

EXECUTIVE SUMMARY

Tvl.Sri Venkatramana Swamy Blue Metals, ROUGH STONE AND GRAVEL QUARRY

S.F. Nos: 195/1 (P) & 198/1 (P) - Extent: 4.90.0 ha
Thennilai (East) Village, Pugalur Taluk, Karur District,
Tamil Nadu State

**“B1” CATEGORY – MINOR MINERAL – CLUSTER – NON FOREST
LAND**

*** CLUSTER EXTENT =11.08.0 HA**

Complied as per ToR Obtained vide

Lr.No.SEIAA-TN/F.No.7702/SEAC/TOR-773/2020 Dated: 06.10.2020

Project Proponent

Tvl.Sri Venkatramana Swamy Blue Metals,

Thiru.M. Sivanandam, Managing Partner,
No-128, Old Bypass Road,
Karur District- 639001, Tamil Nadu State

Environmental Consultant



GEO EXPLORATION AND MINING SOLUTIONS

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* Calculated as per MoEF & CC Notification – S.O. 2269(E) Dated: 01.07.2016

1. INTRODUCTION

Rough Stone and Gravel are the major requirements for construction industry. This EIA report is prepared for M/s. Sri Venkataramana Swamy Blue Metals applied for Rough stone and Gravel quarry lease in S.F.Nos 195/1(P) & 198/1(P) over an extent of 4.90.0 Ha in Thennilai (East) Village, Pugalur Taluk, Karur District.

Environment Impact Assessment taken by including Cumulative load of Existing and proposed quarries within the radius of 500m from the proposed project site. Two Existing Quarries and one proposed Quarry (This project) falls in the cluster area, total extent of Cluster is 11.08.0 ha. Cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

This EIA Report is prepared in compliance with ToR obtained vide letter No Lr.No.SEIAA-TN.F.No.7702/SEAC/TOR-773/2020 Dated 06.10.2020 for Tvl. Sri Venkataramana Swamy Blue Metals and the Baseline Monitoring study has been carried out during the period of October – December 2020.

Now, as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018 clarified the requirement for EIA, EMP and therefore, Public Consultation for all areas from 5 to 25 ha falling in Category B- 1 and appraised by SEAC/ SEIAA as well as for cluster situation.

The proposed projects is categorized under category “B1” Activity 1(a) (mining lease area in cluster situation) and will be considered at SEIAA – TN after conducting Public Hearing and Submission of EIA/EMP Report for Grant of Environmental Clearance.

“Draft EIA report prepared on the basis of ToR Issued for carrying out public hearing for the grant of Environmental Clearance from SEIAA, Tamil Nadu”

1.1 DETAILS OF PROJECT PROPONENT –

Name of the Project Proponent	:	Thiru. M.Sivanandam Managing Partner Tvl. Sri Venkataramana Swamy Blue Metals
Address	:	No. 128, Old Bypass Road, Karur District,
District	:	Karur
State	:	Tamil Nadu
Pin code	:	639 001
Mobile No	:	+ 91 99949 80902

The applicant is a partnership Firm. Thiru.M.Sivanandam is the Managing Partner of this Firm.

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

Sl.No.	Name of Quarry	SF.No.	Extent	Details
P-1	Tvl.Sri Vengatramana Swamy Blue Metals, RoughStone and Gravel Quarry	195/1(P) & 198/1(P) Thennilai,(East)) Village	4.90.0 ha	This project
E-1	Tvl.Sri Vengatramana Swamy Blue Metals, RoughStone and Gravel Quarry	191/3 Part & 192 Thennilai (East) Village	4.90.0 ha	20.01.2016 to 19.01.2021
E-2	Tmt.Santhimathi, RoughStone and Gravel Quarry	193/3B Thennilai,(East) Village	1.28.0 ha	12.08.2016 to 11.08.2021
TOTAL CLUSTER EXTENT			11.08.0 ha	

