows that texture of soil has Loamy sand texture. pH ranges from 6.17 to 6.54. Amount of primary nutrients like Organic carbon 1.53% to 1.69%, the available nitrogen 23.8 to 29.8 mg/100g, the available phosphorus 0.69- 0.86 mg/100g is higher in range while Available Potassium 0.59 to 0.76 meq/100g is lower in range, Primary nutrient profile shows that soil is low in fertility due to the availability of low amount of nitrogen, available potassium.

Flora & Fauna:

The density of the plant in core zone in general is very low due to rocky terrain and low soil content. The floral found in the whole of the study area are representative of the Tropical Lower Montane Forest, Tropical Semi-Evergreen, Moist-Broadleaf Forest, Tropical Deciduous/Semi-Deciduous, Broadleaf Forest and Tropical Sparse trees. There are no schedule I Species of Fauna found in both core as well as buffer zone. The main crops grown in nearby areas are Wheat, rice, potatoes and pulses.

Socio-economic Status:

The study has been conducted by primary survey and secondary data

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source from Census of India 2011.

The primary socio economic study has been conducted in villages. The results are discussed below:

- **Core Zone:** There is no habitation in the core zone
- **Buffer Zone:** The total number of Households of the study area in rural village area are 1775 as per. The details are given below.

- **Population:**

The total population of the study area is 10362 constituting 5424 Male and 4938 Female.

- **Social Structure**

The proportion of Scheduled Caste (SC) population within the study area is 0.18 % and the percentage of schedule Tribe (ST) is 89.38%.

- **Literacy**

The total proportion of literate within the study area is 52.81% of total population. In percentage the male literacy 30.15% and the female literacy is 22.66% respectively within study area.

Anticipated Environmental Impact & Mitigation Measures:

1. Land Environment: The proposed project of Limestone mining will definitely change the land use. However the area will be reclaimed by the following measures:

- To minimize the effect of mining plantation will be in done along the 7.5m boundary of the mine area and after the exhaustion of the pit whole area will be reclaimed into green cover. After the conceptual mining there will be a mine void which will be extensively planted.
- Mining operations will be confined strictly within the demarcated area.
- During plan period, gritty soil will be dumped at north-Eastern side of the applied area with suitable precautions. Few quantity of the generated gritty soil would also be used for road maintenance and plantation program. After exhaustion of mineable reserve quarry will be reclaimed to the extent

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possible.

- The dust generation due to the mining will be minimized by sprinkling of water through water sprinkler.
- No effect on public buildings or monuments is envisaged as there are no public buildings/ monuments in the close vicinity of the mining lease area.

2. Water Environment: Total water requirement in the proposed mining project is 4KLD. Drinking water will be sourced by from nearby villages by water tanker. Mining will be restricted up to a depth of 182 mRL. There is no possibility of mining encountering any surface/subsurface water body. To avoid contamination of ground water from the open defecation by workers, toilets will be provided for the workers at site with septic tank followed by soak pit.

3. Air Environment: The air borne particulate matter is the main air pollutant contributed by opencast mining with drilling and blasting. Various emission sources are identified from the proposed mining operations. However the area will be reclaimed by the following measures:

- Drilling machines will be equipped with dust collector arrangement and wherever required wet drilling arrangement will be used to prevent generation and spreading of dust.
- Personnel working on the drills and other mining activities will be provided with dust mask and other necessary Personal Protective Equipments (PPE). Health checkups will be done biannually to monitor the health of the workers.
- Regular maintenance of vehicles and machinery will be done.
- Water tankers with suitable sprinkling system will be deployed along haul roads and other unworked areas to control fugitive emission.

4. Noise Environment: The proposed mining operations will be carried by using latest equipments by open cast semi mechanized mining method. Hydraulic excavator will be used in excavation. Hence workers will be given protective gears such as goggles, dust masks, gloves, helmets and earmuffs. Plantation will be done to create cover from high noise. Task rotation of workers will be done exposed to noise.

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5. Biological Environment: There is no Forest area diversion is required in the proposed mining. The fauna in the vicinity of the mine is restricted to few common species. There will hardly be any negative impacts on terrestrial eco-system comprising birds and animals as the ML area is only 1.00 Ha. On the contrary, with progressive growth of greenery, terrestrial eco-system will improve in course of time. There will be no Schedule-I species found in study area.

6. Socio- Economic environment: The project will enhance direct and indirect employment in the area. Therefore overall economic development is much likely after the commencement of the project. The project will provide skill based training to the locals and will generate chance of indirect employment in the area.

