EXECUTIVE SUMMARY

FOR OBTAINING ENVIRONMENTAL CLEARANCE

(Category - B1, under item 1 (a), as per EIA Notification 14th September' 2006 and its subsequent amendments till date)

FOR

"REKETUNG LIMESTONE MINE"

Location: - Reketung, Nongtalang, District West Jaintia Hills (Meghalaya)

Production Capacity: - 2,00,475 MTPA

Area: - 1.53 Ha; LOI issued dated 30.09.2021

Lease Validity: - 15 Years

Details of ToR Issued from SEIAA, Meghalaya

Baseline data Generation March' 2022 to May, 2022

(Pre Monsoon Season)

Project Cost Rs. 23.50 Lacs

PROMOTER

ENVIRONMENTAL CONSULTANT

Shri Robert Dkhar Village-Skhetanlang,

Gaurang Environmental Solutions Pvt. Ltd. #102, SNG, Shree Ratna Apartment, Peetal Factory,

District- West Jaintia Hills,

Jhotwara Road, Bani Park, Jaipur-302016

E-mail: gaurangenviro@gmail.com

Meghalaya

NABET Accreditation: NABET/EIA/2023/ RA0192

September, 2022

| Project:- Reketung Limestone Mine | |
|--|--|
| Applicant:- Shri Robert Dkhar | |

EXECUTIVE SUMMARY

1.0 INTRODUCTION

The proposed project "Reketung Limestone Mine" is situated at Reketung, Nongtalang District- West Jaintia Hills (Meghalaya). The total lease area of the project is 1.53 Ha. The mining activity will be carried out by open cast semi-mechanized method.

The Letter of Intent has been sanctioned in favour of Shri Robert Dkhar from the Office of Govt. of Meghalaya, Office of the Divisional Forest Officer (Territorial), Jaintia Hills Division Jowai vide letter no. JH/R.D./M.L./L.S/2021-22/B/1052 Dated 30.09.2021, which was valid upto 29.03.2022. The proposed mine is spread over an area of 1.53 ha. with mineable reserves of about 6,51,200 Tonnes to produce 2,00,475 MTPA of mineral.

1.1 LOCATION OF LEASE AREA

The proposed project "Reketung Limestone Mine" is situated at Reketung, Nongtalang District- West Jaintia Hills (Meghalaya).

1.2 DETAIL OF MINING LEASE

| S. No. | Particulars | Details | |
|--------|----------------------|---|--|
| 1. | Name of Project | Reketung Limestone Mine | |
| 2. | Location | Reketung, Nongtalang District- West Jaintia Hills (Meghalaya) | |
| 3. | Lease Area | 1.53 Ha. | |
| 4. | Land Type | Khatedari Land (Private) | |
| 5. | Latitude & Longitude | 25°14'36.5"N to 25°14'42.4"N and | |
| | | 92°5'28.6"E to 92°5'34.9"E | |
| 6. | Seismic Zone | Zone – V | |

1.3 PROJECT DESCRIPTION

The Letter of Intent has been sanctioned in favour of Shri Robert Dkhar from the Office of Govt. of Meghalaya, Office of the Divisional Forest Officer (Territorial), Jaintia Hills Division Jowai vide letter no. JH/R.D./M.L./L.S/2021-22/B/1052 Dated 30.09.2021, which was valid upto 29.03.2022. The proposed mine is spread over an area of 1.53 ha. with mineable reserves of about 6,51,200 Tonnes to produce 2,00,475 MTPA of mineral.

| Gaurang Environmental Solutions Pvt. Ltd. | Page 2 |
|---|-------------|
| Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|-----------------------------------|--|
| Applicant:- Shri Robert Dkhar | |

The proposed mining operations will be carried out by open cast semi - mechanized method.

