EXECUTIVE SUMMARY

OF

ARBI LIMESTONE MINE

For Public Hearing

At

Village- Mawlong Sohpieng, Mawlong Sirdarship,
District-East Khasi Hills, State- Meghalaya
Lease Area: 2.0 ha.

Applicant: Smt. Arbibora Chyne

Address: Village- Mawlong Diengsiar,

East Khasi Hills District, Meghalaya

Environmental Consultant

INDIAN MINE PLANNERS & CONSULTANTS

GE-61, RAJDANGA MAIN ROAD

BEHIND VIVANTA HOTEL, EM- BYEPASS

KOLKATA (WEST BENGAL)

PIN- 700107

(QCI –NABET ACCREDITED ENVIRONMENTAL CONSULTING ORGANIZATION,

ACCREDITATION NO.- QCI/NABET/ENV/ACO/18/0727)

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Introduction

The Project Proponent, Smt Arbibora Chyne has applied for mining lease for minor mineral (Limestone) in her privately owned land over an area of 2.0 Ha. located at Village- Mawlong Sohpieng, Mawlong Sirdarship, District-East Khasi Hills, State- Meghalaya. The Project has been planned for a production of 70000 TPA.

The TOR from SEIAA, Meghalaya was granted vide letter No. ML/SEIAA/MIN/EKH/P-18/1229 dated 24 June, 2020 for undertaking detailed EIA study for the purpose of obtaining environmental clearance in accordance with the provisions of the EIA Notification; 2006.

In order to assess to potential environmental impacts likely to arise due to proposed Limestone Mine in Village- Mawlong Sohpieng, Mawlong Sirdarship, District-East Khasi Hills, State- Meghalaya Smt. Arbibora Chyne has retained **Indian Mine Planners & Consultants, Kolkata** to undertake Environmental Impact Assessment studies. The report envisages the assessment of the impact of various environmental components and its mitigation measures in order to minimize the adverse impacts.

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Description of the Project

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

Project Name	**Arbi Limestone Mine**
Location of mine	Village- Mawlong Sohpieng Mawlong Sirdarship District-East Khasi Hills, State- Meghalaya
Latitude	N 25°11'34.7" TO N 25°11'37.8"
Longitude	E 91° 41' 23.1" TO 91°41'39.1"E
Topo sheet number	78O/12
Land use	2.0 Ha.
Minerals of mine	Limestone
Total Mineable reserves	590501 MT
Life of mine	06 years
Proposed production of mine	70000 TPA / 280 TPD
Method of mining	Opencast, semi-mechanized
No of working days	250 days
Water demand	Total water requirement is about 4.24 KLD (0.24 KLD Domestic Uses) + 1.50 KLD (Dust Suppression) & 2.50 KLD (Green Belt) from nearby water sources.
Sources of water	Water for drinking purpose will be met from nearby villages. For sprinkling & plantation water will be taken Umium River
Man power	16 (Approx.)
Nearest railway station	Guwahati Railway Station at the distance of approx. 110 km in North direction.
Nearest airport	Umroi Airport is at the distance of approx. 64 km in North Direction.
Seismic zone	Zone V

