

EXECUTIVE SUMMARY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT UNDER VIOLATION CASE

LIMESTONE MINE

**S.F.No:24/1F, 29/2B, 2F, 34/1 to 34/13,
over an extent of 4.09.5 Ha of Pandapuli Village,
Sankarankovil Taluk, Tirunelveli District,
Tamil Nadu**

Project Cost – Rs 67, 78,025

EMP Cost – Rs.6 Lakhs

M/S. Murali Enterprises,

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EXECUTIVE SUMMARY

M/s. Murali Enterprises of Limestone Mine over an extent of 4.09.5 Ha, in S.F. Nos. 24/1F, 29/2B, 29/2F, 34/1 to 13, is located in Pandapuli village of Sankarankovil Taluk, Tirunelveli District. The area is marked in the survey of India (SoI) Toposheet No.58 G/11. The area lies between northern latitude of 09° 19' 42.5" N to 09° 19' 50.2" N and eastern longitude from 77°32' 53.6" E to 77° 33'59.5"E. Initially the mining lease was granted in favour of M/s. Lovely chemicals vide G.O. (3D) No 85 INDS MMD2, dated 23.06.1998 for a period of 20 Years (14.12.1998 - 13.12.2018). Then the lease was transferred to S.A.Murali, Proprietor, M/s. Murali Enterprises vide G.O. (3D). No 131 dated 26.12.2005. Since the Scheme of Mining expired on 31.03.2015, the final scheme of mining [2015-16 to 2018-19 (up to 13.12.2018)] along with PMCP was submitted to Indian Bureau of Mines for approval under Rule 12(2) & 23 (B) of MCDR, 1988 and approved by IBM vide Letter No. TN/TNL/LST/MS-1162.MDS dated 14.11.2015.

The ministry has issued another Notification No. S.O 1030 (E) dated 08.03.2018 that the projects/activities covered under category 'B' shall be considered by SEAC/SEIAAs in the respective states. In view of the above the proponent submitted the application to SEIAA/SEAC on 02.04.2018. Hence, the proposal has been placed in 107th STATE EXPERT APPRAISAL COMMITTEE MEETING ON 13th APRIL 2018 and granted Terms of Reference vide Lr.No. SEIAA-TN/F.No.6174/TOR-442/2018 dated 14.05.2018 for preparation of EIA/EMP report, Ecological Damage Assessment, Remediation Plan, Natural Resource Augmentation and Community Resource Augmentation for obtaining an Environment Clearance from SEIAA/SEAC, Tamil Nadu.

1.0 DETAILS OF THE MINING AREA

A) The area is marked in the Survey of India Topo Sheet No.58G/11.

G.O. Order No	Date of grant	Extent (Ha)	Date of Execution	Period of Lease	Date of expiry
G.O.(3D).No: 85/Industries (MMD.2)	23.06.1998	4.09.5	14.12.1998	20 years And continue for 50 years as per amended MMDR Act,2015	13.12.2018 And deemed to continue up to 13.12.2048

