EXECUTIVE SUMMARY

1 INTRODUCTION

The "Nonglynrong Limestone Mine" located at Nonglynrong, Elaka Nongtalang, District West Jaintia Hills, Meghalaya. The total lease area of the project is 3.40 Ha. The mining activities are being/will be carried out by open cast semi-mechanized method.

The project activity is listed at item 1(a) B1 Mining of Minerals in Schedule of EIA Notification, 2006 and subsequent amendments thereafter as category "B1" project and hence require prior Environmental Clearance.

However, as per the EIA Notification No. S. O. 3977 (E) dated 14th August' 2018 for Sand Mining and other Minor Mineral Mining projects in Cluster situation having Cluster area of Mine leases > 5 ha and < 25 ha with no individual lease > 5 ha comes under category "B2" and public hearing is not required for appraisal of EC.

As per the Ministry of Environment, Forest & Climate Change Office Memorandum dated 12th December, 2018 "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". The total cluster area is 18.64 Ha.

1.1 LOCATION OF LEASE AREA

The mining lease is located at Nonglynrong, Elaka Nongtalang, District West Jaintia Hills, Meghalaya. The mining lease area is 3.40 ha.

1.2 DETAIL OF MINING LEASE

S. No.	Particulars	Details
1.	Name of Project	Nonglynrong Limestone Mine
2.	Location	Nonglynrong, Elaka Nongtalang, District West Jaintia Hills, Meghalaya
3.	Lease Area	3.40 Ha.
4.	Land Type	Private Owned Land
5.	Seismic Zone	zone V very high damage risk zone (MSK IX or more) category

2 PROJECT DESCRIPTION

The Letter of Intent (LOI) for mineral Limestone, Area: 3.40 hectare was sanctioned in favour of Smt. Aldrina Nonglamin by Office of Divisional Forest Officer (Territorial) Jaintia Hills Division, Jowai vide its letter No. JH/MMMCR-2016/2016-17/869/B/1113 dated 09.08.2022.

Subsequently, the Mining Lease was granted to Smt. Aldrina Nonglamin by the Divisional Forest Officer, Jaintia Hills Territorial Division, Jowai, vide order no. JH/AN/ML/LS/2018-19/964/B/239 dated 18.04.2018.

The Mining Plan with PMCP was approved by the Mining Engineer, Directorate of Mineral Resources Meghalaya: Jowai vide order no. DMO-J/95/MM/M-Scheme/LS/2024-25/08 dated 27.05.2024 in favour of Smt. Aldrina Nonglamin.

The mineable reserve is about 12,55,260 MT to produce limestone at the rate of 2,22,225 TPA of ROM (Mineral Limestone- 2,00,000 TPA & Mineral Waste- 22,225 TPA). The mining operations are being/will be carried out by open cast semi - mechanized method.

2.1 GEOLOGY

2.1.1 Local Geology

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

Table 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 27.05.2024

2.1.2 Physiography

The elevation range within the lease area is 723mRL highest contour to 675mRL lowest contour. The mineral is exposed in the whole lease area. Drainage in the lease area is almost Southerly. General drainage outside the area is almost Southeasterly by non-perennial nalahs. The area is hilly and stony.

2.2 GEOLOGICAL AND MINEABLE RESERVES

Details are as follows: -

Table 2 UNFC Classifications of mineral reserves

A) Total Mineral Reserves	Limestone (Tonnes)
Proved Mineral Reserves	11,54,930
Probable Mineral Reserves	1,00,300
Total Mineable Reserves	12,55,260
B) Total Remaining Resources	**Limestone (Tonnes)**
Feasibility Mineral Resources	13,82,170
Pre-Feasible Mineral Resources	21,35,300
Inferred Mineral Resources	7,44,525

Life of Mine	= Minable Reserves (Tonnes)/Average Production (Tonnes)
	= 12,55,230 /2,00,000 = ~ 6.27 Yrs. = 07 Years

2.3 MINING

Opencast method of mining with semi mechanization is being/will be proposed to excavate the mineral and waste and for other mining activities. The salient features of mode of working as per approved Mining Plan with PMCP are: -

- 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.
- In the period of this Mining Scheme the lessee will develop nine benches i.e. From Bench levels 714mRL (Top bench), 708mRL, 702mRL, 696mRL, 690mRL, 684mRL, 678mRL, 672mRL and 666mRL, (Bottom Bench).
    - The bench slope is being/will be maintained 85°. The loading of mineral is directly from pits or from temporary stack yard.
- 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 '1' and will be used for plantation in monsoon
- 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.
- 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.

