

EXECUTIVE SUMMARY**1.1 INTRODUCTION**

Smt. Kuntimai Tangdhara is the owner of the Rikaleng Limestone Mine, located at Sohbar Village, Sohbar Sirdarship, East Khasi Hills, Meghalaya covering an area of 2.3125 hectare. The mine has been operational since 2018. The Environment Clearance for the mine was granted by the District Environment Impact Assessment Authority, East Khasi Hills, under the EIA notification dated 15th January, 2016, through letter no. EKJ.20/17/2017/10/47/1002 dated 5th January, 2018. In line with the office memorandum issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India, on 28th April 2023 (letter no. F. No. IA3-22/11/2023-IA.III (E-208230)), the project proponent is now seeking reappraisal of the existing mine from the SEIAA, Meghalaya. (Copy of O.M. is enclosed as **Annexure-I**)

According to the Ministry of Environment, Forest & Climate Change Office Memorandum dated 12th December, 2018 which states that-

“If the cluster or an individual lease size exceeds 5 ha. the EIA/EMP be made applicable in the process of grant of prior Environmental Clearance”.

A cluster has been formed, comprising a total area of 20.584 hectares. Consequently, the mine project will be classified as Category B1.

1.1.1 LOCATION OF LEASE AREA

The mining lease is located at village- Sohbar Village, Sohbar Sirdarship, East Khasi Hills, Meghalaya. The mining lease area is 2.3125 ha with proposed production capacity of 2,07,825 TPA ROM (Mineral Limestone- 1,87,050 TPA & Mineral Waste/Subgrade- 20,775 TPA).

1.1.2 DETAIL OF MINING LEASE

S. No.	Particulars	Details
1.	Name of Project	“Rikaleng Limestone Mine
2.	Location	Sohbar Village, Sohbar Sirdarship, East Khasi Hills, Meghalaya
3.	Lease Area	2.3125 Ha.



Project:- “Rikaleng Limestone Mine”		
Applicant:- Smt Kuntimai Tangdhara		Executive Summary
4.	Land Type	Private Land
5.	Seismic Zone	zone V very high damage risk zone (MSK IX or more) category

1.2 PROJECT DESCRIPTION

Initially the letter of Intent (LOI) for mineral Limestone, Area: 2.3125 hectare was sanctioned in favour of Smt Kuntimai Tangdhara by Office of Divisional Forest Officer Khasi Hills Division, Shillong in favour of Smt Kuntimai Tangdhara vide order no. KH/8/ML/Limestone/68/9005 dated 17.10.2017.

The Environmental Clearance was issued by Office of Deputy Commissioner: DEIAA, East Khasi Hills District, Shillong, Govt. of Meghalaya vide order No. EKJ.20/17/2017/10/47/1002 dated 05.01.2018.

The Current approved Mining Plan with PMCP by the Mining Engineer, Directorate of Mineral Resources Meghalaya: Shillong has been issued vide order DMR/MM/79/2017/26-A dated 31.07.2024.

The mineable reserves are about 9,35,400 MT to produce limestone at the rate of 2,07,825 TPA ROM (Mineral Limestone- 1,87,050 TPA & Mineral Waste/Subgrade- 20,775 TPA). The mining operations will be carried out by open cast semi - mechanized method

1.2.1 GEOLOGY

Local Geology

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

Table 11.1: Local Geology

Geological Age	Group Name	Formation Name	Rock Type
Recent	Newer Alluvium	Unclassified	Sand, Silt and Clay
-----UNCONFIRMITY-----			
Eocene	Jaintia Group	Shella Formation	Lime Stone

Source:- Approved Mining Plan dated 31.07.2024

Physiography

The topography of the lease area is Hilly and Stony. The elevation range within the lease area is 75 mRL highest contour to 27 mRL lowest contour.

1.2.2 GEOLOGICAL AND MINEABLE RESERVES

Mineable Reserve : 9,35,400 MT
Production : 2,07,825 TPA ROM
Life of Mine ~ 5 Years as per the approved mining plan.