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

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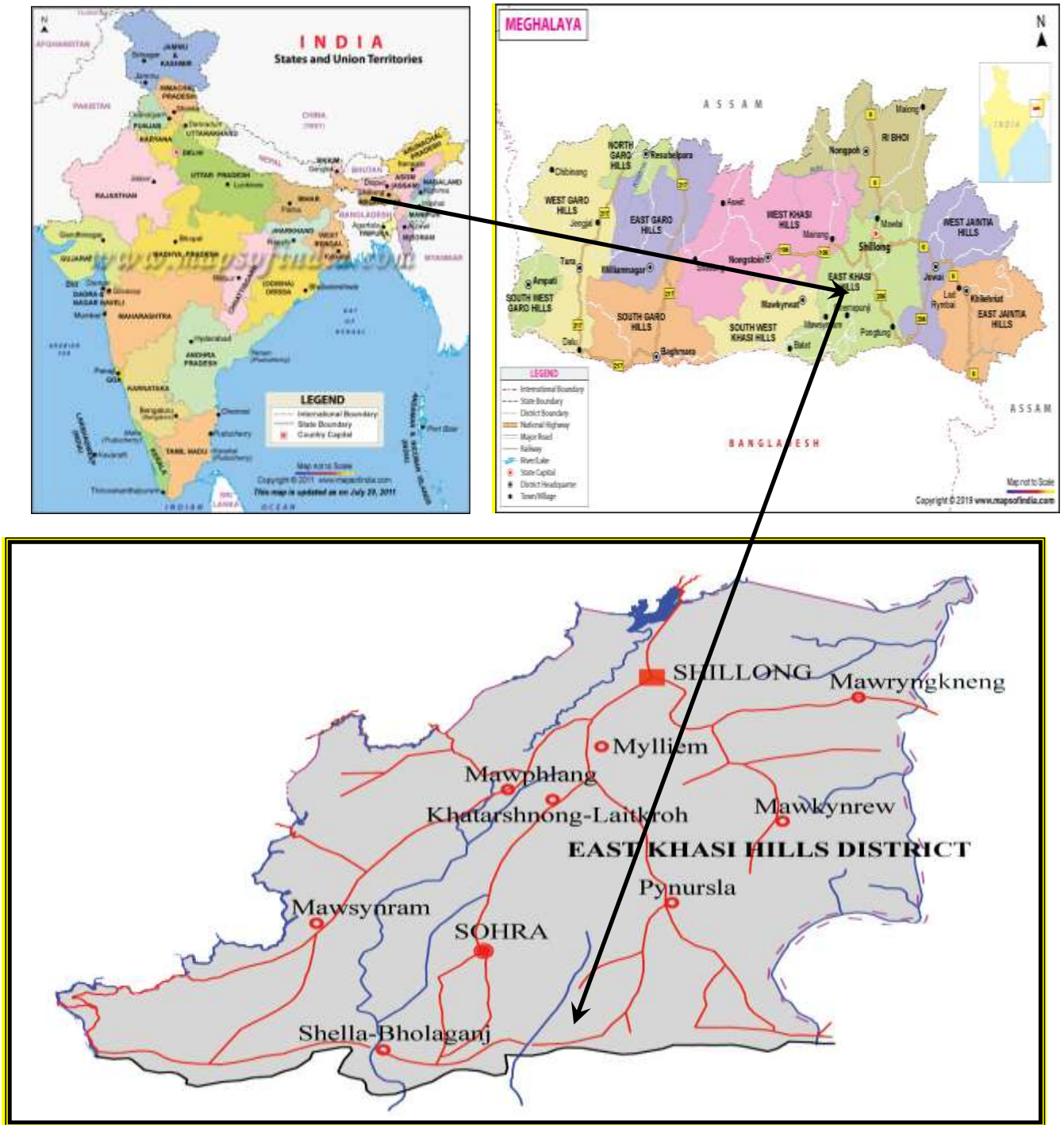