2.4 PRODUCTION DETAILS

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

Table 3 Production Details

Year	Tentative Excavation in Tons (ROM)	Waste/Sub Grade of Limestone in Tons	Mineral Limestone in Tons
First Year	2,22,225	22,225	2,00,000
Second Year	2,22,225	22,225	2,00,000
Third Year	2,22,225	22,225	2,00,000
Forth Year	2,22,225	22,225	2,00,000
Fifth Year	2,22,225	22,225	2,00,000
Total	**11,11,125**	**1,11,125**	**10,00,000**

Source-Approved Mining Plan with PMCP 27.05.2024

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 4 Land Use Pattern

S. No	Land use Category	Present (Ha)	End of 5th year (Ha)	End of mine (Ha)
1.	Top Soil Dump	--	0.010	--
2.	Waste Dump	--	0.100	0.100 (Reclaimed by plantation)
3.	Excavation (voids Only)	2.100	2.188	2.228 (Plantation on upper benches – 0.80 ha & Water Reservoir-1.428 Ha)
4.	Roads	--	0.020	--
5.	Buildup Area	--	0.010	--
6.	Township Area	--	--	--
7.	Afforestation	0.050	1.072	1.072
8.	Reclamation (Backfilled)	--	--	--
9.	Mineral Storage	--	--	--
10.	Processing (Crushing)	--	--	--

11.	Undisturbed area	1.250	--	--
Total		**3.400**	**3.400**	**3.400**

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 ten locations in the study area. The baseline data has been collected in the Post monsoon season (Oct' 2023 to Dec' 2023). The detail of the sampling locations is given in below:-

Table 5 Sampling Location

S. No.	Sampling Location	Distance (Km)	Direction	Components
1.	Mine Site (Smt. Aldrina Nonglamin)	--	--	Air, Ground Water, Noise, Soil
2.	Amjajer Roko	1.7	ENE	Air, Ground Water, Noise, Soil
3.	Amsohtai	4.5	SE	Air, Ground Water, Noise, Soil
4.	Nongtalang	2.7	SW	Air, Ground Water, Noise, Soil
5.	Lamin	5.7	WSW	Air, Ground Water, Noise, Soil
6.	Amtapoh	3.0	NNW	Air, Ground Water, Noise, Soil
7.	Umngot River (Upstream)	6.5	WSW	Surface Water
8.	Umngot River (downstream)	7.2	WSW	Surface Water

3.1 LAND ENVIRONMENT

3.1.1 Soil Quality

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

pH	:	7.29 to 7.64
Soil Conductivity	:	326 to 508 µmhos/cm
Available Nitrogen	:	0.02 to 0.03 Kg/ Hectare
Phosphorus as P	:	10.84 to 14.3 mg/kg

3.2 WATER ENVIRONMENT

3.2.1 Ground Water

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

The analysis results indicate that pH of the groundwater was found to be in range of 7.18-7.89. The TDS were found to be in the range of 302-390 mg/l. Other parameters like

Calcium, Magnesium, Chlorides, Sulphates and Nitrates were found exceed the limits 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 non-potable in nature.

3.2.2 Surface Water

The analysis results indicate that pH of the surfacewater was found to be in range of 7.48 to 7.51. The COD and DO were found in range of 12 to 14 mg/l and 7.1 to 7.5 mg/l respectively.

3.3 AIR ENVIRONMENT

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

3.3.1 Ambient Air Quality

Ambient air quality monitoring has been carried out with a frequency of two days a week at eight locations covering one complete season i.e. Oct' 2023 to Dec' 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:-

PM_{10}:-The maximum value for PM_{10} observed at Mine Site 78.5 µg/m^3 and minimum value for PM_{10} observed at Nongtalang 42.12 µg/m^3. The 24 hours applicable limit for Industrial, Residential Rural and Other Areas is 100 µg/m^3.

PM2.5:-The maximum value for PM2.5 observed at Mine Site 33.53 µg/m3 and minimum value for PM2.5 observed at Nongtalang 18.07 µg/m3. The 24 hours applicable limit for industrial, Residential Rural and Other Areas is 60 µg/m3.

SO2:- The maximum value for SO2 observed at Lamin 15.89 µg/m3 and minimum value for SO2 observed at Mine site 3.8 µg/m3. The 24 hours applicable limit for industrial, Residential Rural and Other Areas is 80 µg/m3.