1.2.3 MINING

The mining is being/will be done by open cast semi-mechanized method of mining. The salient features of mode of working as per approved Mining Plan with PMCP are:-

- The mining is being/will be done by heavy earth moving machineries, i.e. by hydraulic excavator, Loaders, Rock Breakers, tippers.
- Blasting is being/will be done by short or long holes with the permission of DGMS
- Bench height and width are being/will be maintained as 6 meters each considering semi-mechanization.
- The hydraulic breakers are being/will be used for excavation of mineral.
- The fencing around the pit/ excavation is being provided to check the inadvertent entry of human and livestock in the working zone.
- Drinking water is being/will be brought from public water supply available at village and stored in water pitchers at site office and near the working sites for drinking purpose and in cement tanks near the site office for other purpose.
- The soil which may come across during mining in patches or in cavities is being/will be scraped and stacked separately in 0.01 ha area near pillar 'I' and will be used for plantation in monsoon.
- Garland drains with parapet walls is being provided and will be mentioned around the pit to check the entry of monsoon flowing water towards working pit.
- The site services like site office, water tank, workshop, kitchen, bathroom etc. are already provided and will be maintained near mining lease in lessee's own land.
- In the period of this Mining Scheme the lessee will develop Twelve benches i.e. From Bench levels 63mRL (Top Bench), 57mRL, 51mRL, 45mRL, 39mRL, 33mRL, 27mRL, 15mRL, 9mRL, 3mRL, -3mRL and -9mR (Lowest Bench).
- The approach roads up to faces is being provided and will be maintained time to time for movement of vehicles.



- The bench slope is being/will be maintained 85°. The loading of mineral is directly from pits or from temporary stack yard.
- The mineral waste is being/will be dumped in Southern side of the lease area near pillar '1' in 0.10 ha area for 6 meters in height in two terraces of 3 meters height each.
- The stone walls is being provided and will be maintained towards lower altitude side of the dumps to arrest the solid wash off.
- Drilling is either by wet process or by using dust extractors.

1.2.4 PRODUCTION DETAILS

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

Table 1.2: Production Details

Year	Tentative Excavation in Tons (ROM)	Waste/Sub Grade of Limestone in Tons	Mineral Limestone in Tons
First Year	2,07,825	20,775	1,87,050
Second Year	2,07,825	20,775	1,87,050
Third Year	2,07,825	20,775	1,87,050
Forth Year	2,07,825	20,775	1,87,050
Fifth Year	2,07,825	20,775	1,87,050
Total	10,39,125	1,03,900	9,35,225

Source-Approved Mining Plan with PMCP 31.072024

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	Present (Ha)	End of 5th year (Ha)	End of mine (Ha)
1.	Top Soil Dump	--	--	--
2.	Waste Dump	0.10	0.10	0.10 (Reclaimed by plantation)
3.	Excavation (voids Only)	2.00	2.00	2.00 (Plantation on upper benches – 1.33 ha & Water Reservoir-0.67 Ha)



4.	Roads	0.020	0.040	0.040
5.	Buildup Area	--	--	--
6.	Township Area	--	--	--
7.	Afforestation	0.05	0.10	0.15
8.	Reclamation (Backfilled)	--	--	--
9.	Mineral Storage	--	--	--
10.	Processing (Crushing)	--	--	--
11.	Undisturbed area	0.1425	0.0725	0.0225
Total		2.3125	2.3125	2.3125

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 nine locations in the study area. The baseline data has been collected in the Post Monsoon Season (October 2023 to December 2023) The detail of the sampling locations is given in below: -

Table 1.4: Sampling Location

S. No.	Sampling Location	Distance (Km)	Direction	Components
1.	Mine Site	--	--	Air, Ground Water, Noise, Soil
2.	Sohbar	3.2	N	Air, Ground Water, Noise, Soil
3.	New Komorah	1.0	E	Air, Ground Water, Noise, Soil
4.	Nongjri War	4.1	ENE	Air, Ground Water, Noise, Soil
5.	Umsaw	2.8	SSW	Air, Ground Water, Noise, Soil
6.	Mawthang	3.7	NW	Air, Ground Water, Noise, Soil
7.	Umwai	3.8	NW	Air, Ground Water, Noise, Soil
8.	Umngot River (Upstream)	1.0	E	Surface Water
9.	Umngot River (downstream)	1.0	SE	Surface Water