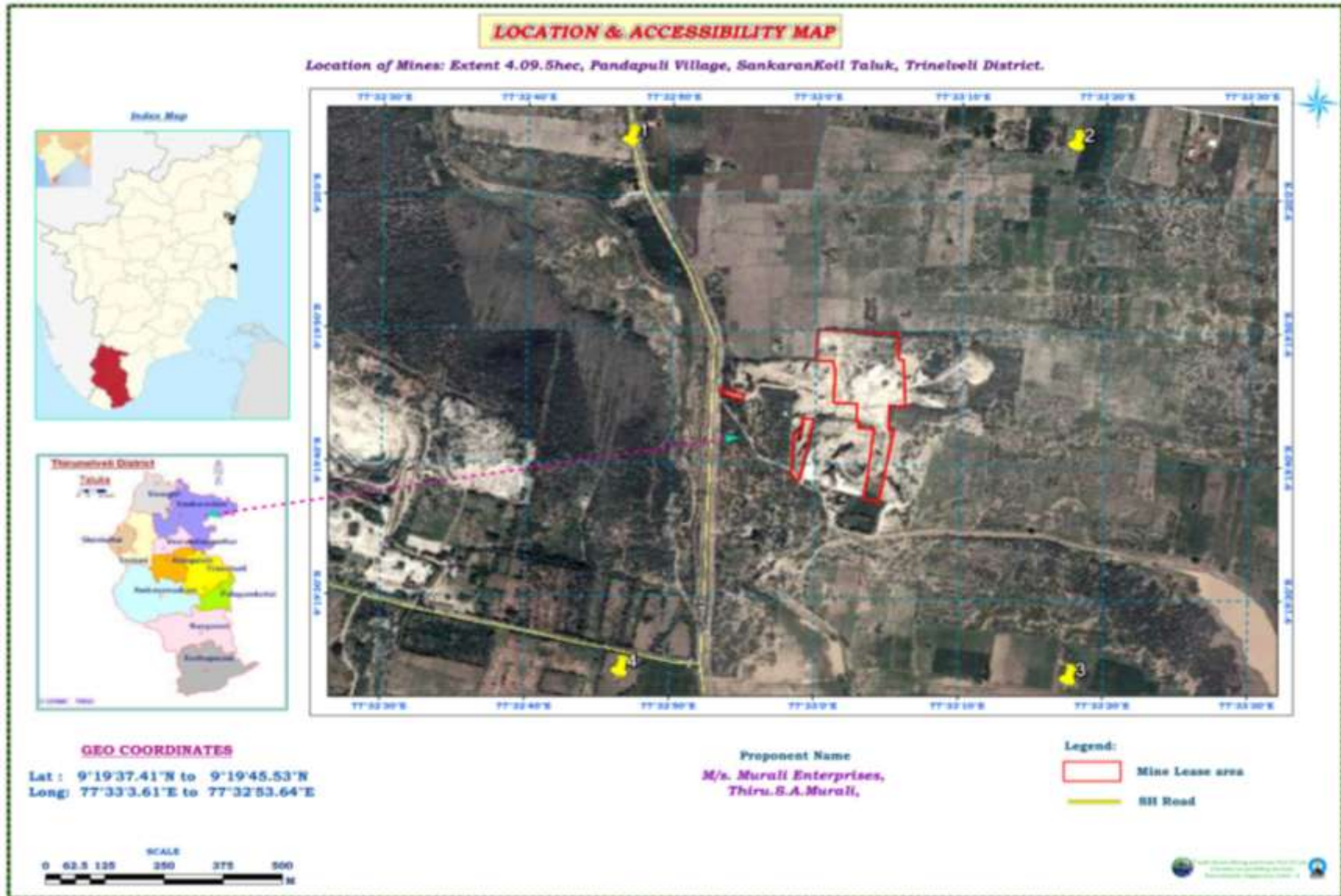


Fig. 1: Study Area

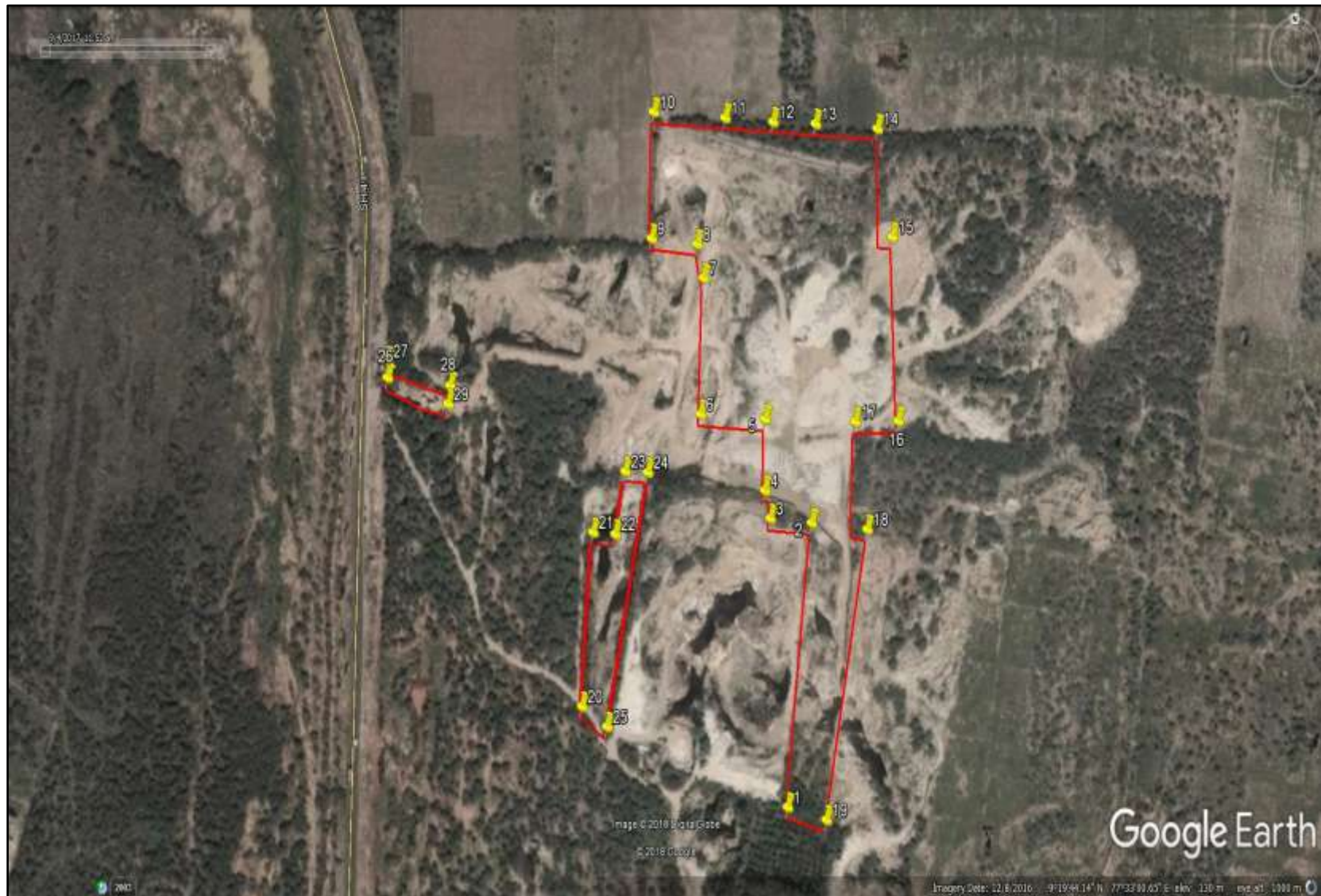


Fig.2: Google Earth Showing Lease Boundary of the Existing Mining Area

Table 1: Environmental Sensitivity

Details of the study area		
Latitude	09° 19' 42.5" N to 09° 19' 50.2" N	
Longitude	77° 32' 53.6" E to 77° 33'59.5"E	
SOI Toposheet	Top sheet No. 58 G/11	
Topography	Flat terrain with a gentle slope towards 80° South to Vertical	
Ownership/Occupancy	Patta land	
Village	Pandapuli	
Taluk	Sankarankoil	
District	Tirunelveli	
Accessibility		
Nearest Village	Puthukkal – 2 km - 3087 (Population)	
Nearest City	Town	Rajapalayam - 16 Km
	City	Tirunelveli - 75 Km
	District Head Quarters	Tirunelveli
Nearest Highway	State Highway –SH-41- 16(NE)	
Nearest Railway Station	Sankarankoil Railway Station – 16km (S)	
Nearest Airport	Tuticorin Airport – 125km (SE)	
Important Places		
Interstate Boundary	There is no interstate boundary located within 10 km radius.	
Archaeologically Important Site	None within 10km radius.	
Nearest water bodies/river/sea	One Kanmoi is located within 500m radius west side.	
National Parks/Wildlife Sanctuaries	There is no wild life sanctuary/National park within 10 km radius from the project site area under the Wildlife (Protection) Act, 1972.	
Reserve Forest	There is no Reserve forest situated around 10 km from the site. Hence the area does not attract the Forest Conservation Act, 1980.	
Coastal Zone	The mining area is located more than 100 km from sea coast.Hence, the project doesn't attract the C.R.Z. Notification, 1991.	
Habitations	Thangayur	4km (North)
	Pandapuli	2km (South)
	Manjakalipatti	3km (East)
	Kidayur	3km (West)
Nearby Quarries	2 quarries are found in the core zone	
Seismic Zone	Zone III	
Defense Installations	None within 15km radius	

2.0 PROJECT DESCRIPTION

2.1. Topography

The mining lease area is almost a flat Area. Elevation is 143m above MSL. An average of 1-2m height from the ground level. The limestone deposit is partly concealed below the morum soil of about 1-2m thick. This area is bestowed with varied agro climatic condition from semi-arid to sub-tropical supporting varied agro eco systems, conducive for the cultivation of wide range of agricultural and horticultural crops. No major river is found nearby. A small pond is found nearby the site.