NOx: -The maximum value for NO2 observed at Amsohtai - 20.55 µg/m3 and minimum value for NO2 observed at Mine site 5.39 µg/m3. The 24 hours applicable limit for industrial, Residential Rural and Other Areas is 80 µg/m3.

CO: -The maximum value for CO observed at Mine Site-1.54 mg/m3 and minimum value for CO observed at Nongtalang 0.36 mg/m3. The 8 hours applicable limit for Industrial, Residential Rural and other areas is 2.0 mg/m3.

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

3.4 NOISE ENVIRONMENT

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

Table 6 Ambient Noise Level Status

Location	Date of Sampling	Day Time (6.0 AM to 10.0 PM)	Night Time (10.0 PM to 6.0AM)
Mine Site	08.10.2023	58.8	42.6
Amjajer Roko	24.10.2023	53.1	41.5
Amsohtai	05.10.2023	52.4	38.2
Nongtalang	04.11.2023	50.7	40.1
Lamin	18.11.2023	52.2	43.4
Amtapoh	23.11.2023	53.0	42.8
Standards			
Category of Area/ Zone		**Day Time**	**Night Time**
Industrial Area		75	70
Commercial Area		65	55
Residential Area		55	45
Silence Zone		50	40

3.5 SOCIO-ECONOMIC ENVIRONMENT

The study area includes the 34 Villages at Nonglynrong, Elaka Nongtalang, District West Jaintia Hills, Meghalaya within 10 km of area from mining lease periphery.

In the study area, there are 3,124 households distributed as follows: 5.22% are located within 0 to 2 km, 43.31% are within 2 to 5 km, and 51.47% are within 5 to 10 km. The total population of the project area is 17,000, with 5.50% residing within 0 to 2 km, 43.24% in the 2 to 5 km range, and 51.26% in the 5 to 10 km range.

The male population makes up 49.52% of the total, while females account for 50.48%. The sex ratio in the 10 km study area is 1,019 females per 1,000 males. The average family size is approximately 4 to 5 members. The population of children aged 0-6 years represents 19.11% of the total population, with a sex ratio of 982 females per 1,000 males in this age group.

3.5.1 SOCIAL STRUCTURE

In the study area, the Scheduled Caste (SC) population constitutes 1.30% of the total population, which amounts to 221 individuals. The sex ratio for the SC population is 922 females per 1,000 males.

The Scheduled Tribe (ST) population makes up 95.21% of the total population, totaling 16,186 individuals. The sex ratio for the ST population is 1,033 females per 1,000 males.

3.5.2 LITERACY STATUS OF THE STUDY AREA

In the study area, individuals aged seven years and above who can both read and write with understanding in any language are classified as literates. There are 9,790 literate individuals in the area, which constitutes 57.59% of the total population. Among these, 55.73% are male literates and 59.42% are female literates, relative to the total male and female populations, respectively.

Conversely, there are 7,210 illiterate individuals in the study area, making up 45.99% of the total population. Of these, 37.16% are male illiterates and 55.86% are female illiterates, relative to the total male and female populations.

3.5.3 WORKER'S PROFILE & OCCUPATIONAL STRUCTURE

In the study area, 7,675 individuals are engaged in work, representing 45.15% of the total population. Of these workers, 52.99% are male and 37.45% are female, based on the total male and female populations, respectively.

Among the working population, 29.66% are involved in main work, while 15.48% are engaged in marginal work. Main work participation is predominantly male, with males accounting for 39.65% of this group. Marginal work participation shows a higher

proportion of females, with 17.58% of the total engaged in marginal work compared to 13.34% of males.

Males are mainly employed in small industries, agriculture, and labor. In contrast, women primarily take on marginal roles due to their domestic responsibilities, with many working as marginal cultivators in their fields.

3.6 BIOLOGICAL ENVIRONMENT

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 proposed 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.