1.4 GEOLOGY

1.4.1 LOCAL GEOLOGY

The lime stone has strike almost north- south and dip seems vertical in absence of workings. No fault, fold and geological disturbances are observed in the area. 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 |

1.4.2 PHYSIOGRAPHY

The topography of the lease area is hilly terrain. Highest elevation is 909 mSL and lowest is 846 mSL. The drainage of the lease area is southerly.

1.4.3 GEOLOGICAL AND MINEABLE RESERVES

Geological Reserve : 27,35,440 MT

Mineable Reserve : 6,51,200 MT

Production : 2,00,475 MTPA

Life of Mine : 05 Years

1.4.4 MINING

The mining 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 will be carried out by open cast semi-mechanized method.
- ➤ The bench height will be kept 6m and width of the bench will not be less than the height of the bench.

| | Gaurang Environmental Solutions Pvt. Ltd. | Page 3 |
|------|---|-------------|
| 1300 | Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|-----------------------------------|--|
| Applicant:- Shri Robert Dkhar | |

- ➤ Total Fourteen benches will be developed i.e. from Bench levels 904mSL (top bench), 898mSL, 892mSL, 886mSL, 880mSL, 874mSL, 868mSL, 862mSL, 850mSL, 844mSL, 838mSL, 832mSL, 826mSL, 820mSL (lowest bench).
- ➤ Blasting will be done by short or long holes with the permission of DGMS.
- ➤ The bench slope will be providing 85°.
- ➤ The loading will be from pits or from stocks.

1.4.5 PRODUCTION DETAILS

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

ROM (T) Waste / sub-grade Year Limestone Dimensional (T) **(T)** 1st Year 222700 22275 200425 2nd Year 222750 22275 200475 3rd Year 111150 11100 100050 4th Year 111130 11125 100175 5th Year 55650 5575 50075 Total 723550 72350 651200

Table 1.2: Production Details

1.4.6 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 | Pre-Operational | Operational | Post- Operational (Ha.) |
|--------|--------------------------|------------------------|-------------|-------------------------|
| | | (Ha.) | (Ha.) | |
| 1 | Top Soil Dump | 00 | 0.01 | 00 |
| 2 | Overburden Dump | 00 | 0.07 | 0.07 |
| 3 | Pit & Quarry Area | 00 | 1.17 | 1.17 |
| | Excavation (Voids Only) | 00 | 00 | 0.35 |
| | Reclamation (Backfilled) | 00 | 00 | 0.82 |
| 4 | Road | 00 | 0.02 | 0.02 |
| 5 | Infrastructure | 00 | 0.01 | 00 |
| 6 | Afforestation | 00 | 0.10 | 0.20 |

| Gaurang Environmental Solutions Pvt. Ltd. | Page 4 |
|---|-------------|
| Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|--|--|
| Applicant:- Shri Robert Dkhar | |

| Total | | 1.53 | 1.53 | 1.53 |
|-------|------------------------|------|------|------|
| 9 | Undisturbed Area | 1.53 | 0.15 | 0.07 |
| 8 | Sub – grade stack yard | 00 | 00 | 00 |
| 7 | Mineral Storage | 00 | 00 | 00 |

1.5 DESCRIPTION OF THE ENVIRONMENT

For monitoring the environmental parameters like meteorology, air, water, soil and noise quality, the monitoring stations have been established at eight locations in the study area. The baseline data has been collected in the pre monsoon season (March 2022 to May 2022). The detail of the sampling locations is given in below:-

Table 1.4: Sampling Location

| Sampling Location | Distance | Direction | Components |
|-------------------------------|----------|-----------|-------------------------|
| | (Km) | | |
| Dominic (Mine Site) | | | Air, Water, Noise, Soil |
| Shri Robert Dkhar (Mine Site) | 2.0 | N | Air, Water, Noise, Soil |
| Amjajer Roko | 1.2 | ENE | Air, Water, Noise, Soil |
| Smt Phul Bareh (Mine Site) | 1.6 | SW | Air, Water, Noise, Soil |
| Nongtalang Chnongthmai | 1.7 | SW | Air, Water, Noise, Soil |
| Sohkha | 5.5 | WSW | Air, Water, Noise, Soil |
| Khonglah | 8.0 | WNW | Air, Water, Noise, Soil |
| Amtapoh | 3.0 | N | Air, Water, Noise, Soil |