2.2. Geology

Tirunelveli district of Tamil Nadu is the southern part of the Indian Precambrian shield comprising a wide variety of geological formations ranging from Precambrian to recent period. Major portion of the district is covered by plain topography. North West and western portion of the district are gently sloping to undulating. Different types of Charnockites rocks and Meta sedimentary gneissic formation are distributed throughout the Tirunelveli District. They can be divided into granitoid, non-garnetiferous mica, Hornblende gneisses and mixed gneisses associated with migmatite.

There is migmatite assemblage of garnetiferous biotite gneisses (Khondalitic) and garnetiferous quartz-feldspathic granulites. The major litho-stratigraphic units in the study area of limestone are available at several places in the district. The limestone is crystalline deposit Ramayanpatti, Thalaiyuthu, Padmaneri and Pandapuli area. The tertiary formation over lies the Archaean complex with marked unconformity, consist of calcareous sandstone and shale limestone. These are medium to fine granied, compact in nature. The thickness of the formation varies from few meters to few tens of meters.

2.3. Method of Mining

Open cast mining by other than mechanized mining is adopted to raise the production in this area. As the mineral occur as outcrops and exposed mostly in working pit as well as at the surface and hence there is no separate development work involved except side burden to win the mineral. Drilling is carried out using hired tractor attached with compressor and their team and blasting carried out departmentally with qualified blaster\Manager. The Limestone is broken into the required size and sorted out in to various grades based on color and size. The rejects and waste are being removed manually using tippers. The useable minerals are transported to their cement factory or crushing plant in accordance with grade. The cement grade limestone is transported to Ramco cement factories, Tirunelveli for using public carriers on hire basis.