1.3.1 LAND ENVIRONMENT**1.3.1.1 Soil Quality**

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

- pH was found to be in range of 7.25-7.60.
- Soil Conductivity was found to be in the range of 372 to 484.2 $\mu\text{mhos/cm}$
- Nitrogen as N was found to be in the range of 0.019 to 0.041 Kg/ Hectare
- Phosphorus as P was found to be in the range of 10.67 to 14.3 mg/kg

1.3.2 WATER ENVIRONMENT**Ground Water**

Seven ground water samples and two surface water samples have been considered in the study area. The analysis results are as given below:

- pH was found to be in range of 7.26-7.78.
- TDS was found to be in the range of 312-500 mg/l.
- Hardness was found to be in the range of 156-189 mg/l.
- Fluoride was found to be in the range of 0.18 - 0.27 mg/l.

Other parameters like Calcium, Magnesium, Chlorides, Sulphates and Nitrates were found within the prescribed limits. The physico – chemical analysis for the other parameters were also within the permissible limits as per the standards as per IS: 10500. The water quality is potable in nature.

Surface Water

- pH of the surface water was found to be in range of 7.36 to 7.59.
- DO were found in range of 7.3 to 7.6 mg/l
- BOD were found in range of BDL(<2.0)
- COD were found in range of 15 to 18 mg/l

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} , $\text{PM}_{2.5}$, NO_x , SO_2 and CO) at seven representative ambient air quality monitoring stations.



Ambient Air Quality

Ambient air quality monitoring has been carried out with a frequency of two days a week at seven locations covering one complete season i.e. October 2023 to December 2023. Various statistical parameters like 98th percentile, average, maximum and minimum values have been computed from the observed raw data for all the AAQ monitoring stations. These are compared with the standards prescribed by Central Pollution Control Board (CPCB) for rural and residential zone.

The observation based on the perusal of the results is summarized below:-

PM10:-The maximum value for PM10 observed at Mine Site 87.48 $\mu\text{g}/\text{m}^3$ and minimum value for PM10 observed at Umwai 61.64 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit for Industrial, Residential Rural and Other Areas is 100 $\mu\text{g}/\text{m}^3$.

PM2.5:-The maximum value for PM2.5 observed at Mine Site 48 $\mu\text{g}/\text{m}^3$ and minimum value for PM2.5 observed at Umwai 24.61 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit for industrial, Residential Rural and Other Areas is 60 $\mu\text{g}/\text{m}^3$.

SO2:- The maximum value for SO2 observed at Mine site 11.04 $\mu\text{g}/\text{m}^3$ and minimum value for SO2 observed at Umsaw 5.2 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit for industrial, Residential Rural and Other Areas is 80 $\mu\text{g}/\text{m}^3$.

NOx:-The maximum value for NO2 observed at mine site - 20.27 $\mu\text{g}/\text{m}^3$ and minimum value for NO2 observed at Umwai 10.81 $\mu\text{g}/\text{m}^3$. The 24 hours applicable limit for industrial, Residential Rural and Other Areas is 80 $\mu\text{g}/\text{m}^3$.

CO:- The maximum value for CO observed at Mine Site-1.45 mg/m^3 and minimum value for CO observed at Sohbar 0.24 mg/m^3 . The 8 hours applicable limit for Industrial, Residential Rural and other areas is 2.0 mg/m^3 .

Conclusion: The results of the monitored data indicate that the ambient air quality of the region in general conforms to the norms of National Ambient Air Quality standards of CPCB, at all locations monitored.

1.3.4 NOISE ENVIRONMENT

The noise monitoring has been conducted for determination of noise levels at seven 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.

RESULT

A) Day time Noise Levels L_{eq} (day)



The day time Leq (day) noise levels at all locations were observed to be in the range of 50.4-58.4 dB (A). The maximum noise level of 58.4 dB (A) was observed at Mine site and the minimum noise level of 50.4 dB (A) was observed at Nongjri War during the study period. It is observed that the day time noise levels are in accordance to the prescribed limit of 75dB (A) in the study area.