Figure 1
Vicinity Map

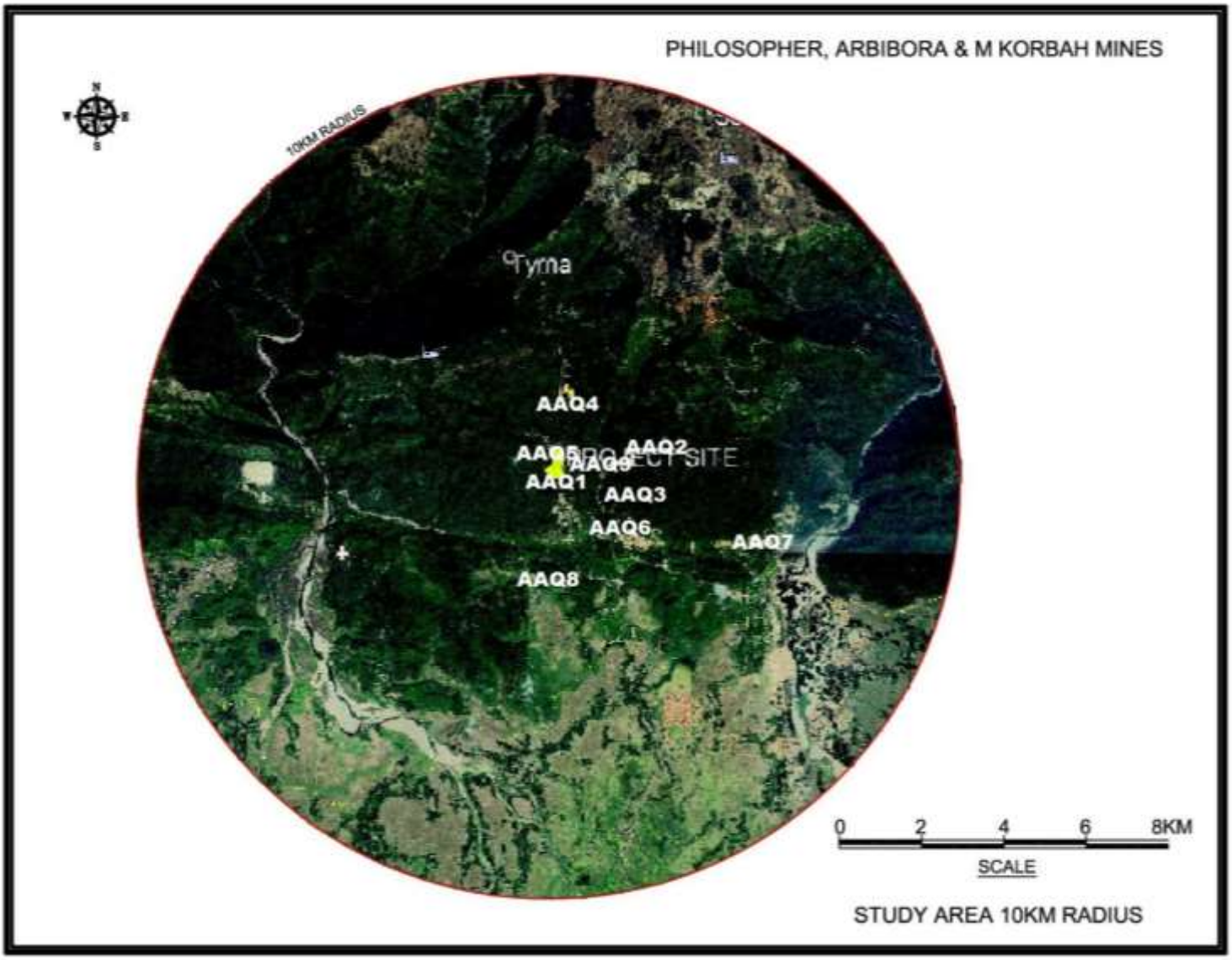

Figure 2
10 km Radius Map around the Project Site

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Basic Requirement for Proposed Project:

Details are presented below:

Sl. No	Requirement	Approx quantity
1.	HLD (Diesel)	100 liters/ day
2.	Ammonium Nitrate (Explosives)	5.43 tons of rock/kg of explosive (approx)
3.	Booster cartridge (Explosives)	

Mining Method:

- Mining will be carried out by open cast, semi-mechanized method. Approach roads, removal of soil, as well as overburden and proper stacking of the same for use in future reclamation work shall be done using excavator.
- Drilling of shot holes will be done by jackhammer machine powered by compressed air obtained from a diesel driven Air Compressor machine.
- Blasting of the shot holes will be done using explosive cartridges of size 25 mm x200 mm and detonation of the charges will be carried out using detonators which are connected to an electric exploder.
- Secondary drilling and blasting will not be taken up in that place for secondary breaking hydraulic rock breakers will be deployed.
- To avoid fly rock problem at the edge of the hill, light charged muffle blasting shall be under taken.
- The blasted material shall be collected by excavator and loaded to dumpers or trucks for dispatch to the required destination, except the oversize boulders (>350 mm) which have to be broken to smaller size manually using sledge hammer or by rock breaker.