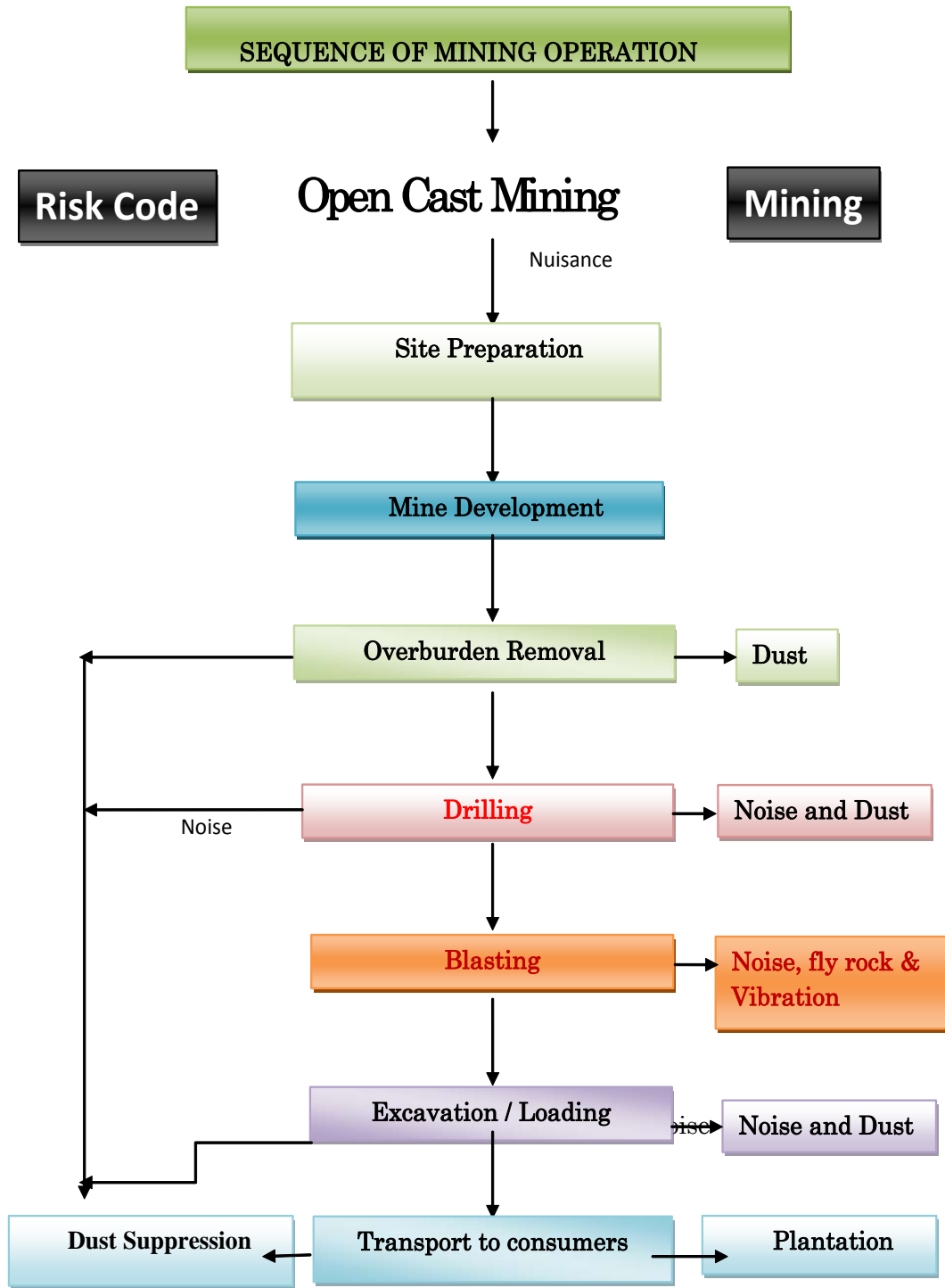


Fig 3: Methodology

2.3.1. DRILLING

Drilling of shot-holes will be carried out using compressor and Jack Hammers combination. Depth of holes shall be 1-2m. The spacing shall be 0.75m and burden shall be 0.60m from the preface. To achieve a correct blasting geometry certain amount of trial blast is prerequisite to effect a perfect pre-determined fragmentation and fly rock control. In case of heavy blasting qualified mine manager has to be appointed for proper calculation of powder factor and control blasting sequencing and arrangement of explosives etc.

2.3.2. BLASTING

The limestone deposit is moderately hard in nature like the country rock and therefore they will be broken into pieces of portable size by drilling and blasting using Jack hammer with compressor by shot hole blasting. Powder factor of explosives for breaking such hard rock shall be in the order of 5 Kgs .of explosives. Blasting parameter being adopted for shot holes is,

Depth (m) * Burden (m)* Spacing (m)	= Volume (Metric tonnes)
1.00 x 0.60 x 0.75	= 0.45 Metric tonnes
Quantity of rock broken	= 0.45 x 2.6 1.17 MT
Blasting efficiency @90% = 1.17 x 90%	= 1.05 MT/hole
Charge per hole shall be	= 140 gms of 25 mm dia cartridge.
Quantity of rock broken per day	= 50.74M.T.
Requirement of explosives per day	= 5 Kgs
	@ 10 M.T. per Kg of explosives
No. of holes to be drilled per day	= 27.16/1.05= 48 Holes/ day

2.3.2.1. Blasting Parameters

Blasting is done to keep the bench height 6m. Shot holes blasting using Jack hammer 32mm dia followed by manual breaking are adopted to release the mineral. Powder factor of explosives for breaking such hard rock shall be in the order of 5-6 tons per k.g. of explosives. Blasting parameters adopted for shot holes are given below.

	Jack Hammer
Dia. Of hole(m)	32mm
Depth Of hole(m)	1-1.5m
Spacing(m)	1.0
Burden	0.9
Charge per hole	125 gm of 25m dia cartridges

2.3.3. LOADING

Loading of Limestone is being carried out with the help of 1 Hydraulic excavator and 2tippers for internal transport of rejects from the working face to the dumps. Loading machines of Hydraulic Excavator are given in table 1.2

2.3.4. HAULING/TRANSPORT

Tippers of 10MT capacities are being used for transport of limestone from site to nearest dump yard as shown in the ROMP. Transportation also includes movement of service vehicles also in the mine lease area. However, this is more of a localized phenomenon within the mining areas that have limited human exposure and being worked with safety guidelines provided by the Director of Mines Safety. The mode of transport of the Limestone produced and marketed is by road of various consumer destinations and limestone processing units located at different parts of the country. Transports of machines are given in the Fig No.2.11 (b).

2.4. MINING MACHINERY

Mechanized working for loading and hauling area undertaken with excavators/loaders and hauling units. Machines details are given in Table No.1.2.

Table: 2 Details of machinery existing mine

Type	Nos.	Dia. Of Hole	Size/Capacity Make	Make	Motive Power	H.P.
Jack Hammer with portable ford compressor	2	32mm	7 Kgs/m ³ XA 175	Atlas Copco	Diesel	45
Hydraulic Excavators	1	----	1.2.m3	L&T or Ex200	Diesel	120
Compressor(Hire)	1	450 cfm	10.5Kgs/cm ² 450 Cfm	XA176 – 1No	-	180
Tipper(Hire)	2	---	10MT	Ashok Leyland	Diesel	110

2.5. Method of Estimation of Reserves

All reserves are calculated by cross-sectional method. All plans & sections are prepared with uniform standard scale for every block wise in 1: 1000 horizontal and 1: 500 is vertical. The recovery percentage is arrived at 70% out of total ROM in view of well exposed outcrops over the mine benches and based on actual recovered production from these workings. The

details of limestone reserves under UNFC Classification are given in Table No.2.4&1.3.