Table 7 Flora and Fauna Present in Buffer Zone

Buffer Zone
Flora
Climbers –**19** Species
Herbs – **40** Species
Shrubs - **70** Species
Tree – **74** Species
Fauna
Reptiles - **9** Species
Butterflies –**28** Species
Mammals –**15** Species
Avifauna**-79** species

4 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

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

Impact	Mitigation Measures
Land Environment	
Landforms alteration, Mountain top removal, creation of void.	Mitigation measures for mining impacts include land reclamation, minimizing disturbance, erosion control, effective water management, biodiversity protection, community engagement, and regular monitoring of restoration measures during and post-operation phase.
Mining operations leads to disturbance of soil structure leading to erosion, loss of fertility, and compaction.	Garland Drains & siltation ponds will be constructed around the mine pit & waste dump area to prevent soil erosion by flowing water. Techniques such and planting vegetation will be implemented to prevent erosion of soil by air & water and restore the natural landscape. Reducing the use of heavy machinery during wet condition suggested, it will help to prevent soil compaction. Soil amendments and reclamation practices to restore soil quality will be adopted.
Mining projects often lead to significant deforestation and habitat destruction by clearing vast areas of forest for extraction. This disrupts ecosystems, displaces wildlife, and reduces biodiversity. Additionally, the construction of infrastructure and waste disposal further exacerbates environmental damage.	33% of lease area will be covered under plantation in first 5 year of mining in statuary barrier, near rest shelter, site office & unworked area within the mining lease. Also, the waste dump area (0.10 ha) & upper bench area (0.80 ha) will be reclaimed by growing plantation around it.
Mining projects results in alteration of natural landscapes and scenic views.	Landscaping and vegetation buffers will be established, and mining operations will be designed to minimize visible surface disturbance in sensitive areas.
Mining activities will lead to alterations such as land subsidence, creation of large excavations or pits, and modification of natural drainage patterns & potentially	The topography of the lease area comprises of hilly terrain. There will be change in the topography of the lease area but the impact on the physical environment will be confined within the mine lease area only.

affect surrounding habitats and communities.	Efforts will be focused on careful planning, reclamation, and restoration measures to minimize long-term environmental consequences. 33% of lease area will be covered under plantation which will enhance the scenic views & environment. The total excavated area 2.228 ha will be used as a water reservoir at the end of mine life. Filling of sinkholes can restore surface stability, restoring natural drainage patterns, and replanting vegetation to restore the area's natural water balance.
The high damage risk zone, indicates that mining activities in this area can pose greater harm to the land environment.	Stringent environmental controls, advanced technology for minimizing ecological impacts, and comprehensive monitoring and post-mining restoration efforts will be implemented effectively. The bench slope will be maintained 85°as suggested in the approved mining plan. Minimum bench width will be equal to height of bench. Slope study analysis will be conducted in regular intervals.
There will be generation of Soil/Overburden & Mineral waste of considerable amount during the course of mining, so there will be a challenge regarding its management and disposal.	Total 1,11,125 tons of waste will come across during next five-year plan period and total 1,93,280 tons till the end of mine life. The waste is being/ will be dump 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 waste dump will be stabilized by retaining walls of rubble stone. Parapet wall and drain will also be constructed towards lower altitude side to check the wash-off during monsoon. No separate soil is observed in the applied lease area. The soil that may come across during mining in patches or in cavities will be scraped and stacked separately in 0.01 ha area near pillar '1' and to be used for plantation

	in monsoon & land reclamation.
Water Environment	
Ground Water	
Mine workings may intersect ground water table which may result in ground water contamination. Abstraction of ground water for mining operations may lead to depletion of water table. Also the mining operations Can affect the porosity and permeability of aquifer.	The ground water table will not be encountered during entire working period of mining. The water requirement for the project is 5.0 KLD, which is being/will be met through tanker supply from nearby water streams. Hence, no ground water is being/will be used for mining operations. After completing mining operations, efforts should be made to restore the natural recharge capabilities. Regular monitoring of groundwater quality to detect any changes in chemical composition will be carried out.
The sewage from soak pit may percolate to the ground water table and contaminate it.	The daily sewage generation will be 1.0 KLD, which is being/will be disposed of in septic tank and soak pit. Stabilized sludge is being/will be used as manure for plantation.
Surface Water	
Contamination of nearby rivers, streams, and lakes due to runoff from mine site carrying sediments, heavy metals, and chemicals can degrade water quality, harm aquatic life, and affect downstream users.	In this limestone mining operation, no chemicals or heavy metals will be used or generated. Consequently, there is no risk of these substances being carried into nearby water bodies through surface runoff. Comprehensive water management plans will be developed to control runoff and manage water quality. Containment ponds, liners, and treatment facilities, such as sedimentation ponds, will be utilized to capture and treat water before discharge.
Construction of mining infrastructure and changes in land use can alter natural drainage patterns and flow regimes which can disrupt aquatic habitats, reduce water availability at downstream, and affect ecosystems dependent on stable water	Natural drainage outside the lease area will remain unaffected by mining activities inside. The lease area will be restored to its original condition to the greatest extent possible after mining operations are completed. However, during mining operations, surface runoff in the form of rainwater will occur only during the monsoon