1.5.1 LAND ENVIRONMENT

1.5.1.1 Soil Quality

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

| pН | : | 7.14-7.85 |
|----------------------|---|-------------------------|
| Total Organic Matter | : | 0.36 – 0.51 (% by mass) |
| Total Kjeldahl | : | 0.023 - 0.042 % |
| Nitrogen (TKN) | | |
| Phosphorus as P | : | 10.67-12.80 (mg/kg) |
| Potassium as K | : | 236.00-248.50 (mg/kg) |

| Gaurang Environmental Solutions Pvt. Ltd. | Page 5 |
|---|-------------|
| Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|-----------------------------------|--|
| Applicant:- Shri Robert Dkhar | |

1.5.1.2 Water Environment

Eight ground water samples have been considered in the study area. The analysis results are presented below:-

Table 1.6: Water Quality Status

| Gaurang Environmental Solutions Pvt. Ltd. | Page 6 |
|---|-------------|
| Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|-----------------------------------|--|
| Applicant:- Shri Robert Dkhar | |

| S. No. | Parameter | Requirem ent (Desirable Limits). | Permissible Limits in the Absence of Alternate Source. | Units | Dominic (Mine Site) | Shri Robert Dkhar (Mine Site) | Amjajer Roko | Smt Phul Bareh | Nongtalang Chnongthmai | Sohkha | Khonglah | Amtapoh |
|-----------|------------------------------|---|--|--------------|---------------------------|--|-----------------|-------------------|---------------------------|--------------|-----------------|-----------------|
| | | | 1 | | | ochemical Par | ameter | | | | | |
| 1. | Colour | 5 | 15 | Hazen | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2. | Odour | Agreeable | Agreeable | - | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 3. | Taste | Agreeable | - | - | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 4. | Turbidity | 1 | 5 | NTU | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 5. | pH value | 6.5-8.5 | - | - | 7.26 | 7.58 | 7.42 | 7.50 | 7.37 | 7.21 | 7.89 | 6.94 |
| 6 | Total Hardness (as CaCO3) | 300 | 600 | mg/l | 162 | 174 | 163 | 152 | 154 | 162 | 148 | 160 |
| 7 | Alkalinity as CaCO3 | 200 | 600 | mg/l | 180 | 182 | 196 | 175 | 166 | 175 | 160 | 172 |
| 8 | Iron (as Fe) | 1.0 | No Relaxation | mg/l | 0.132 | 0.126 | 0.125 | 0.150 | 0.115 | 0.135 | 0.121 | 0.128 |
| 9 | Chlorides (as Cl) | 250 | 1000 | mg/l | 15.0 | 18.0 | 14.0 | 15.5 | 16.0 | 14.0 | 16.6 | 18.0 |
| 10 | Fluoride (as F) | 1 | 1.5 | mg/l | 0.22 | 0.27 | 0.21 | 0.32 | 0.24 | 0.25 | 0.35 | 0.21 |
| 11 | Conductivity | - | - | μmhos/c m | 470 | 512 | 480 | 498 | 482 | 380 | 455 | 426 |
| 12 | TDS | 500 | 2000 | mg/l | 308 | 340 | 334 | 320 | 309 | 242 | 298 | 277 |
| 13 | Calcium(as Ca2+) | 75 | 200 | mg/l | 51.0 | 56.6 | 54.2 | 55.0 | 58.0 | 60.0 | 57.5 | 58.0 |
| 14 | Magnesium (as Mg2+) | 30 | 100 | mg/l | 8.34 | 7.86 | 6.65 | 3.50 | 2.17 | 2.91 | 1.02 | 3.64 |
| 15 | Copper (as Cu) | 0.05 | 1.5 | mg/l | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) |
| 16 | Manganese(as Mn) | 0.1 | 0.3 | mg/l | BDL (<0.05) | BDL (<0.05) | BDL(<0.0 5) | BDL(<0.05) | BDL (<0.05) | BDL (<0.05) | BDL(<0.05) | BDL(<0.05 |
| 17 | Sulphate (as SO4) | 200 | 400 | mg/l | 28.0 | 26.5 | 23.2 | 26.0 | 21.0 | 24.0 | 20.6 | 25.8 |
| 18 | Nitrate(as NO3) | 45 | No Relaxation | mg/l | 2.12 | 2.50 | 1.60 | 2.45 | 2.60 | 3.81 | 2.55 | 2.02 |
| 19 | Mercury (as Hg) | 0.001 | No Relaxation | mg/l | BDL (<0.001) | BDL (<0.001) | BDL (<0.001) | BDL (<0.001) | BDL (<0.001) | BDL (<0.001) | BDL (<0.001) | BDL (<0.001) |
| 20 | Cadmium (as Cd) | 0.01 | No Relaxation | mg/l | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) | BDL (<0.01) |