Table: 3 Mineral Reserves and Resources

Mineral Reserves and Resources	Recoverable Resources 70% (m ³)	Total Qty ROM (MT)	Recoverable Resources (MT) 70%	UNFC code
a) Total Mineral Reserves (Mineable) i) Proved (140-123m RL) (G1,F1&E1axes)	142407m ³	356018MT	249212MT	111
b) Mineral Resources i) Mineral Resources Loss in Benches (G2,F1&E1 axes)	17178m ³	42945MT	30062MT	221
ii) Mineral Resources Loss in 7.5m Safety Barrier (G2,F2&E2 axes)	4474m ³	11184MT	7829MT	222
Total Mineral Reserves and Resources	164059m³	410147MT	287103MT	

2.6. PRODUCTION

The production Schedule for the ensuring five years is drawn mainly in consideration of reserves position, market demand, men and machinery deployed and the cost of production. The mineable reserves of the limestone deposit in this mine are sustainable for period above 20 years. The mined out limestone will be used exclusively for captive consumption as much as the reserves is sustainable for years and the markets potential is sound, it is proposed to achieve a maximum production capacity of 15295MT per annum. The men machinery proposed is compatible to meet the above production targets. The year wise productions on limestone for the past years are given in table 1.4. &1.5

Table No :4 Year wise Development for 2018-2023

Year	ROM (MT)					Waste Ratio
	Total Tentative Excavation (MT)	Top soil (MT)	Production @ 70%(MT)	Mineral Rejects @ 30%	Waste (MT)	
2018-19	21840	1947	15288	6552	5320	1 : 0.90
2019-20	21840	---	15288	6552	---	1 : 0.42
2020-21	21600	---	15120	6480	---	1 : 0.42
2021-22	21850	---	15295	6555	---	1 : 0.42
2022-23	21600	---	15120	6480	---	1 : 0.42
Total	108730	1947	76111	32619	5320	1 : 0.52

Table: 5 Year Wise Production Details

Sl.No	Year of Production	Production proposed in Mining period in MT	Actual production achieved in MT
First Grant of Lease(M/s Lovely Chemicals)			
1	1998-1999	No Mine Plan	983.385
2	1999-2000	No Mine Plan	291.210
3	2000-2001	No Mine Plan	28.490
4	2001-2002	No Mine Plan	24.665
5	2002-2003	No Mine Plan	19.905
Second scheme of mining			
6	2003-2004	Lapsed scheme of mining	21.250
7	2004-2005		Nil
Second Grant of Lease (M/s.Murali Enterprises)			
8	2005-2006	3958	-
9	2006-2007	5503	2402.95
10	2007-2008	5503	4424.17
Third scheme of mining			
11	2008-2009	5503	4100.33
12	2009-2010	5503	3217.750
13	2010-2011	5503	5632.560
14	2011-2012	1835	8307.760
15	2012-2013	1835	5808.030
Fourth scheme of mining			
16	2013-2014	1835	5300.500
17	2014-2015	1835	8867.770
18	2015-2016	12776	11023.390
19	2016-2017	12303	4014.170
20	2017-2018	-	-
Fifth Review of mining plan			
21	2018-2019	15288	-
22	2019-2020	15288	-
23	2020-2021	15120	-
24	2021-2022	15295	-
25	2022-2023	15120	-

(*From 1st January 2017 Mining Stopped due to EC)

2.7. Employment Potential

The following man power is proposed for the Limestone mine to look after and carryout the day – to – day mining activities aimed at the proposed production target and also to comply with the statutory provisions of the Metalliferous Mines Regulations, 1961. The Employment Potential is tabulated in Table 1.6.

Table No: 6 Man Power

Description	No. of Person
Mining personnel	
Mines Manager	1
Asst. Mines Manager	1
Mining Engineer	Nil
Mines Foreman	1
Staffs	3
Labour Skilled-Semi Skilled and Un-Skilled = 28 Persons on Contract	28
Total	34

The above man power is adequate to meet out the production schedule and the machinery strength envisaged in the ROMP and also to comply with the statutory provisions of the Mines Safety Regulations.

2.8. Water Requirement

Presently M/s.Murali Enterprises is using about 3KLD/day of water. Water the labours will be provided initially with drinking water by purchasing from markets & for permanent solution, a bore well will be drilled to provide drinking water, water sprinkling & green belt. No waste water generated from this mine. Total Water requirement is 3.0KLD.In that, i) Drinking and utilities shall be 1.0KLD ii) Water for Dust suppression& Drilling 1.KLD. and green belt shall be 1.0KLD.

2.9. Power and Fuel Requirement

12 litre diesel per hour for excavator for mining and loading, a tractor mounted compressor for drilling with diesel capacity of 5 lit per hour are used. Single face current will be obtained from TNEB for lightning, dewatering from bore well. A 5 HP diesel pump will be kept as spare for dewatering rainy water during rainy season.

2.10. Mine Drainage

There are no perennial water sources within the lease hold area. A few Ponds are situated about 68meters and 45meters away on western and southern sides respectively. No pumping is required to pump out ground water as the mining extends only 20m of depth and the ground water is found to be fluctuated between 30-32mts in a year. There is no impact on natural drainages from this mine and SRTM data using Drainage pattern of 10km radius is shown in fig No.2.7.

A diesel engine with 5 H.P capacities is kept at the mine site to meet any eventuality of bailing out the rain water to the natural drainage outside to carry out the mine working uninterrupted. Dust suppression and green belt is obtained from proponent bore wells. There is no acid drainage or any toxic elements reported.

2.11. DISPOSAL OF WASTE

The only waste likely to be generated is topsoil and side burden waste. The lease area is covered with a thin soil cap here and there with 0 to 0.3 m thickness. The top soil generation for the next five year is 1947MT. Details of pit and dump dimensions are given in the ROMP. Dumps are properly terraced and non-active portions are afforested systematically. Ultimate pit slope shall be 45 degrees and height of benches shall be maintained as 6m. After completion of mining the pit will be back filled to a maximum for afforestation. The swell factor is assessed as 30% out of total excavation of materials. Garland drainage and stone parapet have to be constructed from western boundary up to the proposed sump. Dump dimension (m) for the next year is given in Table No. 1.7.