B) Night time Noise Levels Leq (night)

The night time L_{eq} (night) noise levels at all the residential locations was observed to be in range of 36.2-42.5 dB (A). The maximum noise level of 42.5 dB (A) was observed at Umsaw and the minimum noise level of 36.2 dB (A) at Nongjri War during the study period. It has been found that the night time noise levels at Mine Site were found to little very high due to vehicular movement, within the prescribed standard of 70 dB(A).

1.3.5 SOCIO-ECONOMIC ENVIRONMENT

The study area encompasses the project site and a 10 km radius around it, covering five tehsils: Pynursla, Shella Bholaganj, Myllem, Mawphlang, and Khatarshnong Laitkroh, including 53 villages. There are 3,879 households, averaging five members each. Of these, 4.92% are within 0-2 km, 41.48% within 2-5 km, and 53.60% within 5-10 km. The total population is 19,716, with 5.31% living in the 0-2 km range, 41.76% in 2-5 km, and 52.93% in 5-10 km. Among them, 51.45% are male and 48.55% are female, resulting in a sex ratio of 944 females per 1,000 males. The child population aged 0-6 years accounts for 19.74%, with a sex ratio of 923 girls for every 1,000 boys.

SOCIAL STRUCTURE

In the study area, the Scheduled Caste community comprises 1.53% of the total population, with 1.49% male and 1.58% female, resulting in a sex ratio of 999 females for every 1,000 males. Meanwhile, the Scheduled Tribe community accounts for only 1.78% of the population, with 77.42% male and 78.86% female, leading to a sex ratio of 961 females for every 1,000 males.

LITERACY STATUS OF THE STUDY AREA

In the study area, 55.58% of the total population is literate, with 55.96% male and 55.18% female, indicating room for improvement in girls' and women's education. Conversely, 45.99% of the population is illiterate, consisting of 37.16% males and 55.86% females.



WORKER'S PROFILE & OCCUPATIONAL STRUCTURE

The overall work participation rate in the study area is 39.06%, with 50.74% of males and 24.61% of females participating in the workforce. Among workers, 31.47% are classified as main workers and 6.58% as marginal workers. Most men are involved in small industries, agriculture, and labor, while women primarily work as marginal workers due to household responsibilities, with many also cultivating their agricultural lands.

1.3.6. BIOLOGICAL ENVIRONMENT

The biological environment of Meghalaya, encompassing diverse terrestrial and aquatic ecosystems, is assessed for environmental impact to protect flora and fauna. The state's 22,429 km² area includes 8,514 km² of forests, with 722.36 km² under direct State Forest Department control. Forest types are classified as tropical, subtropical, and temperate, with variations including evergreen, semi-evergreen, moist and dry deciduous, and grasslands. The temperate forests occur at higher elevations, while grasslands result from deforestation. As of 2001, Meghalaya's forest cover is 15,584 km², about 69.5% of the state's area, with significant portions managed by local councils and traditional institutions.

Floral Diversity in Study Area

Study Area
Flora
Climbers –19 Species
Herbs – 40 Species
Shrubs - 70 Species
Tree – 74 Species
Orchids- 8 Species
Fauna
Reptiles - 9 Species
Butterfly/ Moth –28 Species
Mammals –15 Species
Avifauna-79 species

Aquatic Ecology (Phytoplankton and Zooplankton)

Phytoplankton

Study Area



Cyanophyceae- Blue green algae - 06 Species

Cholorophyceae- Green Algae - 12 Species

Euglenophyceae /Flagillates – 02 Species

Bacillariophyceae-Diatoms – 11 Species

Zooplankton

Rotifers and cladocera larvae were chief component of zooplanktonic communities that serves as fish food.

The taxa observed at different sites of Umngot River were *Rotaria sp*, *Brachionus spp*, *Fillinia sp.*, *Keratella sp.* (Rotifers) and *Bosmina sp.* (Cladocera). In case of zooplankton, a total 25 taxa were observed in all the three stations.