| | Gaurang Environmental Solutions Pvt. Ltd. | Page 7 |
|------|---|-------------|
| 1100 | Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|-----------------------------------|--|
| Applicant:- Shri Robert Dkhar | |

| 21 | Selenium (as Se) | 0.01 | No | mg/l | BDL | BDL | BDL | BDL | BDL (<0.01) | BDL | BDL (<0.01) | BDL |
|----|--------------------|--------------|--------------|----------|---------|----------------|----------|---------|--------------|---------|--------------|---------|
| | , , , | | Relaxation | | (<0.01) | (<0.01) | (<0.01) | (<0.01) | , , , , | (<0.01) | · · · | (<0.01) |
| 22 | Arsenic (as As) | 0.01 | No | mg/l | BDL | BDL | BDL | BDL | BDL (<0.01) | BDL | BDL (<0.01) | BDL |
| | | | Relaxation | | (<0.01) | (<0.01) | (<0.01) | (<0.01) | | (<0.01) | | (<0.01) |
| 23 | Cyanide (as CN) | 0.05 | No | mg/l | BDL | BDL | BDL | BDL | BDL (<0.01) | BDL | BDL (<0.01) | BDL |
| | , , , | | Relaxation | <u>U</u> | (<0.01) | (<0.01) | (<0.01) | (<0.01) | ` ′ | (<0.01) | ` ′ | (<0.01) |
| 24 | Lead (as Pb) | 0.05 | No | mg/l | BDL | BDL | BDL | BDL | BDL (<0.01) | BDL | BDL (<0.01) | BDL |
| | Lead (as 1 b) | | Relaxation | 1115/1 | (<0.01) | (<0.01) | (<0.01) | (<0.01) | BBE (<0.01) | (<0.01) | BBE (<0.01) | (<0.01) |
| 25 | Zinc (as Zn) | 5 | 15 | mg/l | 0.128 | 0.132 | 0.141 | 0.136 | 0.145 | 0.136 | 0.145 | 0.126 |
| 26 | Anionic Detergent | 0.2 | 1 | mg/l | BDL | BDL | BDL | BDL | DDI (<0.10) | BDL | BDL (<0.10) | BDL |
| 20 | (as MBAS) | MBAS) 0.2 | 1 | | (<0.10) | (<0.10) | (<0.10) | (<0.10) | BDL (<0.10) | (<0.10) | BDL (<0.10) | (<0.10) |
| 27 | Chromium (as | 0.05 | No | | BDL | BDL | BDL | BDL | DDI (.0.05) | BDL | DDI ((0.05) | BDL |
| 27 | Cr6+) | 0.05 | Relaxation | mg/l | (<0.05) | (<0.05) | (<0.05) | (<0.05) | BDL (<0.05) | (<0.05) | BDL (<0.05) | (<0.05) |
| 28 | Minaral ail | 0.01 | 0.03 | m a /1 | BDL | BDL | BDL | BDL | BDL (<0.50) | BDL | DDI (<0.50) | BDL |
| 20 | Mineral oil | 0.01 | 0.03 | mg/l | (<0.50) | (<0.50) | (<0.50) | (<0.50) | BDL (<0.30) | (<0.50) | BDL (<0.50) | (<0.50) |
| 29 | Aluminium (as | 0.02 | 0.2 | mg/l | BDL | BDL | BDL | BDL | DDI (30.01) | BDL | DDI ((0.01) | BDL |
| | Al) | 0.03 | 0.2 | _ | (<0.01) | (<0.01) | (<0.01) | (<0.01) | BDL (<0.01) | (<0.01) | BDL (<0.01) | (<0.01) |
| 20 | D (D) | 1 | - | | BDL | BDL | BDL | BDL | DDI ((0.10) | BDL | DDI ((0.10) | BDL |
| 30 | Boron (as B) | 1 | 1 5 | 5 mg/l | (<0.10) | (<0.10) | (<0.10) | (<0.10) | BDL (<0.10) | (<0.10) | BDL (<0.10) | (<0.10) |
| | | | | | Mic | robiological P | arameter | | | | | |
| 1. | Escherichia coli | Absent/100ml | | | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 2. | Coliform Bacteria | | Absent/100ml | | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |

| Gaurang Environmental Solutions Pvt. Ltd. | Page 8 |
|---|-------------|
| Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|--|--|
| Applicant:- Shri Robert Dkhar | |

1.5.2 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.

1.5.2.1 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. March' 2022 to May' 2022. The summary of these results for all the locations is given below. These are compared with the standards prescribed by Central Pollution Control Board (CPCB) for rural and residential zone.

Table 1.7: Ambient Air Quality Status

| S. No. | Sampling | | | | Parameters | S | |
|--------|--------------|-----------|------------------|----------------------|----------------------|-----------------|----------------------|
| | Location | | PM ₁₀ | PM _{2.5} | SO ₂ | NO _x | CO |
| | | | $(\mu g/m^3)$ | (μg/m ³) | (μg/m ³) | $(\mu g/m^3)$ | (mg/m ³) |
| 1. | Dominic | Min | 37.21 | 25.96 | 6.69 | 8.44 | 0.3 |
| | (Mine Site) | Max | 56.78 | 36.58 | 8.95 | 13.45 | 0.59 |
| | | Avg. | 45.01 | 29.51 | 7.51 | 9.93 | 0.43 |
| | | 98th% ile | 56.57 | 35.85 | 8.90 | 13.35 | 0.58 |
| 2. | Shri Robert | Min | 42.61 | 27.44 | 7.26 | 10.52 | 0.29 |
| | Dkhar (Mine | Max | 55.47 | 36.22 | 11.24 | 16.25 | 0.71 |
| | Site) | Avg. | 48.92 | 29.89 | 9.11 | 13.12 | 0.48 |
| | | 98th% ile | 55.07 | 35.85 | 11.07 | 15.98 | 0.69 |
| 3. | Amjajer Roko | Min | 34.52 | 20.12 | 7.54 | 9.68 | 0.3 |
| | | Max | 55.48 | 32.26 | 10.88 | 14.66 | 0.77 |
| | | Avg. | 44.15 | 25.22 | 8.89 | 11.33 | 0.48 |
| | | 98th% ile | 55.36 | 31.74 | 10.87 | 14.54 | 0.74 |
| 4. | Smt Phul | Min | 32.14 | 20.11 | 5.69 | 8.55 | 0.26 |
| | Bareh (Mine | Max | 48.65 | 28.88 | 8.49 | 13.62 | 0.53 |
| | Site) | Avg. | 39.21 | 23.07 | 6.80 | 9.74 | 0.40 |
| | | 98th% ile | 48.54 | 27.72 | 8.47 | 13.59 | 0.52 |
| 5. | Nongtalang | Min | 32.52 | 20.68 | 5.35 | 9.24 | 0.35 |
| | Chnongthmai | Max | 47.32 | 29.53 | 9.47 | 14.63 | 0.8 |
| | Cimonguina | Avg. | 37.43 | 24.45 | 7.23 | 10.98 | 0.53 |
| | | 98th% ile | 46.44 | 29.25 | 9.45 | 14.14 | 0.77 |
| 6. | Sohkha | Min | 34.25 | 23.48 | 7.15 | 9.35 | 0.28 |
| | | Max | 57.02 | 32.28 | 9.32 | 14.63 | 0.63 |
| | | Avg. | 44.31 | 26.52 | 8.26 | 11.01 | 0.45 |
| | | 98th% ile | 56.91 | 32.23 | 9.18 | 14.47 | 0.63 |
| 7. | Khonglah | Min | 30.52 | 18.44 | 5.35 | 8.26 | 0.38 |
| | | Max | 45.62 | 26.65 | 7.85 | 12.98 | 0.82 |