Table: 7 Dump Dimension for the next five year

Description	Quantity(MT)	Volume(m ³)
Topsoil	1947MT	1298m ³
Reject & Weathered rock(60mX40mX9.892m X1.68m)	37939MT	15176m ³
TOTAL	39886MT	16474m³

2.12 Cost of the project

A) Project Cost

- i) Land - Rs. 15,00,000
 - ii) Building - Rs. 4,00,000
 - iii) Mining tools - Rs. 1,50,000
 - iv) Machineries - Rs. 45,00,000
 - v) Others- Amenities - Rs. 2,28,025
- Total project cost - Rs 67,78,025.**

B) EMP Cost - Rs 6 Lakhs

3.0 BASELINE STUDY

Baseline Environmental Studies have been conducted to determine the existing status of various Environmental attributes viz., Climatic and Atmospheric Conditions, Air, Water, Noise, Soil, Hydro geological, Land use pattern, Ecological and Socio-Economical environment, prior to setting up of the project.

An area, covering a 10km radial distance from the project site is considered as the study area for the purpose of the baseline studies. As part of Environmental and Social Impact Assessment, this study was undertaken for a period of three months from December 2017 to February 2018.

3.1. AIR ENVIRONMENT

Ambient air quality of the study area has been assessed through a network of 5 ambient air quality locations.

The ambient air quality mentioned in the study area was found to be well within the limits of NAAQS standard prescribed for Residential, Rural and other area.

Table 8: Summary of Ambient Air Quality

Location	Code	PM ₁₀ (µg/m ³)				PM _{2.5} (µg/m ³)			
		Max	Min	Avg	98%	Max	Min	Avg	98%
Lease area of M/s.Murali Enterprises	A1	56.98	54.33	55.52	56.92	31.65	29.45	31.11	31.46
Panthapuli	A2	52.02	48.55	50.67	51.84	25.85	22.56	25.28	25.81
Reddiyapatti	A3	50.1	48.35	49.71	50.1	26.2	24.85	25.73	26.
Arungakulam	A4	50.23	44.95	49.54	50.17	25.3	23.68	25.01	25.23
Solaiseri	A5	50.96	46.26	49.59	50.60	25.48	24.3	25.11	25.39
NAAQS		100				60			

Location	Code	SO ₂ (µg/m ³)				NO _x (µg/m ³)			
		Max	Min	Avg	98%	Max	Min	Avg	98%
Lease area of M/s.Murali Enterprises	A1	6.92	6.1	6.76	6.90	8.7	7.1	8.39	8.7

Panthapuli	A2	6.95	6	6.51	6.86	7.95	7.05	7.45	7.76
Reddiyapatti	A3	5.95	4.95	5.56	5.85	7.89	7.03	7.48	7.77
Arungakulam	A4	6.02	4.75	5.56	6.01	6.95	5.48	6.72	6.93
Solaiseri	A5	5.95	4.85	5.72	5.93	6.96	5.96	6.67	6.96
NAAQS		80				80			

3.2. NOISE ENVIRONMENT

Five monitoring locations were selected to assess the noise levels in the study area. Noise levels recorded were found to be in the range of 40.4-45.4 dB (A) during daytime and in the range of 36.1-38.2 dB (A) during night time.

3.3. WATER ENVIRONMENT

Five ground water samples each were collected from in and around the study area. The parameters thus analyzed were compared with IS-10500. All the samples were found to be well within the limits.

3.4. SOIL ENVIRONMENT

Five soil samples were collected within 10 km radius distance of the study area and were analyzed to study the soil quality.

4.0 ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

4.1. AIR ENVIRONEMT

The air borne particulate matter is the main air pollutant contributed by opencast mining. The mining operation will be carried out by adopting semi-mechanized methods which involves drilling, blasting, wire-saw cutting, excavation, loading and unloading.

4.1.1 Anticipated Impact

The impacts on air environment from a mining activity depend on various factors like production capacity, machinery involved, operations and maintenance of various equipment's and vehicle. Apart from these, there will be other activities associated viz transportation of mineral and waste, stocking facilities and dump management within the mine lease area that may contribute to pollution.

4.1.2. Mitigation Measures

Dust is the major pollutant generated from the mining operations. Monitoring of air quality is conducted periodically to ensure that the contribution of dust and other components is kept within permissible limits. The pollutants from nearby ongoing mining activities, residential and commercial activities are the primary sources of air pollution. However, in the study area adequate control measures will be implemented in future at the time of mining operation. Mitigative measures suggested for air pollution controls are based on the baseline ambient air quality of the area. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that air quality is monitored on a regular basis to check compliance of standards as prescribed by regulatory authorities. In case of non-compliance, appropriate mitigative measures need to be checked.

The following dust prone sports are identified for adopting proper control measures in the mine area:

- Blasting
- Drilling
- Excavation
- Loading operation
- Transportation of limestone

The environmental control measures to control the fugitive dust released are given below

- Wet drilling to suppression the dust emission from the drill machines at its sources by inbuilt water injection system.
- Regular Water sprinkling on haul roads, blasted heaps, service roads and overburden dumps at regular intervals will help in reducing considerable dust pollution
- 100litres / day of water will be used for dust suppression operations at mine.
- Avoiding blasting during high windy periods, night times and temperature inversion periods.
- Proposed to follow up muffle blasting so as to prevent fly limestone fragments.
- Use of sharp drill bits for drilling holes and arrangement for bit regarding. Charging the holes using optimum charge and using time delay detonator.
- Use of adequate booster/primer and Proper stemming of the blast hole
- The vehicles and machinery will be kept in well maintained condition so that emissions will minimize
- Regular grading of haul roads and service roads to clear accumulation of loose material.
- Avoiding overfilling of tippers and consequent spillage on the roads.