TABLE 1.3 SALIENT FEATURES OF THE PROPOSAL – P1

SALIENT FEATURES OF PROPOSAL “P1”		
Name of the Mine	Rough stone and Gravel quarry belongs to Tvl.Sri Venkataramana Blue Metals.	
Survey Nos	195/1(P) & 198/(P)	
Land Type	Patta land vide Patta.No: 958 & 2410	
Extent	4.90.0Ha	
Mining Plan Period	5years	
Ultimate Pit Dimension	237m (L) x 180m(W) x 40m(5m above ground level + 35m below ground level)	
Latitude between	10°59'10.01"N to 10°59'21.02"N	
Longitude between	77°51'57.12"E to 77°52'05.21"E	
Elevation	167m AMSL	
Water level	53m – 58m AMSL	
Machinery Proposed	Jack Hammer	8
	Compressor	2
	Excavator with Bucket and rock Breaker	2
	Taurus	6
Proposed Blasting Method	Usage of Slurry Explosive with MSD detonators	
Manpower Proposed	40	
Total Project Cost	Rs. 1,08,62,000/-	

1.4 STATUTORY DETAILS

The project proponent had applied for Rough Stone and Gravel quarry lease over an extent of 4.90.0 ha of Patta Land in SF.No 195/1(P) & 198/1(P), Thennilai (East) village, Pugalur Taluk, Karur District. Tamil Nadu State – Dated: 04.09.2019

- The application was processed and has been recommended for quarrying lease with precise area communication vides Rc.No.535/Kanimam/2019,Dated: 29.11.2019 (Enclosed with Mining plan) issued by the District Collector, Coimbatore for preparation of Mining Plan and Obtaining Prior Environmental Clearance from SEIAA, TN.
- Mining plan got approved by the Director of Geology and Mining,Karurvide Rc.No.535Kanimam/2019, dated 27.02.2020
- The proposed project falls under “B1” Category as per Order Dated: 04.09.2018 & 13.09.2018 passed by Hon'ble National Green Tribunal, New Delhi in O.A. No. 173 of 2018 & O.A. No, 186 of 2016 and MoEF & CC Office Memorandum F. No. L-11011/175/2018-IA-II (M) Dated: 12.12.2018.
- Therefore, the project proponent submitted their online application for ToR for EC on 12.06.2020 vide online proposal number – SIA/TN/MIN/53847/2020,Dated 12.06.2020.

The proposal was placed in 169th SEAC Meeting held on 07.08.2020 & 161st SEAC Meeting held on 07.08.2020 and considered in 399th SEIAA Meeting Dated: 24.09.2020 for grant ToR and issued Terms of Reference (ToR) for preparation of EIA/EMP vide Letter No. SEIAA-TN/F.No.7702/SEAC/ToR-773/2020 Dated: 06.10.2020.

2. PROJECT DESCRIPTION

The proponent applied for Rough Stone and Gravel Quarry Lease vide application dated 04.09.2019 over 4.90.0 ha area. The precise area communication letter issued by the District Collector Dated 29.11.2019, the mining plan has been prepared and got approved by Deputy Director, Karur District Dated: 27.02.2020.

The area is rocky barren land, no major vegetation or trees within the project area, the project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarry.

Rough Stone and Gravel is proposed to be excavated by opencast mechanized method involving splitting of rock mass of considerable volume from the parent rock mass by jackhammer drilling and blasting, hydraulic excavators are used for loading the Rough Stone from pithead to the needy crushers and rock breakers to avoid secondary blasting.

1.2 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	Village road 250m Southeast (NH 67) Trichy – Coimbatore- 2.7Km –Northeast (SH 84) – Erode – Karur-8.0Km- Eastern side.
Nearest Village	Vengalapatti – 1.5Km – SW
Nearest Town	Karur – 20.0 km - North
Nearest Railway Station & Railway Line	Karur – 24.0 km - East Karur – Erode line 10.0 km - North
Nearest Airport	Trichy Airport - 90.0Km - west
Seaport	Thoothukudi 250 km South

2.2 LAND USE PATTERN OF THE LEASE APPLIED AREA

DESCRIPTION	Area to be required during the present plan period (ha)	Area at the end of life of quarry (ha)
Area under quarry	Nil	3.60.3
Infrastructure	Nil	0.01.0
Roads	Nil	0.04.0
Green Belt	Nil	1.23.1
Stocking blocks	4.90.0	0.01.3
Grand Total	4.90.0	4.90.0