Taxa at different sites of Umngot river

Protozoa - 05 species

Rotifera - 09 species

Copepoda - 03 species

Cladocerans - 06 Species

Ostracods - 02 Species

Out of these 25 taxa, 5 taxa belong to class Protozoa, 9 belong to class Rotifera, 3 belongs to Copepoda, 6 belongs to Cladocerans and 2 from Ostracos. Rotifera was most abundant group.

Macro-Invertebrates

Benthic invertebrates are vital in riverine and wetland ecosystems, linking primary producers to higher consumers. They serve as indicators of environmental changes and water quality, with species richness affected by water conditions.

Macro benthos Invertebrate fauna in the Study Area

Ephemeroptera - 10 Species

Odonata - 01 Species



Diptera - 02 Species

Hemiptera - 02 Species

Molluscan - 02 Species

Nektons (Fish community)

Umngot River has 16 fish species from 7 families, with 50% from Cyprinidae, indicating low ichthyofaunal diversity. The limited diversity is due to river morphology and land use. Six species were observed in the project's influence area.

During the biodiversity assessment and concern with local stakeholder revealed that the project study area does not fall in migration route of migratory Birds. On the other hand, none of significant fauna present in core zone project area and no habitation of significant wild life in core zone of project. All the floral and faunal species reported from the core zone are common and widely distributed in the buffer zone also. So, it can be stated that the project and associated activities are unlikely to influence any floral and faunal components significantly provided that the suggestions/recommendations in this report are implemented. Strict implementations of EMP/ mitigation measures are required to ensure that the biodiversity of the study area should not impacted negatively.

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: -

Soil Environment		
Aspects	Impact	Mitigation Measures
Geomorphology	Mining alters landforms, creates voids, and disrupts terrain.	Implement land reclamation, minimize disturbance, control erosion, manage water effectively, protect biodiversity, engage with the community, and monitor restoration efforts.
Soil Erosion and Degradation	Mining disturbs soil, leading to erosion and compaction.	Construct garland drains and siltation ponds, plant vegetation, reduce heavy machinery use in wet conditions, and apply soil amendments for reclamation.



Project:- “Rikaleng Limestone Mine”	
Applicant:- Smt Kuntimai Tangdhara	Executive Summary

Deforestation and Habitat Destruction	Mining causes deforestation and disrupts ecosystems.	Conduct plantation in statutory barriers, around infrastructure, and unworked areas; ensure more than 33% of the lease area is replanted by the end of mining.
Visual Impact and Aesthetic Degradation:	Mining alters landscapes and scenic views.	Establish landscaping and vegetation buffers to minimize visible disturbance
Change in Topography, Sinkholes, and Subsidence	Mining creates land subsidence and alters drainage patterns.	Confine impacts to the lease area, focus on careful planning, reclamation, phase-wise plantation, and develop water reservoirs.
Earthquake Zone V	Mining in high-risk areas poses significant environmental harm.	Implement strict environmental controls, advanced technology, and comprehensive monitoring; maintain bench slopes as per the mining plan and conduct slope stability studies.
Removal of Soil Cover and Waste Generation:	Mining generates significant waste and soil.	Manage waste through proper dumping, stabilize waste dumps with retaining walls, and use extracted soil for plantation to avoid permanent stockpiles.

Water Environment

Ground Water

Groundwater table intersection and depletion; changes in aquifer properties.	Mining may intersect and contaminate groundwater, and affect aquifer properties.	Pit limits are set to avoid groundwater. Water needs is being/will be met through tanker supply from nearby water streams, not groundwater. Post-mining, natural recharge will be restored, and groundwater quality will be regularly monitored.
Sewage from septic tanks and soak pits.	Sewage could percolate and contaminate groundwater.	Sewage is being/will be managed with septic tanks and soak pits. Stabilized sludge is being/will be used for plantation.
Leaching of chemicals and heavy metals.	Leaching from mine wastes could contaminate groundwater.	No chemicals or heavy metals is being/will be used. Proper tailings management, containment liners, and effective water management is being/will be enforced. Regular monitoring will ensure groundwater protection.