- The vehicles and machinery will be kept in well maintained condition so that emissions will minimize.
- Afforestation for control of dust. To arrest the amount of airborne dust, plantation is being carried out within the mines.
- Information on wind direction and meteorology will be considered while planning, so that pollutants, which cannot be fully suppressed by engineering technique, will be prevented from reaching the residential areas
- Cabins for shovel and dumpers and dust masks to workmen will be provided
- The dust respirators should be provided to all workers working in dusty environment
- Regular health check-up of workers and nearby villagers in the impacted area should be carried out by Applicant and also regular occupational health assessment of employees should be carried out as per the Factories Act
- Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air.

4.2. NOISE ENVIRONMENT

Noise survey has been conducted in the study area to assess the background noise levels in different zones. In order to assess the baseline noise levels, impact of noise assessment around the mine site due to mining machineries on its workers and on the nearby settlements and movements of vehicles during transportation have been carried out exclusively and objectively in the core and buffer zone covering 10km radius in 5 locations.

4.2.1. Anticipated Impacts due to Core Zone

Noise will be produced during operational phase of mining due to drilling, blasting, compressors and movement of vehicles. Since, the mining and allied activities will take place only during day time, the increase in noise levels will be only during day time. Detrimental effects of noise pollution are not only related to sound pressure level and frequency, but also on the total duration of exposure and the age of the person. The adverse effects of high noise levels on exposed workers may result in Annoyance, Fatigue, Temporary shift of threshold limit of hearing, Permanent loss of hearing and Hypertension and high blood cholesterol, etc.

4.2.2. Anticipated Impacts due to Noise in Buffer Zone

The day time noise levels at all locations of buffer zone were observed to be in the range of 40.4-46.7 dB (A) and observed to be well within the prescribed limit of 55 dB(A) for residential area. The night time noise levels at all locations of buffer zone were observed to be in the range of 36.1-38.2 dB (A) and observed to be well within the prescribed limit of 45 dB(A) for residential area. The monitored noise level during the baseline data generation

period within the selected villages in buffer zone was found to be within the prescribed CPCB standards which will further be reduced when more plantations within the mining area especially in the direction of habitation will be undertaken by the proponent.

4.2.3. NOISE POLLUTION CONTROL MEASURES

The following noise abatement measurements are proposed for control of noise:

- Proper and regular maintenance of vehicle, machinery and other equipment.
- Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas.
- Carrying out blasting only during day time and not on cloudy days.
- Limiting time exposure of workers to excessive noise.
- The noise generated by the machinery is reduced by proper lubrication of the machinery and equipment.
- Speed of trucks& Tippers entering or leaving the mine will be limited to moderate speed to prevent undue noise from empty vehicles.
- Carrying out blasting only during day time and not on cloudy days.
- Noise levels will be controlled by using optimum explosive charge, proper delay detonators and proper stemming to prevent blow out of holes.
- Providing proper noise proof enclosure for the workers separated from the noise source and noise prone equipment
- Provision of Quiet areas, where employees can get relief from workplace noise.
- The development of green belts around the periphery of the mine to attenuate noise.
- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.

4.3. WATER ENVIRONMENT

The mining lease area is almost a flat terrain. No perennial rives are located within the mining lease area.

Mining operations can affect groundwater quality in several ways. The most obvious occurs in the mining below the water table, either in underground workings or open pits. This provides a direct conduit to aquifers. Groundwater quality is also affected when waters (natural or process waters or wastewater) infiltrate through surface materials (including overlying waste or other material) into ground water.

Risks to human health and the environment from contaminated groundwater usage vary with the types and distance to local users. In addition, impacts on groundwater can also

indirectly affect surface water quality (through recharge and / or seepage). Whereas Impacts on surface water include the build-up of sediments or other toxic products, short and long-term reductions in pH levels (particularly for lakes and reservoirs), destruction or degradation of aquatic habitat, and contamination of drinking water supplies and other human health issues. M/s.Murali Enterprises to construct on a garland drains all along the mine pit.

4.3.1. Mitigation Measures

During the operational phase of mine no waste water or effluent will be generated. Mining in the area well above the ground water table, therefore impact on water regime is not anticipated. The following mitigation measures are suggested for water management and water pollution control.

- It is suggested to adopt proper treatment methods likes Chlorination / Ozonization/ UV radiation to make water fit for drinking.
- Domestic sewage will be diverted to the septic tank followed by soak pit
- The settled dust particles within the storm water collection pond will be removed from the pond periodically.
- Stored storm water can be used for dust suppression & greenbelt development which will reduce / eliminate the usage of fresh water from pumping of ground water.
- The acid mine water, if any, can be collected and stored inside mining area then it has to be pumped out to a storage pond for treatment.
- No chance for acid mine water.
- Further, in the mine closure phase of the mine, a large area is proposed to be used as surface run-off storage structure.
- The stored rain water will be used for maintenance of eco-restoration carried out in the mine lease area.
- Regular monitoring and analyzing the quality of water shall be done once in a year as per standards.

4.4. LAND ENVIRONMENT

Land Use (LU) refers to man's activities and various uses, which are carried on land. Land Cover (LC) refers to natural vegetation, water bodies, rock / soil, artificial cover and others resulting due to land transformation the satellite imageries are potentially more amenable to digital processing because the remote sensor output can be obtained in digital format. Land use data are needed in the analysis of environmental processes and problems that must be understood if living conditions and standards are to be improved from or maintained at current levels.

It is required to carry out the land use / land cover study for the project study area (10 km radius) to obtain the necessary environmental clearances from statutory authorities. The objective of the study is to carryout land use / land cover study for the proposed project. The LU / LC study is carried out using the Satellite Imageries (Resourcesat-2: LISS-III) in addition to Survey of India Toposheets. Appropriate guidelines are followed while preparing the LU / LC map for the project study area.

Area statistics of land use classes has been generated within 10 Km radius of mine lease area (Core zone and Buffer zone).