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

Description	Rough stone in m³	Gravel in m³
Geological Resources	17,90,282	98,318
Mineable Reserves	8,62,582	72,176
Year-wise Production	8,62,582	72,176
Number of Working Days	300 Days	
Production per day	575	80
No of Lorry loads (6m ³ per load)	96	13
Proposed depth for mining plan period	38m	2m
Total Depth	40m	

FIGURE – 1: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA

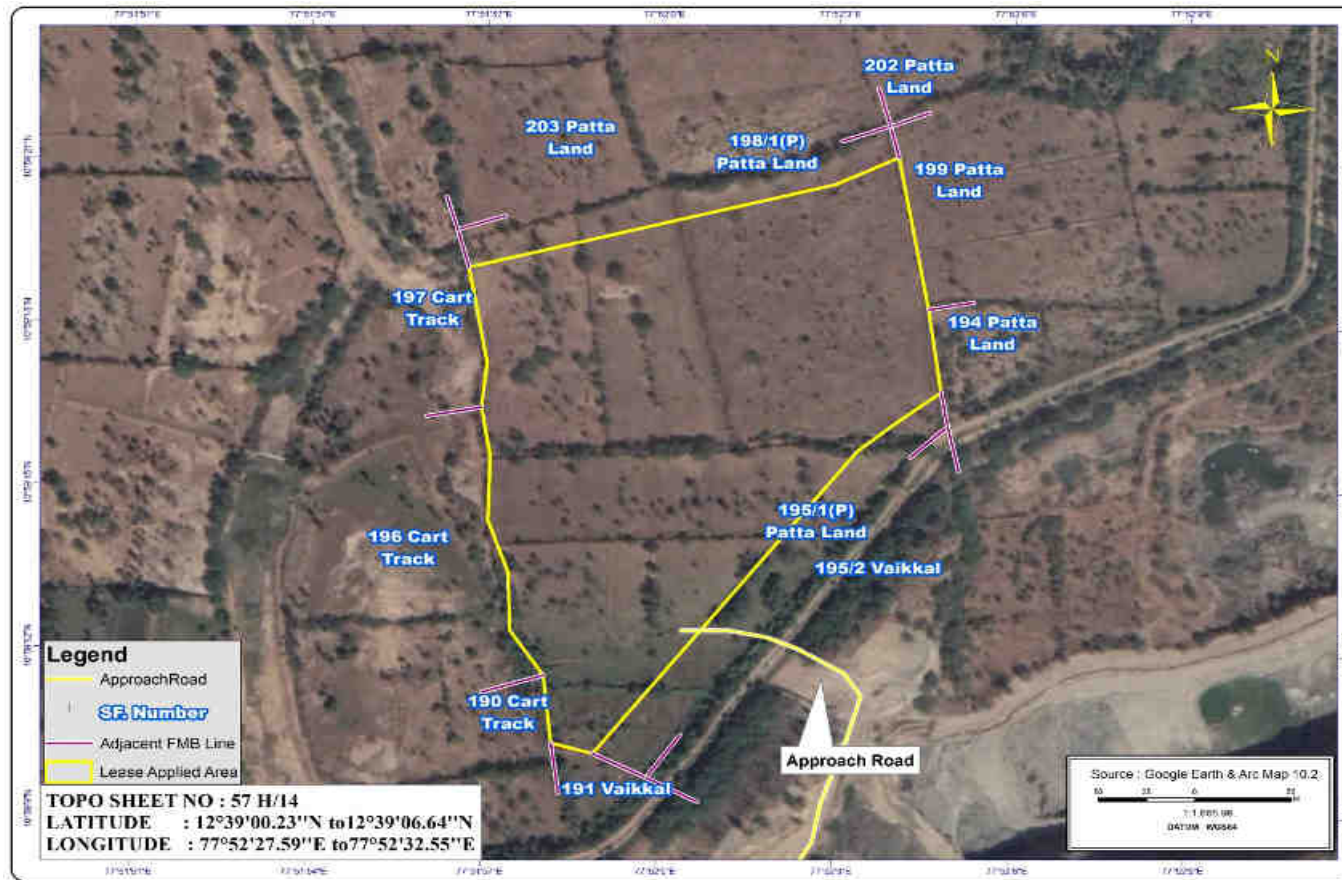


FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)