Project:- “Rikaleng Limestone Mine”	
Applicant:- Smt Kuntimai Tangdhara	Executive Summary

Surface Water

Contamination of nearby water bodies.	Runoff may carry sediments and chemicals, potentially degrading water quality and harming aquatic life.	No chemicals or heavy metals is being/will be used. Water management plans will effectively manage runoff through the use of containment ponds and sedimentation facilities
Alteration of hydrology.	Mining can alter drainage patterns and reduce downstream water availability, affecting ecosystems.	Natural drainage will remain unaffected. Post-mining restoration will return the area to its original condition. Rainwater is being/will be managed and utilized, with erosion control measures in place to protect water quality.

Air Environment

Emissions from heavy machinery and transport vehicles	Emission of pollutants (NOx, SO2, VOCs) contributes to air pollution.	Equip machinery with modern emission controls, perform regular maintenance, and reclaim disturbed areas with vegetation to stabilize soil and reduce dust. Engage local communities in air quality management plans.
Dust and pollutants from mine sites	Dust and pollutants escaping from mine sites contribute to air pollution.	Reclaim disturbed areas with vegetation to stabilize soil and reduce dust. Involve and inform local communities in air quality management plans to address concerns and improve transparency.

Noise Environment

High Noise Levels	Disturbs workers, nearby communities, and wildlife.	Construct noise barriers, maintain equipment, use anti-vibration mounts, schedule noisy activities during less sensitive times, implement noise reduction technologies, plan controlled blasting, and ensure smooth haul roads.
Continuous Operation	Sustained noise pollution from conveyor belts and crushers.	Regular maintenance of machinery, limit truck speeds, install silencers in equipment, and provide closed cabins for operators
Health Effects	Hearing loss, stress, sleep disturbances,	Provide hearing protection, implement administrative controls, rotate tasks, carry out



Project:- “Rikaleng Limestone Mine”	
Applicant:- Smt Kuntimai Tangdhara	Executive Summary

	and disruption of animal behavior.	perimeter plantation, conduct regular health checkups, and perform periodical noise monitoring.
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Socio-Economic Environment

Negative Impacts & Mitigation

Social Challenges	Increased population and economic activity can strain local social services and infrastructure.	Partnerships will be developed with local governments and NGOs to enhance social services. Community development programs to address social challenges will be implemented.
Cultural Impact	Mining operations can disrupt traditional lifestyles and cultural practices of indigenous or local communities	Local communities will be engaged in culturally sensitive planning and decision-making processes. Cultural preservation initiatives will be supported and local traditions respected.
Community Health	mining activities can include issues such as air and water pollution, noise pollution, increased risk of respiratory diseases, potential exposure to hazardous chemicals, and disruption of access to clean water sources	Regular health check-up of workers and nearby locals is being/will be conducted. Records of the worker's health and safety is being/will be maintained. Training is being/will be provided to the workers. Personal Protective equipment's is being/will be provided to workers. The safety and well-being of workers is being/will be ensured in accordance with mining rules and regulations.
Human Settlement	Mining projects can also cause, displacement, increased crime, economic inequality, infrastructure strain, and long-term legacy problems, significantly impacting nearby	Nearest settlement is 2.3 km away in SSW. (Village - Umsaw). There is no physical or economic displacement due to the project and also not predicted in future also. Mitigation measures for nearby human settlements include, investing in community health and infrastructure, ensuring fair economic benefits, involving local communities in decision-making etc.