Description of the Environment:

The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, Land and Socio-economic were generated during December 2019 to February 2020 in the study area covering 10 km around the proposed Limestone Mine. Other environmental data on flora and fauna, land-use pattern, forest etc were also generated through field surveys and also collected from different State Govt. Departments.

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Air Environment:

Ambient air quality was monitored at 9 locations. Results indicate that concentrations of PM2.5, PM10, SO_2, NOx are well within the prescribed standards.

PM_{10}- 55-89 µg/m^3

$PM_{2.5}$- 21-34 µg/m^3

SO^2- 4.1-7.6 µg/m^3

NO_x- 6.8-10.7 µg/m^3

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

Noise Environment:

The noise levels in the study area are within the prescribed standards. Noise levels ranges from 53.6 dB (A) to 56.7 dB (A) during day time and 38.5 dB (A) to 41.6 dB (A) in the night time.

Water Environment:

It has been observed that all the physico-chemical parameters and heavy metals of water samples from surface and ground water are below the stipulated drinking water standards. The pH, TDS, and Hardness of the surface water were found in range of 6.90-7.10, 107.0-111.0 mg/land 81.30-74.30 mg/lit respectively, whereas the ground water showed pH 6.90-7.30, TDS 99.0-117 mg/lit.

Land Environment:

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

Breakup of Land Use

S No.	Category	Existing Area (in Acres.)
1	Agricultural	NIL
2	Mined Out Area	NIL
3	Mineralized area (Barren)	4.94
	Total	**4.94**

Soil:

The soil quality assessment was carried out at seven locations. The bulk density of the soil in the study area ranges between 1.43 to 1.60 gm/cm^3, which indicate favorable physical condition for plant growth. Variation in the pH of the soil in the study area were observed and it is found to be neutral (6.8 to 7.20), thus conducive for growth of plant. Organic carbon and nitrogen are found in the range of 0.66-0.79 % and 0.88-1.21 %. This shows that soil is moderately good in organic and deficit in nitrogen contents. Primary nutrient profile shows that soil is low in fertility due to the availability of low amount of nitrogen and potassium.

Flora & Fauna:

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

Socio-economic Status:

The study has been conducted by primary survey and secondary data source from Census of India 2011.

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

- **Core Zone**: There is no habitation in the core zone
- **Buffer Zone**: The total number of Households of the study area in rural village area are 10329 as per Census 2011. The details are given below.
- **Population:**

The total population of the study area is 52787 constituting 26618 Male and 26169 Female.

- **Social Structure**

The proportion of Scheduled Caste (SC) population within the study area is 4.21 % and the percentage of schedule Tribe (ST) is 81.83%.

- **Literacy**

The total proportion of literate within the study area is 60.76% of total population. In percentage the male literacy 31.25% and the female literacy is 29.51% respectively within study area.

Anticipated Environmental Impact & Mitigation Measures:

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

- To minimize the effect of mining plantation will be in done along the 7.5m boundary of the mine area and after the exhaustion of the pit whole area will be reclaimed into green cover. After the conceptual mining there will be a mine void which will be extensively planted.
- Mining operations will be confined strictly within the demarcated area.
- The dust generation due to the mining will be minimized by sprinkling of water through water sprinkler.
- No effect on public buildings or monuments is envisaged as there are no public buildings/ monuments in the close vicinity of the mining lease area.