7. Mine Waste: Few quantity of the generated gritty soil would also be used for road maintenance and plantation program. After exhaustion of mineable reserve quarry will be reclaimed to the extent possible. To prevent dump failure/soil erosion, toe-wall with weep-holes and garland drains will be provided towards lower side of the dumps to check the wash off during the rainy season. Hazardous waste such as used oil shall be stored properly and sold to registered-processor. Domestic waste water due to daily human activities which shall be properly disposed off into septic tanks followed by soak pits. Other domestic solid waste such as Wrappers, foils, left- over food material etc shall be collected in separate bins. Biodegradable waste will be composted and used as manure.

8. Impacts due to transportation: The entire mineral will be transported through trucks. Transportation shall be done by 2 no. of 10 tones truck. As per study done there will not be any congestion due to proposed project on the road.

Environmental Monitoring Programme:

The environmental monitoring is important to assess performance of pollution control equipment installed at the project site. The sampling and analysis of environmental attributes including monitoring locations will be as per guidelines of the Central Pollution Control Board/State Pollution Control Board

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- Environmental monitoring will be conducted on regular basis by Shri Royal A. Sangma to assess the pollution level in and around the project area
- Adequate budgetary provision shall be made towards implementation of Environmental Management Plan

Risk Assessment & Disaster Management Plan: Mining will be carried out by semi mechanized opencast mining, with mining equipments as hydraulic excavator, dumpers etc involving drilling and blasting. Mining will be done under strict supervision hence the rate of operational risks is minimal.

Rehabilitation and Resettlement: There will be no rehabilitation and resettlement on account of mining. There is no human habitation at the project site and the land is deemed forest land.

Project benefits: The proposed mining project has a significant positive impact on the socio-economic environment and it will help sustain the overall development of the area.

The proposed project significantly contributes the economic development by providing direct employment to 36 people and indirect employment to many more people in the area. PP will organize Camps for vocational training to generate employment.

Environmental Management Plan: Preparation of Environmental Management Plan (EMP) is required for formulation, implementation and monitoring of environmental protection measures during and after commissioning of the proposed mining project. The project cost is Rs. 28.50 Lakh and the EMP capital cost Rs. 5,22,500 (Annual recurring cost).

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Budgetary Provision for Environmental Measures:

Sl. No.	Particulars	Annual Recurring Cost (In Rs)
1.	Air Pollution (dust suppression along road, water sprinklers)	1,00,000
2.	Plantation & Maintenance	40,000
3.	Environmental Monitoring & Reclamation	1,20,000
4.	Maintenance of Settling Tank, Garland Drains etc.	80,000
5.	Personal Protective Equipments	40,000
6.	CER activity	1,42,500
Total		5,22,500

Corporate Environmental Responsibility:

Corporate Environmental Responsibility (CER) refers to responsibility of a company to ensure positive impact on environment, consumers, employees, communities, stakeholders and all other members of public sphere. The CER activities are increasingly being taken up by the project proponents not only as fulfilling of mandatory provisions but also for the formation and or enhancement of brand image. Besides the above, CER is seen more as a responsibility towards society rather than a business promotion activity.

In order to improve the quality of life of nearby villagers of the proposed project area, amount of Rs. 1,42,500 which is 5% of the total cost (Rs.28,50,00) of project shall be spent under the guidance of District/Local authorities (MoEF&CC Notification for CER activity dated 01.05.2018).

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Budgetary Provision for CER Activity

CER Budget				
S. No.	Activity	Per Unit Cost	No.	Total Cost INR
1	Provisions for Imparting vocational training at near village for technical skills, self employment training for women and youngsters.	-----	-----	5,000.00
2	Energy Conservation i.e. Distribution of LED Bulbs	100	100	10,000.00
3	Provisions for Water purifier & its maintenance (1 no.) at CHC center of Near village.	15000	4	60,000.00
4	Provision of Toilets in the nearby villages	15000	4	60,000.00
5	Organization of Health Camps Provisions for Health Check-up camp at Gram Panchayat of Near village			5,000.00
6	Distribution of Sanitary Napkins, Contraceptives etc.			2,500.00
Total				1,42,500.00

Occupational Health and Safety:

Effective implementation of measures suggested for pollution control will ensure safety and health of the workers.

Green belt development: It has been initiated by the proponent 0.33 ha will be planted during plan period. Total 0.36 ha will be planted after the life of the mine. Locally thriving species will be planted in consultation with forest department.

Among other environmental protection following measures are listed below:

- Sprinkling of water for dust suppression on mine haul roads.
- Regular Compaction & grading of haul roads and service roads to clear accumulation of loose material.
- Avoid overloading of dumpers and consequent spillage on the roads.
- Good maintenance of vehicles & machinery.
- Water sprinklers of fixed type will be provided at the mine approach roads from mine face / benches to crush hopper to prevent the generation of dust.