Project:- “Rikaleng Limestone Mine”		
Applicant:- Smt Kuntimai Tangdhara		Executive Summary
	human settlements and their quality of life.	
Positive Impacts		
<p>Income and Revenues</p> <ul style="list-style-type: none"> Enhancement of average income for locals engaged in similar mining activities directly and indirectly. Increase in tax revenues of local and central government. Successful operation of the plant will attract additional industrial investments, benefiting both society and the nation. 		
<p>Livelihoods</p> <ul style="list-style-type: none"> Approximately 21 No. of people will get directly employed from the mining project. Anticipated creation of new direct and indirect employment opportunities. Expected increase in non-agricultural livelihood opportunities, both directly and indirectly related. The minimal influx of personnel is expected during the operational phase. 		
<p>Physical Infrastructure</p> <ul style="list-style-type: none"> The road and power networks in the area are expected to be strengthened as part of sequential development. 		
Biological Environment		
<ul style="list-style-type: none"> Clearing of Vegetation Noise and Vibration from Mining Activities Discharge of Polluted Water Dust Generation Removal of Vegetation for Excavation. 	<ul style="list-style-type: none"> Deforestation, disturbance to wildlife, and degradation of aquatic flora and fauna. Displacement of animals and birds, disturbance to local wildlife. Degradation of aquatic flora and fauna. Impact on nearby vegetation and 	<p>Conduct Assessments: thorough EIA report has been prepared to understand potential impacts and design appropriate mitigation measures.</p> <p>Avoid Sensitive Areas: The mining lease is situated on private land, and there are no national parks or wildlife sanctuaries within a 10-kilometer radius of the lease area. Therefore, the likelihood of impacting sensitive areas is minimal.</p> <p>Species Surveys: A survey has been conducted to determine the presence of any Schedule I species or sensitive flora and fauna within the study area. There is not any sensitive flora fauna or schedule 1 species found in the study area.</p> <p>Restoration Plans: Develop plans for ecosystem restoration and use native species for replanting.</p>

Project:- “Rikaleng Limestone Mine”		
Applicant:- Smt Kuntimai Tangdhara		Executive Summary
	<p>biological environment.</p> <ul style="list-style-type: none"> • Loss of flora and potential disruption to the local ecosystem. 	<p>Water and Air Management: Control water contamination and air pollution through proper management and monitoring.</p> <p>Safe Disposal: Handle mining waste responsibly and explore recycling opportunities.</p> <p>Soil Stabilization: Implement erosion control methods like silt fences and vegetation planting.</p> <p>Stakeholder Involvement: Engage with local communities and address their concerns through education and feedback.</p> <p>Continuous Monitoring: Track environmental impacts and report on compliance with mitigation measures.</p> <p>Adhere to Regulations: Follow environmental regulations and permit requirements</p>

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 is provided. Toilets and urinals are provided near the mine site. Drinking water is being/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 Limestone (minor minerals). The following types of hazards are identified during the limestone 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 limestone 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 limestone. The capacity of mine is 2,07,825 TPA ROM aiming to fill the demand – supply gap.



This limestone mining is being/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.

- At the end of life of mine, total excavated area will be of 2.00 Ha.
- 0.05 ha of the total leased area are already under plantation.
- Total 100 saplings will be planted over an area of 0.10 ha in next five year of mining (33% of lease area).
- Additionally, 1.33 ha area will be planted with 1,330 trees at the upper benches of excavated pit and 0.10 ha. over the waste dump till the end of life of mine. Thus, at the conceptual stage total area covered under greenbelt will be 1.58 ha. along with 1580 trees.

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 is being/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 is being/will be maintained uniform.
- Regular pollution checks and certification of vehicles is being/will be done.
- Limited number of mine-related vehicle is being/will be maintained on the public roadways to reduce the traffic to minimize impacts on local people.
- The loaded vehicles is being/will be covered with tarpaulin during transportation.
- Over loading is being/will be avoided and free board is being/will be left in the loaded trucks to prevent spillage.
- The roads is being/will be maintained.
- Regular cleaning is being/will be done to reduce the chances of road dust to become airborne.
- Water sprinkling is being/will be done on a fixed stretch of paved road.
- Natural barriers is being/will be developed along the roadside to control the dispersion of dust particles.
- Speed breakers is being/will be constructed to restrict the speed of transporting vehicles. However, limiting of vehicular speed is being/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 is being/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 is being/will be performed to ensure efficiency and worn parts is being/will be replaced.
- The vehicles is being/will be maintained in good condition and overloading will not be done.
- Speed limits is being/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 is being/will be provided to workers, working in high noise areas.
- Periodical medical checkup is being/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 is being/will be conducted.
- Awareness program is being/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.
- The project is being providing employment to 21 people. More employment opportunities will create in future from the project.
- Employment opportunities is being/will be provided, along with periodic training to develop work skills preferring local candidates.
- Regular health camps is being/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 existing project is not likely to affect the environment or adjacent ecosystem adversely. The Senior 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.