flows.	season. No water from the quarry will be directly discharged into any natural water course. Accumulated rainwater will be partially utilized for dust suppression and afforestation. Given limestone's permeable nature, much of the water will percolate below the quarry surface. Rainwater will follow the natural topography of the lease area. Erosion control mexasures, including re-vegetation, construction of garland drains, and siltation ponds, will be implemented to minimize sediment runoff and safeguard water quality.
Air Environment	
Heavy machinery and transport vehicles emit pollutants such as nitrogen oxides (NOx), sulfur dioxide (SO2), and volatile organic compounds (VOCs).	Heavy machinery and transport vehicles is being/will be equipped with modern emission control technologies. Regular maintenance and servicing of these is being/ will be carried out.
Dust & pollutants can escape from mine sites, contributing to air pollution.	Disturbed areas will be reclaimed with vegetation to stabilize soil and reduce dust emissions. Local communities will be informed and involved in air quality management plans to address concerns and enhance transparency.
Noise Environment	
Mining activities, including drilling, blasting, and heavy machinery operation, generate high noise levels that can disturb mine workers, nearby communities and wildlife.	Barriers or acoustic enclosures around noisy equipment to reduce noise transmission is being/will be constructed. Drilling equipment's is being/will be regularly maintained as per maintenance manual. Anti-vibration mounts for compressors will be provided. Each blast will be carefully planned, checked and executed under the supervision of statutory personnel. Noisy activities are being/will be scheduled during less sensitive times and noise reduction technologies in equipment is being/will be implemented.

	Compact and leveled haul road are proposed for smooth running of transport vehicles. Optimum parameters for drilling and blasting will be designed to have controlled blasting which will reduce noise and vibrations. Blasting will be carried out during day time and not on cloudy days.
Ongoing operations, such as conveyor belts and crushers, contribute to sustained noise pollution.	Regularly maintain and service machinery to ensure it operates efficiently and minimizes unnecessary noise. Speed of trucks will be limited to prevent undue noise from empty trucks. Adequate silencers in HEMM are provided to reduce generation of noise. All HEMMs is being/will be equipped with closed cabins for operators.
Prolonged exposure to high noise levels can cause hearing loss, stress, and sleep disturbances in humans, and may also disrupt animal behavior and communication.	Hearing protection equipment for workers is being/will be provided and administrative controls to limit exposure to high noise levels will be implemented. Task rotation of workers is being/will be done to reduce exposure to high noise level. Plantation is being/will be carried out along the periphery of the lease area. The plantation minimizes propagation of noise and also arrests dust. Regular health checkup is being/will be conducted for any such health implications. Periodical monitoring of noise is being/will be done.
Socio-Economic Environment	
Negative Impacts & Mitigation	
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.
Mining operations can disrupt traditional lifestyles and cultural practices of	Local communities will be engaged in culturally sensitive planning and decision-making processes.

indigenous or local communities	Cultural preservation initiatives will be supported and local traditions respected.
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.
Mining projects can also cause, displacement, increased crime, economic inequality, infrastructure strain, and long-term legacy problems, significantly impacting nearby human settlements and their quality of life.	Nearest settlement is 1.4 km away in WSW. (Village- New Nonglamin). There will be no physical or economic displacement due to the proposed project. Mitigation measures for nearby human settlements include, investing in community health and infrastructure, ensuring fair economic benefits, involving local communities in decision-making etc.

Positive Impacts

Income and Revenues

- 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.

Livelihoods

- Approximately 22 No. of people are 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.

Physical Infrastructure

- The road and power networks in the area are expected to be strengthened as part of sequential development.

Biological Environment

Clearing of vegetation from vegetation from land used for quarry, dumping of overburden, construction of infrastructure. Deforestation due to mining projects. Disturbance in wild life and other fauna due to clearing of vegetation/deforestation. Noise and vibrates due to blasting and machine operations drive away animals and birds from the region. Degradation of aquatic flora and fauna due to discharge of polluted water. Mining can affect vegetation in the core zone. The mining activity will generate dust which may impact the nearby biological environment. Removal of vegetation (flora) due to excavation for mining purposes. Dust generation during mining and transportation may impact vegetation.	**Conduct Assessments**: thorough EIA report has been prepared to understand potential impacts and design appropriate mitigation measures. **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. **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. **Restoration Plans**: Develop plans for ecosystem restoration and use native species for replanting. **Water and Air Management**: Control water contamination and air pollution through proper management and monitoring. **Safe Disposal**: Handle mining waste responsibly and explore recycling opportunities. **Soil Stabilization**: Implement erosion control methods like silt fences and vegetation planting. **Stakeholder Involvement**: Engage with local communities and address their concerns through education and feedback. **Continuous Monitoring**: Track environmental impacts and report on compliance with mitigation measures. **Adhere to Regulations**: Follow environmental regulations and permit requirements

