EXECUTIVE SUMMARY FOR OBTAINING ENVIRONMENTAL CLEARANCE

(Category-B1,under item1(a), as per EIA Notification14th September'2006 and its subsequent amendments till date)

FOR

"AMSYNDUI LIMESTONE MINE"

Location:-Amsyndui, Nongtalang, District West Jaintia Hills, State: Meghalaya

Production Capacity: - 1,60,200 TPA of ROM

(Limestone:-1,44,200TPA; Waste:-16,000TPA)

Area: - 4.50 Ha; LOI issued dated 27.03.2019

Lease Validity: 20 Years (From the date of Registration)

| Report No. | | GESPL_4 | 197/2024-2 | 5/DEIA/155 | | | | |
|-----------------------|---|-----------|-------------|-------------|--------------------|-----------|--------|----|
| Details of ToR | : | Issued | from | SEIAA, | Meghalaya | vide | letter | no |
| | | ML/SEIA | AA/MIN/V | WJH/P-250/2 | 022/809dated25 | .06.2024 | | |
| Environmental | : | NOIDA T | ESTING I | LABORATOF | RIES | | | |
| Monitoring | | NABL Ce | rtificate | TC-6814,Val | idityperiod:03/12/ | 2023-02/1 | 2/2025 | |
| laboratory engaged: | | Number | & | | | | | |
| | | Validity | | | | | | |
| Baseline study period | : | March 20 | 022 to Ma | y2022 (Sum | mer Season) | | | |
| Project cost | : | Rs.23.50L | acs | | | | | |
| Project In-charge | : | Shri. Dom | ninic Pohri | men | | | | |
| Work order no | : | Nil | | | | | | |

PROMOTER

ENVIRONMENTAL CONSULTANT

Shri. Dominic Pohrmen

Gaurang Environmental Solutions Pvt. Ltd.

Village-Nongtalang, District-West

#102,SNG,Shree Ratna Apartment, Peetal Factory, Jhotwara

Jaintia Hills, Meghalaya

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NABET Accreditation: NABET/EIA/23-26/RA0338

ValiduptoDec07,2024

July 2024

| Project:-Amsyndui Limestone Mine | |
|----------------------------------|--|
| Applicant:-Shri. Dominic Pohrmen | |

EXECUTIVE SUMMARY

INTRODUCTION

The proposed project "Amsyndui Limestone Mine" is situated at Amsyndui, Nongtalang District- West Jaintia Hills (Meghalaya). The total lease area of the project is 4.50 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 Dominic Pohrmen from the Office of Govt. of Meghalaya, Office of the Divisional Forest Officer (Territorial), Jaintia Hills Division Jowai vide letter no. JH/MMMCR-2016/2016-17/869/B/2641 Dated 27.03.2019, which was valid upto 26.09.2019. The proposed mine is spread over an area of 4.50 ha. with mineable reserves of about 22,65,000 Tonnes to produce 1,60,200 TPA of ROM (Limestone: -1,44,200 TPA and Waste: -16,000 TPA).

LOCATION OF LEASE AREA

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

DETAIL OF MINING LEASE

| S. No. | Particulars | Details |
|--------|----------------------|--|
| 1. | Name of Project | Amsyndui Limestone Mine |
| 2. | Location | Amsyndui, Nongtalang District-West Jaintia Hills (Meghalaya) |
| 3. | Lease Area | 4.50Ha. |
| 4. | Land Type | Khatedari Land (Private) |
| 5. | Latitude & Longitude | 25°12'32.1"Nto25°11'38.8"Nand |
| | | 92°5'09.7"Eto92°5'22.6"E |
| 6. | Seismic Zone | Zone-V |

PROJECT DESCRIPTION

The Letter of Intent has been sanctioned in favour of Shri Dominic Pohrmen from the Office of Govt. of Meghalaya, Office of the Divisional Forest Officer (Territorial), Jaintia Hills Division: Jowai vide letter no. JH/MMMCR-2016/2016-17/869/B/2641Dated

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| Project:-Amsyndui Limestone Mine | |
|----------------------------------|--|
| Applicant:-Shri. Dominic Pohrmen | |

27.03.2019, which was valid upto 26.09.2019. The proposed mine is spread over an area of 4.50 ha. with mineable reserves of about 322,65,000 Tonnes to produce 1,60,200 TPA of ROM (Limestone:- 1,44,200 TPA and Waste:- 16,000 TPA).