| Gaurang Environmental Solutions Pvt. Ltd. | Page 9 |
|---|-------------|
| Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|--|--|
| Applicant:- Shri Robert Dkhar | |

| | | Avg. | 35.28 | 20.49 | 6.18 | 9.60 | 0.56 |
|----------------|---------|-----------|-------|-------|------|-------|------|
| | | 98th% ile | 44.65 | 24.44 | 7.51 | 12.43 | 0.80 |
| 8. | Amtapoh | Min | 32.23 | 15.45 | 6.24 | 10.2 | 0.42 |
| | | Max | 45.08 | 19.1 | 8.74 | 15.52 | 0.71 |
| | | Avg. | 41.41 | 16.93 | 7.38 | 11.81 | 0.55 |
| | | 98th% ile | 45.03 | 18.88 | 8.70 | 14.83 | 0.71 |
| NAAQ STANDARDS | | 100 | 60 | 80 | 80 | 2 | |

1.5.3 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 1.8: Ambient Noise Level Status

| Location | Date of | Day Time | Night Time |
|-------------------------------|------------|---------------------|-----------------------|
| | Sampling | (6.00 AM to 10.0PM) | (10.00 PM to 6.00 AM) |
| Dominic (Mine Site) | 01.03.2022 | 59.2 | 46.1 |
| Shri Robert Dkhar (Mine Site) | 03.03.2022 | 58.4 | 44.7 |
| Amjajer Roko | 05.03.2022 | 53.1 | 41.2 |
| Smt Phul Bareh (Mine Site) | 06.03.2022 | 57.6 | 45.0 |
| Nongtalang Chnongthmai | 08.03.2022 | 51.5 | 42.6 |
| Sohkha | 10.03.2022 | 54.6 | 40.2 |
| Khonglah | 12.03.2022 | 50.2 | 43.8 |
| Amtapoh | 14.03.2022 | 53.6 | 41.4 |
| | | 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 |

1.5.4 SOCIO-ECONOMIC ENVIRONMENT

The study area includes the 53 Villages Amsyndui, Elaka Nongtalang District- West Jaintia Hills (Meghalaya) within 10 km of area from mine periphery.