4.4.1. CONTROL OF GROUND VIBRATION

The following measures are implemented to control the ground vibration at the mine.

- Blasting is done using sequential blasting machine.
- Avoided excessive explosive
- Blast holes are initiate by short delay detonators
- Care is taken to ensure that the effective burden is not excessive and the free face to kept effective long.
- Blasting to maximum number of holes towards the free face.

4.5. AFFORESTATION

It is proposed to plant regional trees @ 50 trees per annum as per land use and Afforestation Plan. Plant details are given in Table No.1.9.

Table No: 9 Afforestation plan

Year	Place	Type of Trees	Number	Rate of survival
2018-19	Lease Boundary & Dump	Neem, Panai, Teak and other regional trees	50	80%
2019-20	Lease Boundary & Dump	Neem, Panai, Teak and other regional trees	50	80%
2020-21	Lease Boundary & Dump	Neem, Panai, Teak and other regional trees	50	80%
2021-22	Lease Boundary & Dump	Neem, Panai, Teak and other regional trees	50	80%
2022-23	Lease Boundary & Dump	Neem, Panai, Teak and other regional trees	50	80%

4.6. SOCIO ECONOMIC ENVIRONMENT

The mining lease area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc., exist within the lease area or in the vicinity. It is the non mining operation will not disturb/ relocate any village or need resettlement. Thus no adverse impact is anticipated.

The proposed of the mine with enhanced capacity provided employment to 34 persons which will aid in the overall social economic development of the region.

4.7. OCCUPATIONAL HEALTH AND SAFETY

There is no endemic barbless in the area due to waste water/ air/ soil borne disease however stray cases of water borne diseases such as gastroenteritis and fever have been observed. Occupational health surveillance of all the mines employees is being done regularly and records of the same are being maintained as per mines. Act. The pre-employment and initial and periodical medical tests of all employees are conducted as per schedule initially and after every six month. Camp of well-equipped lab and medical staff from outside agency is being organized at out site periodically.

Personal Protective Equipment is provided to all mines employees, free of cost.

- Safety shoe, safety helmet, reflecting jacket
- Nose mask
- Safety Belt
- Ear muffs
- Welder Equipment for Eye and face protection
- Hand gloves.

Excessive dust and noise are the chief health hazards for the mine workers. The health of the workers is regularly checked and suitable medical facilities are created on or close to the site. Highest safety is ensured in the working conditions of the miners.

5.0 ANALYSIS OF ALTERNATIVES (TECHNOLGY SITE)

The mine will continue to be operated by open- cast mechanized method using drilling and blasting. No other alternative technologies can be used because of the hard nature of the limestone.

No alternative sites are selected as the project is site specific and limestone deposit is found within the mine area.

6.0 ENVIRONMENTAL MONITORING PROGRAMME

M/s.Murali Enterprises ensure the implementation of the measures within the mine area and carryout efficient monitoring.

M/s.Murali Enterprises continue to monitoring the environmental parameters as per TNPCB/IBM/MoEF& CC guideline.

7.0 BUDGET FOR IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PLAN

M/s.Murali will incur an amount of Rs. 67.78 lakhs (towards capital expenditure) and Rs.6 lakhs for Environmental monitoring cost per annum for implementation of environmental management plan for this expansion project.

8.0 PROJECT BENEFITS

M/s.Murali Enterprises to contributing to the economic development of the region through generating primary, secondary and tertiary employment and business opportunities to the local people which in turn help in improving the quality of life of the local community and society at large.

8.1 Glimpse of CSR Activities undertaken:

1. Eradicating hunger, poverty and malnutrition, promoting preventing health care and making available safe drinking water;
2. Promoting education, including special education and employment enhancing vocation skills especially among children, women, elderly and the differently abled and livelihood enhancement projects;
3. Promoting gender equality, empowering women, setting up homes and hostels for women and orphans; setting up of old age homes, day care centres and such other facilities for senior citizens and measures for reducing inequalities faced by socially and economically backward groups;
4. Ensuring environmental sustainability ecological balance. Protection of flora and fauna animal welfare, agro forestry, conservation of natural resources and maintaining quality of soil, air and water;
5. Protection of national heritage, art and culture including restoration of buildings and sites of historical importance and works of art; setting up public libraries; promotion and development of traditional arts and handicrafts;
6. Measures for the benefit or armed forces veterans, war widow and their dependents;
7. Training to promote rural sports; nationally recognized sports, Paralympic sports and Olympic sports;

8. Contribution to the Prime Minister's National Relief fund or any other fund set up by the Central Government for socio-economic development and relief and welfare of the Scheduled Castes, the Scheduled tribes, other backward classes, minorities and women;
9. Contributions or funds provided to technology incubators located within academic institutions which are approved by the Central Government;
10. Rural Development Projects;

9.0 CONCLUSION

Based on the EIA study it is observed that there will be a marginal increase in the dust pollution, which will be controlled with the effective implementation of the environment management measures as suggested in the EIA/EMP report and as may recommended by SEIAA, State Pollution Control Board, the negative impacts will be minimized to a great extent. There will be negligible impact on ambient environment & ecology due to mining activities, moreover the mining operations will lead to direct and indirect employment generation in the area.

The mining activity in the region will have positive impact on the social economic condition of the area by way of providing employment to the local in-habitants; wages paid to them will increase the per capita income, housing, education, medical and transportation facilities, economic status, health and agriculture by improving the life style of the people. A major part of the labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and mining activities. Indirect employment opportunities to local people in contractual works like construction of infrastructural facilities, transportation of Limestone to destinations, sanitation, supply of goods and services to the mine and other community services. The State Government will also benefit directly from the existing limestone mine, through increased revenue from royalties, excise duty and etc...

Also the proponent's Corporate Social Responsibility initiatives will have a positive impact on socio economic environment of the region.