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

GEOLOGY

LOCAL GEOLOGY

The limestone is exposed in the whole lease area. No other rocks exposed in the lease area. 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:-

Table11.1:LocalGeology

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

PHYSIOGRAPHY

The topography of the lease area is hilly terrain. Highest elevation is 789MSL and lowest is 711 MSL. The drainage of the lease area is southerly.

GEOLOGICALANDMINEABLERESERVES

Geological Reserve : 78,45,860 MT

Mineable Reserve : 22,65,000 MT

Production :1,60,200TPAofROM

Life of Mine :16 Years

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.

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- > The bench height will be kept 6m and width of the bench will not be less than the height of the bench.
- ➤ Total nine bench will be developed i.e. from Bench levels 780MSL(topbench), 774MSL,768MSL,762MSL,756MSL,750MSL,744MSL,738MSLand732MSL (lowest bench).
- ➤ Blasting will be done by short or long holes with the permission of DGMS.
- ➤ Thebenchslopewillbeproviding85°.
- ➤ The loading will be from pits or from stocks.

PRODUCTION DETAILS

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

Table1.2:Production Details

| Year | ROM(T) | Waste/sub-grade(T) | Limestone Dimensional (T) |
|----------------------|----------|--------------------|----------------------------------|
| 1 st Year | 1,60,200 | 16,025 | 1,44,175 |
| 2 nd Year | 1,60,200 | 16,000 | 1,44,200 |
| 3 rd Year | 1,60,200 | 16,025 | 1,44,175 |
| 4 th Year | 1,60,200 | 16,025 | 1,44,175 |
| 5 th Year | 1,60,200 | 16,025 | 1,44,175 |
| Total | 8,01,000 | 80,100 | 7,20,900 |

LANDUSEPATTERN

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

| Sl. No. | Land Use Category | Pre-Operational (Ha.) | Operational (Ha.) | Post-Operational (Ha.) |
|------------|-------------------------|-----------------------|----------------------|-------------------------------|
| 1 | Top Soil Dump | 00 | 0.02 | 00 |
| 2 | Over burden Dump | 00 | 0.15 | 0.15(Reclaimed by Plantation) |
| 3 | Pit & Quarry Area | 2.80 | 3.40 | 3.50 |
| | Excavation(Voids Only) | 00 | 00 | 1.40 |
| | Reclamation(Backfilled) | 00 | 00 | 2.10 |
| 4 | Road | 0.10 | 0.10 | 0.10 |
| 5 | Infrastructure | 00 | 0.01 | 0.01 |

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| | Total | 4.50 | 4.50 | 4.50 |
|---|----------------------|------|------|------|
| 9 | Undisturbed Area | 1.60 | 0.61 | 0.44 |
| 8 | Sub-grade stack yard | 00 | 00 | 00 |
| 7 | Mineral Storage | 00 | 00 | 00 |
| 6 | Afforestation | 00 | 0.20 | 0.30 |

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(Km) | Direction | Components |
|-------------------------------|--------------|-----------|-------------------------|
| 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 |

LAND ENVIRONMENT

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(%bymass) |
| 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) |

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| Project:-Amsyndui Limestone Mine | |
|----------------------------------|--|
| Applicant:-Shri. Dominic Pohrmen | |

Water Environment

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

Table1.6:WaterQuality Status

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| Project:-AmsynduiLimestoneMine | |
|--------------------------------|--|
| Applicant:-ShriDominicPohrmen | |

| S. No. | Parameter | Requirem ent (Desirable Limits). | Permissible Limits in the Absence of Alternate Source. | Units | Dominic (Mine Site) | Shri Robert Dkhar (MineSite) | Amjajer Roko | SmtPhul Bareh | Nongtalang Chnongthmai | Sohkha | Khonglah | Amtapoh |
|-----------|--------------------------|---|--|--------------|---------------------------|---------------------------------------|-----------------|------------------|---------------------------|-----------------|-----------------|-----------------|
| | | | | | | iochemicalPar | 1 | | • | 1 | | |
| 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. | pHvalue | 6.5-8.5 | - | - | 7.26 | 7.58 | 7.42 | 7.50 | 7.37 | 7.21 | 7.89 | 6.94 |
| 6 | TotalHardness (as CaCO3) | 300 | 600 | mg/l | 162 | 174 | 163 | 152 | 154 | 162 | 148 | 160 |
| 7 | Alkalinityas CaCO3 | 200 | 600 | mg/l | 180 | 182 | 196 | 175 | 166 | 175 | 160 | 172 |
| 8 | Iron(asFe) | 1.0 | No Relaxation | mg/l | 0.132 | 0.126 | 0.125 | 0.150 | 0.115 | 0.135 | 0.121 | 0.128 |
| 9 | Chlorides(asCl) | 250 | 1000 | mg/l | 15.0 | 18.0 | 14.0 | 15.5 | 16.0 | 14.0 | 16.6 | 18.0 |
| 10 | Fluoride(asF) | 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(asCa2+) | 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(asSO4) | 200 | 400 | mg/l | 28.0 | 26.5 | 23.2 | 26.0 | 21.0 | 24.0 | 20.6 | 25.8 |
| 18 | Nitrate(asNO3) | 45 | No Relaxation | mg/l | 2.12 | 2.50 | 1.60 | 2.45 | 2.60 | 3.81 | 2.55 | 2.02 |
| 19 | Mercury(asHg) | 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(asCd) | 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) |