2. Water Environment: Total water requirement in the proposed mining project is 4.24 KLD. Dust suppression shall be done by collecting operational pit water collected during rain. Drinking water will be sourced by from nearby villages by water tanker. Mining will be restricted up to a depth of 48 m. There is no possibility of mining encountering any surface/subsurface water body. To avoid contamination of ground water from the open defecation by workers, toilets will be provided for the workers at site with septic tank followed by soak pit.

3. Air Environment: The air borne particulate matter is the main air

pollutant contributed by opencast mining with drilling and blasting. Various emission sources are identified from the proposed mining operations. However the area will be reclaimed by the following measures:

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

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

5. **Biological Environment:** There is no Forest area diversion is required in the proposed mining. The fauna in the vicinity of the mine is restricted to few common species. There will hardly be any negative impacts on terrestrial eco-system comprising birds and animals as the ML area is only 2.499 Ha. On the contrary, with progressive growth of greenery, terrestrial eco-system will improve in course of time. There will be no Schedule-I species found in study area.

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

7. **Mine Waste:** Mine waste, alluvial soil and overburden will be stacked at

separate stack yard and will be use for road construction and plantation. Alluvial soil generated shall be re used for plantation. Mining shall not be done during rains and there shall be construction of retaining wall and garland drain to prevent surface runoff. Hazardous waste such as used oil shall be stored properly and sold to registered-processor. Domestic waste water due to daily human activities which shall be properly disposed off into septic tanks followed by soak pits. Other domestic solid waste such as Wrappers, foils, left- over food material etc shall be collected in separate bins. Biodegradable waste will be composted and used as manure.

8. Impacts due to transportation: The entire mineral will be transported to the Cement plant through trucks. Transportation shall be done by 4 no. of 10 tonner trucks. As per study done there will not be any congestion due to proposed project on the road.

Environmental Monitoring Programme:

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

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

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

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

Project benefits: The proposed mining project has a significant positive

impact on the socio-economic environment and it will help sustain the overall development of the area.

The proposed project significantly contributes the economic development by providing direct employment to 16 people and indirect employment to many more people in the area.

PP will organize Camps for vocational training to generate employment.

Environmental Management Plan: Preparation of Environmental Management Plan (EMP) is required for formulation, implementation and monitoring of environmental protection measures during and after commissioning of the proposed mining project. The project cost is Rs.85.00 Lakh and the EMP capital cost Rs. 4.60 Lakh (Annual recurring cost).

Budgetary Provision for Environmental Measures:

Sl. No.	Particulars	Annual Recurring Cost (Rs in Lakhs)
1.	Monitoring of Atmospheric Air, Surface Water, Noise Level (By External Agency)	1.20
2.	Maintenance of Green Belt	0.60
3.	Reclamation of degraded Land	1.20
4.	Staff Salary	1.60
	Total	**4.60**

Corporate Social Responsibility:

Being a corporate citizen the company has the responsibility of contributing to the welfare of the society in which it operates. The company will organize various awareness programmes for its employee and the general public of the area where it operates to ensure a better, sustainable way of life for the weaker sections of society.

Budgetary Provision for CSR Activity

ACTIVITIES	COST (In Rs)
School infrastructure including furniture, books, Computer, sports kit to Ichamati RMSA Secondary School.	1,00,000.00
School dress to 60 students of Ichamati RMSA Secondary School	50,000.00
Maintenance & Construction of village roads	2,00,000.00
Medical camp & free medicines to poor	20,000.00
Water supply arrangement & sanitation for local villagers	60,000.00
Total	**4,30,000.00**
Total for five years i.e. 5%of project cost	**4,25,000.00**

Occupational Health and Safety:

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

Green belt development: It has been initiated by the proponent 3.15 Acres will be planted at the end of mine life. Locally thriving species will be planted in consultation with forest department.

Among other environmental protection following measures are listed below:

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