10

Table 1.9: Demography Profile of the Study Area

| S. | Particulars | Details |
|----|-------------|---------|
|----|-------------|---------|

| 8 | Gaurang Environmental Solutions Pvt. Ltd. | Page |
|---|---|----------|
| | Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. |

| Project:- Reketung Limestone Mine | |
|--|--|
| Applicant:- Shri Robert Dkhar | |

| No. | | | |
|-----|--------------|-----------------|--------|
| 1. | No. | 53 | |
| 2. | Tota | l Population | 26,606 |
| | a. | Male | 13,221 |
| | b. | Female | 13,385 |
| 3. | No. | of Households | 4,798 |
| 4. | No. | of Literates | 16,350 |
| | a. | Male | 8,054 |
| | b. | Female | 8,296 |
| 5. | Main Workers | | 11,714 |
| | a. | Male | 6,910 |
| | b. | Female | 4,804 |
| 6. | Ma | arginal Workers | 4,220 |
| | a. | Male | 1,982 |
| | b. | Female | 2,238 |
| 7. | Non-workers | | 14,892 |
| | a. | Male | 6,311 |
| | b. | Female | 8,581 |

(Source: Census, 2011)

1.5.5 BIOLOGICAL ENVIRONMENT

| Core Zone | Buffer Zone |
|-------------------------|--------------------------|
| Flora | |
| Climber – 6 Specie | Climber – 19 Specie |
| Herb – 7 Species | Herb – 40 Species |
| Shrubs - 8 Species | Shrubs - 70 Species |
| Tree - 9 Species | Tree – 74 Species |
| Fauna | |
| Amphibian - 6 Species | Amphibian – 17 Species |
| Fish - 4 Species | Fish - 16 Species |
| Avifauna - 31 Species | Avifauna – 92 Species |
| Butterflies – 4 Species | Butterflies – 28 Species |
| Mammals – 2 Species | Mammals – 27 Species |

| Gaurang Environmental Solutions Pvt. Ltd. | Page 11 |
|---|-------------|
| Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|--|--|
| Applicant:- Shri Robert Dkhar | |

1.6 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 ENVIRONMENTAL MANAGEMENT PLAN

| Impact | Mitigation Measures | | |
|--|---|--|--|
| | Land Environment | | |
| Land will be degraded due to | The total excavated area 1.17 ha., out of which 0.35 ha. will be used as | | |
| mining and dumping of waste | a water reservoir and remaining 0.82 ha. area will be backfilled and | | |
| | reclaimed and rehabilitated by plantation. The extent of impact will | | |
| | however; be confined within lease area only. | | |
| Water Environment | | | |
| Discharge of effluents water | There will be no discharge of effluent from the mine. Mine pit (0.35 ha.) | | |
| rom the mine. will act as a water reservoir. | | | |

| | Gaurang Environmental Solutions Pvt. Ltd. | Page 12 |
|--|---|-------------|
| | Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|-----------------------------------|--|
| Applicant:- Shri Robert Dkhar | |

Intersection of ground water table during mining operations.

As per the approved Mining Plan along with PMCP, ultimate pit level (820 mSL) will be above the ground water table and hence it will not be intersected.

Air Environment

- ➤ Dust will be generated mainly during excavation, loading & unloading activities.
- ➤ Gaseous pollutants will by generated mostly by the traffic.
- ➤ It will be ensured that all the vehicles plying in the working zone are properly tuned and maintained to keep emissions within the permissible limits.
- ➤ At loading & unloading points and transportation routes, arrangement for water sprinkling will be made to minimize dust generation.
- ▶ In order to predict changes in the air quality, AERMOD version 8.8.0 model was used. The maximum ground level concentrations of particulate matter PM_{10} & $PM_{2.5}$, NOx, CO from the different mining activities for the study period (Pre Monsoon Season) were observed to be 3.1137 $\mu g/m^3$ & 2.2240 $\mu g/m^3$, 0.21 $\mu g/m^3$, 0.00034 mg/m^3 respectively.
- ➤ The resultant will remain within the National Ambient Air Quality Standards for industrial/residential areas.