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| 21 | Colonium(asCo) | 0.01 | No | ma/1 | BDL | BDL | BDL | BDL | BDL(<0.01) | BDL | BDL(<0.01) | BDL |
|----|--------------------------|------|--------------|--------|---------|---------|---------|---------|-------------|---------|-------------|---------|
| 21 | Selenium(asSe) | 0.01 | Relaxation | mg/l | (<0.01) | (<0.01) | (<0.01) | (<0.01) | BDL(<0.01) | (<0.01) | BDL(<0.01) | (<0.01) |
| 22 | Arsenic(asAs) | 0.01 | No | mg/l | BDL | BDL | BDL | BDL | BDL(<0.01) | BDL | BDL(<0.01) | BDL |
| | THEOMIC (GET IS) | 0.01 | Relaxation | | (<0.01) | (<0.01) | (<0.01) | (<0.01) | BBE(0.01) | (<0.01) | BBE(0.01) | (<0.01) |
| 23 | Cyanide(asCN) | 0.05 | No | mg/l | BDL | BDL | BDL | BDL | BDL(<0.01) | BDL | BDL(<0.01) | BDL |
| | Cyamac(asciv) | 0.05 | Relaxation | IIIg/I | (<0.01) | (<0.01) | (<0.01) | (<0.01) | DDE(10.01) | (<0.01) | DDL(\0.01) | (<0.01) |
| 24 | Lead(asPb) | 0.05 | No | mg/l | BDL | BDL | BDL | BDL | BDL(<0.01) | BDL | BDL(<0.01) | BDL |
| 24 | Lead(asi 0) | 0.03 | Relaxation | mg/1 | (<0.01) | (<0.01) | (<0.01) | (<0.01) | DDL(~0.01) | (<0.01) | DDL(~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 | BDL(<0.10) | BDL | BDL(<0.10) | BDL |
| 20 | (as MBAS) | 0.2 | 1 | | (<0.10) | (<0.10) | (<0.10) | (<0.10) | DDL(~0.10) | (<0.10) | BDL(~0.10) | (<0.10) |
| 27 | Chromium (as | 0.05 | No | m ≈/1 | BDL | BDL | BDL | BDL | DDI (<0.05) | BDL | DDI (<0.05) | BDL |
| 21 | Cr6+) | 0.03 | Relaxation | mg/l | (<0.05) | (<0.05) | (<0.05) | (<0.05) | BDL(<0.05) | (<0.05) | BDL(<0.05) | (<0.05) |
| 28 | Mineraloil | 0.01 | 0.03 | ma/1 | BDL | BDL | BDL | BDL | BDL(<0.50) | BDL | BDL(<0.50) | BDL |
| 20 | Milleraton | 0.01 | 0.03 | mg/l | (<0.50) | (<0.50) | (<0.50) | (<0.50) | BDL(~0.30) | (<0.50) | BDL(~0.30) | (<0.50) |
| 29 | Aluminium(as | 0.03 | 0.2 | mg/l | BDL | BDL | BDL | BDL | DDI (<0.01) | 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 | _ | /1 | BDL | BDL | BDL | BDL | DDI (<0.10) | BDL | DDI (<0.10) | BDL |
| 30 | Boron(asB) | 1 | 5 | mg/l | (<0.10) | (<0.10) | (<0.10) | (<0.10) | BDL(<0.10) | (<0.10) | BDL(<0.10) | (<0.10) |
| | MicrobiologicalParameter | | | | | | | | | | | |
| 1. | Escherichiacoli | | Absent/100ml | | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 2. | ColiformBacteria | | Absent/100ml | | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |

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| Applicant:-Shri. Dominic Pohrmen | |

AIRENVIRONMENT

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 (PM₁₀, PM_{2.5}, NO_Xand CO) at eight representative ambient air quality monitoring stations.