5 ENVIRONMENTAL MONITORING PROGRAMME

5.1 AIR

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

5.2 WATER

Regular monitoring of ground water quality is being/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.

5.3 NOISE

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

5.4 HEALTH AND SANITATION

Periodical medical checkup of workers is being done and medical facility provided. The Initial Medical Examination (IME) is conducted at the start, while the Periodic Medical Examination (PME) is required every 3 years for those over 45 and every 5 years for those 45 or younger.

Toilets and urinals is being/will be provided near the mine site. Drinking water is being/will be made available to the workers.

6 ADDITIONAL STUDIES

6.1 PUBLIC HEARING

The draft EIA/EMP report is being submitted. Public hearing will be conducted as per the guidelines of EIA Notification14th September, 2006 and its subsequent amendments.

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

7 PROJECT BENEFITS

7.1 Summary of Project Benefits:

General Benefits:

- Provision of well-paid employment adhering to accepted labor standards.
- Education and training programs.
- Development of local industries and businesses.
- Support for government initiatives and social activities.
- Investment in community infrastructure.
- Health and sanitation programs, such as malaria prevention.
- Compliance with local, state, and federal laws.
- Increase in local employment and skilled workers.

Employment:

Direct Employment: About 22 people are employed directly during the operational phase, with some skilled personnel sourced externally and unskilled or semi-skilled personnel from the local area.

Indirect Employment: Local people is being/will find indirect work in sectors like tea shops, vehicle repairs, transportation, warehousing, and logistical activities. Additionally, vocational training will be provided to build a skilled workforce for local mines.

Improvements in Infrastructure:

Physical Infrastructure:

- Improved road communication and community facilities.
- Rainwater reservoirs to enhance water availability.
- Skill development programs and vocational training for income generation.
- Awareness programs like health camps and family welfare activities.

Social Infrastructure:

- Positive impacts in socio-economic development, including new employment and better educational and health facilities.
- Health care initiatives, including community health camps.
- Enhanced employment potential and contributions to the state and central government.

Health:

- Regular medical checkups as per Mines Act/Rules.
- Social development activities aimed at improving health standards in nearby communities.

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.

8.1 LAND USE MANAGEMENT

The following reclamation plan will be adopted in this mine.

- 0.50 hectares of the total leased area are already under plantation. Additionally, 1.072 hectares will be planted with 1,072 trees within the Safety Zone and Unworked Area inside the mining lease in the next 5-year plan period.
- At the conceptual stage, approximately 100 trees will be planted to stabilize 0.10 ha area of the waste dump, and 800 trees will be planted over 0.80 ha area of the upper benches.

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 is being/will be carried out to monitor the water quality.
- Domestic waste water will be channelized into septic tank followed by soak pit.

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 are being/will be covered with tarpaulin.
- Over loading is being/will be avoided and free board will be left in the loaded trucks to prevent spillage.
- 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 are being developed and /will be maintained along the roadside to control the dispersion of dust particles.
- Speed breakers will be constructed to restrict the speed of transporting vehicles. However, limiting of vehicular speed will be adopted.
- Regular monitoring and analysis is being/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.

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 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 is being/will be conducted on a regular basis to determine compliance with noise criteria.
- Personal Protective Equipment's 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 is being/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.

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 & equipment's as per manufacturer's guidelines.
- Provision of personal protective equipment to the workers working in the mine.
- Periodical Medical Examination of all workers by medical specialists will be conducted.
- Awareness program will be organized for workers.

8.6 SOCIO-ECONOMIC MANAGEMENT

- Environmental Officer will be responsible to take care the performance of mine on environmental issues.
- Approx. 21 local workers are being directly employed and about 30-40 will be indirectly employed.
- Employment opportunities along with periodical training to generate local skills.
- Local employment is being/will be ensured. On the job training to local people is being/will be given and periodically upgraded.
- Regular health camps are being/will be carried out.

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.

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.

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