Noise Environment

- ➤ Noise due to mining activities.
- ➤ Noise due to vehicular movement.
- > The noise levels from all these sources are periodical and restricted to particular operation.
- ➤ The noise measurement data indicated that present noise levels in the study area is within the permissible limits of National Ambient Noise Quality Standards.
- ➤ Thus, due to natural attenuation effects by proper green belt/ maintenance of machines etc., the impact of noise levels will be minimal.

Socio-Economic Environment

- > Employment generation
- ➤ Health impacts
- > Education Facilities
- ➤ The mining activity puts negligible change in the socio economic profile.
- ➤ No displacement (0) is proposed due to proposed mine.
- ➤ Approx. 41 local workers will get employment opportunities along with periodical training to generate local skills.
- ➤ New patterns of indirect employment/ income will generate.

| , | _ | |
|---|-------|--|
| ٤ | | |
| ď | ¥ | |
| 4 | - | |
| 7 | -0.00 | |

| Gaurang Environmental Solutions Pvt. Ltd. | Page 13 |
|---|-------------|
| Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|-----------------------------------|--|
| Applicant:- Shri Robert Dkhar | |

- > Regular health Checkup camp.
- ➤ Assistance to schools and scholarship to children will be provided.

Biological Environment

- > Impact on biodiversity
- Impact on threatened species
- ➤ The mining activity will have insignificant effect on the existing flora and fauna. The purpose of the project itself is to save the flora around the project area.
- ➤ The existing vegetation within the mining area includes trees and shrubs vegetation. They will not be disturbed due to the mining activity. So, the impact on the vegetation is very less.
- ➤ The transportation of waste may create dust pollution which may create loss of biodiversity of the area.
- ➤ Dust in atmosphere, contributed by mining and associated activities, when deposited on the leaves of the plants in the surrounding areas may retard their growth.
- ➤ The growth of vegetation in and around the complexes. Noise and vibrations due to blasting and operation of the machines drive away the wild animals and birds from the nearby nests.
- ➤ The cluster area and its buffer zone are devoid of any eco sensitive area. So the impact on the biodiversity and wild life is minimal.
- ➤ Green belt will be developed along the individual lease boundary which will act as a pollution barrier for the biological environment.
- ➤ There is the proposal for plantation along the haul road of individual lease and also along the connecting road.
- ➤ The blasting, drilling and transportation will be carried out during the day time only minimizing the impact on the wild fauna movement.
- ➤ All the necessary pollution control measures will be undertaken by the lessee to minimize the impact on the surrounding environment.

1.8 ENVIRONMENTAL ACTION PROGRAMME

The breakup of the proposed cost for Environment Management Programme is given as under:-

Table 1.10: Provision for Environmental Protection Measures

| 8 | Gaurang Environmental Solutions Pvt. Ltd. | Page 14 |
|---|---|-------------|
| | Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |

| Project:- Reketung Limestone Mine | |
|-----------------------------------|--|
| Applicant:- Shri Robert Dkhar | |

| S. No. | Description | Capital Cost | Recurring Cost |
|--------|---|---------------|-----------------------|
| | | (Rs. In Lacs) | (Rs. In Lacs) |
| 1. | Environmental Monitoring (Air, Water, Noise and Soil) | | 2.00 |
| 2. | Occupational Health and Safety (Initial & Periodical Medical Check-ups) | 1.00 | 0.50 |
| 3. | Green Belt (phase wise greenbelt development during plantation plan period) | 4.35 | 0.44 |
| 4. | Construction & Maintenance of Settling Tank, Garland Drains etc. | 1.00 | 0.40 |
| 5. | Provision of fencing around mine pit | 1.00 | 0.20 |
| 6. | Environmental Awareness Program | | 0.50 |
| 7. | Rain Water Harvesting | 1.00 | 0.25 |
| 8. | Socio EMP | 0.47 | |
| | Total | 8.82 | 4.29 |

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.

| Gaurang Environmental Solutions Pvt. Ltd. | Page 15 |
|---|-------------|
| Report Ref: GESPL_501/EIA/2022-23/137 | Rev. No. 01 |