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.

Table1.7:Ambient Air Quality Status

| S.No. | Sampling | | Parameters | | | | | |
|-------|--------------|----------|----------------------|----------------------|----------------------|-----------------|------------|--|
| | Location | | PM ₁₀ | PM _{2.5} | SO ₂ | NO _x | CO | |
| | | | (μg/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 | |
| | (MineSite) | 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. | AmjajerRoko | 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 | |
| | Cimonguiniai | 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 | |

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| Applicant:-Shri. Dominic Pohrmen | |

| | | 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 |
| NAAQSTANDARDS | | 100 | 60 | 80 | 80 | 2 | |

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

| Table1.6. Ambient Noise Level Status | | | | | | | |
|--------------------------------------|------------|------------------|-------------------|--|--|--|--|
| Location | Date of | Day Time | Night Time | | | | |
| | Sampling | (6.00AMto10.0PM) | (10.00PMto6.00AM) | | | | |
| 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 | | | | |
| | Sta | andards | | | | | |
| Category of Area/Zone | | Day Time | Night Time | | | | |
| Industrial Area | | 75 | 70 | | | | |
| Commercial Area | | 65 | 55 | | | | |
| Residential Area | | 55 | 45 | | | | |
| Silence Zone | | 50 | 40 | | | | |

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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.

Table 1.9: Demography Profile of the Study Area

| S. No. | Part | ticulars | Details |
|--------|-----------------|-----------------|---------|
| 1. | No. of Villages | | 53 |
| 2. | Tota | l Population | 26,606 |
| | a. | Male | 13,221 |
| | b. | Female | 13,385 |
| 3. | No. | of House holds | 4,798 |
| 4. | No. | of Literates | 16,350 |
| | a. | Male | 8,054 |
| | b. | Female | 8,296 |
| 5. | Mai | n 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)

BIOLOGICAL ENVIRONMENT

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

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RISKASSESSMENT & 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.

Step2: Identification of persons at risk

Step 3: Removal of Hazard

Step4: Evaluation of the risk

Step5: Control measures to be taken

Step6: Maintain Assessment records

Step 7: Review

ENVIRONMENTAL MANAGEMENT PLAN

| Impact | Mitigation Measures | | |
|------------------------------|--|--|--|
| | Land Environment | | |
| Land will be degraded due to | > The total excavated area 3.50 ha., out of which 1.40 ha. will be used as | | |
| mining and dumping of waste | a water reservoir and remaining 2.10 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 (1.40ha.) | | |
| From the mine. | Will act as a water reservoir. | | |

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Inter section of ground water table during mining operations.

As per the approved Mining Plan along with PMCP, ultimate pit level (672 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 incremental ground level concentrations of particulate matter PM₁0, PM2.5, NOx & CO from the different mining activities for the study period (pre monsoon) were observed to be 6.1959μg/m³, 4.06606μg/m³, 0.142μg/m³ & 0.000223 (mg/m³) respectively.
- ➤ The resultant will remain with in 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 greenbelt/ 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. 31 local workers will get employment opportunities along with periodical training to generate local skills.
- ➤ New patterns of indirect employment/income will generate.

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- ➤ Regular health Check up 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 under taken by The lessee to minimize the impact on the surrounding environment.

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ENVIRONMENTALACTIONPROGRAMME

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

Table 1.10: Provision for Environmental Protection Measures

| S. | Description | Capital Cost | Recurring Cost |
|-----|--|---------------|----------------|
| No. | | (Rs. In Lacs) | (Rs. In Lacs) |
| 1. | Environmental Monitoring | | 2.00 |
| | (Air, Water, Noise and Soil) | | |
| 2. | Occupational Health and Safety | 1.00 | 0.50 |
| | (Initial & Periodical Medical Check-ups) | | |
| 3. | Green Belt (phase wise greenbelt | 11.0 | 1.15 |
| | development during plantation plan | | |
| | period) | | |
| 4. | Construction & Maintenance of Settling | 1.00 | 0.50 |
| | Tank, Garland Drains etc. | | |
| 5. | Provision of fencing around mine pit | 0.75 | 0.20 |
| 6. | Environmental Awareness Program | | 0.75 |
| 7. | Rain Water Harvesting | 0.50 | 0.25 |
| 8. | Socio EMP | 0.47 | |
| | Total | 14.72 | 5.35 |

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 up liftment 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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