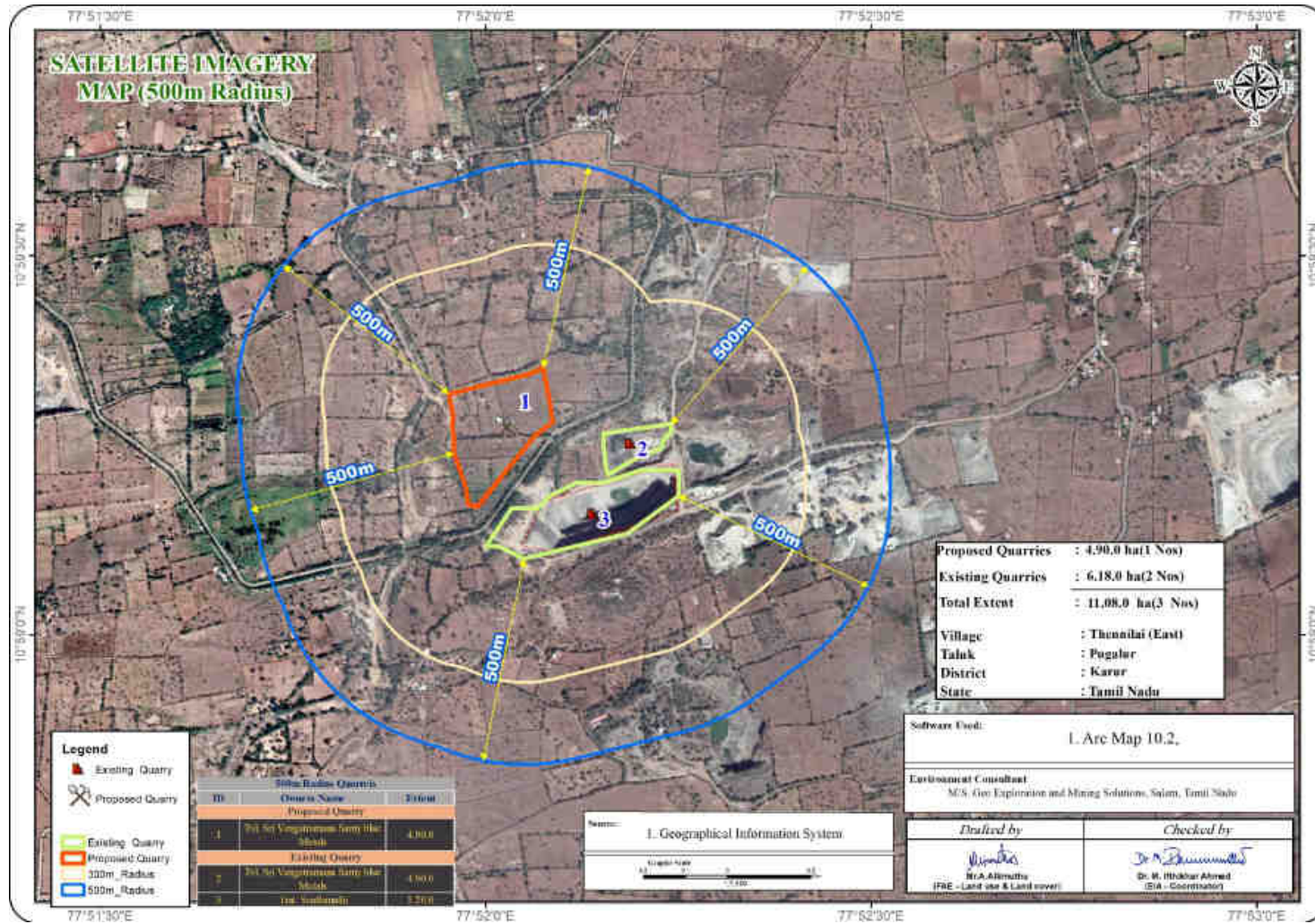


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS

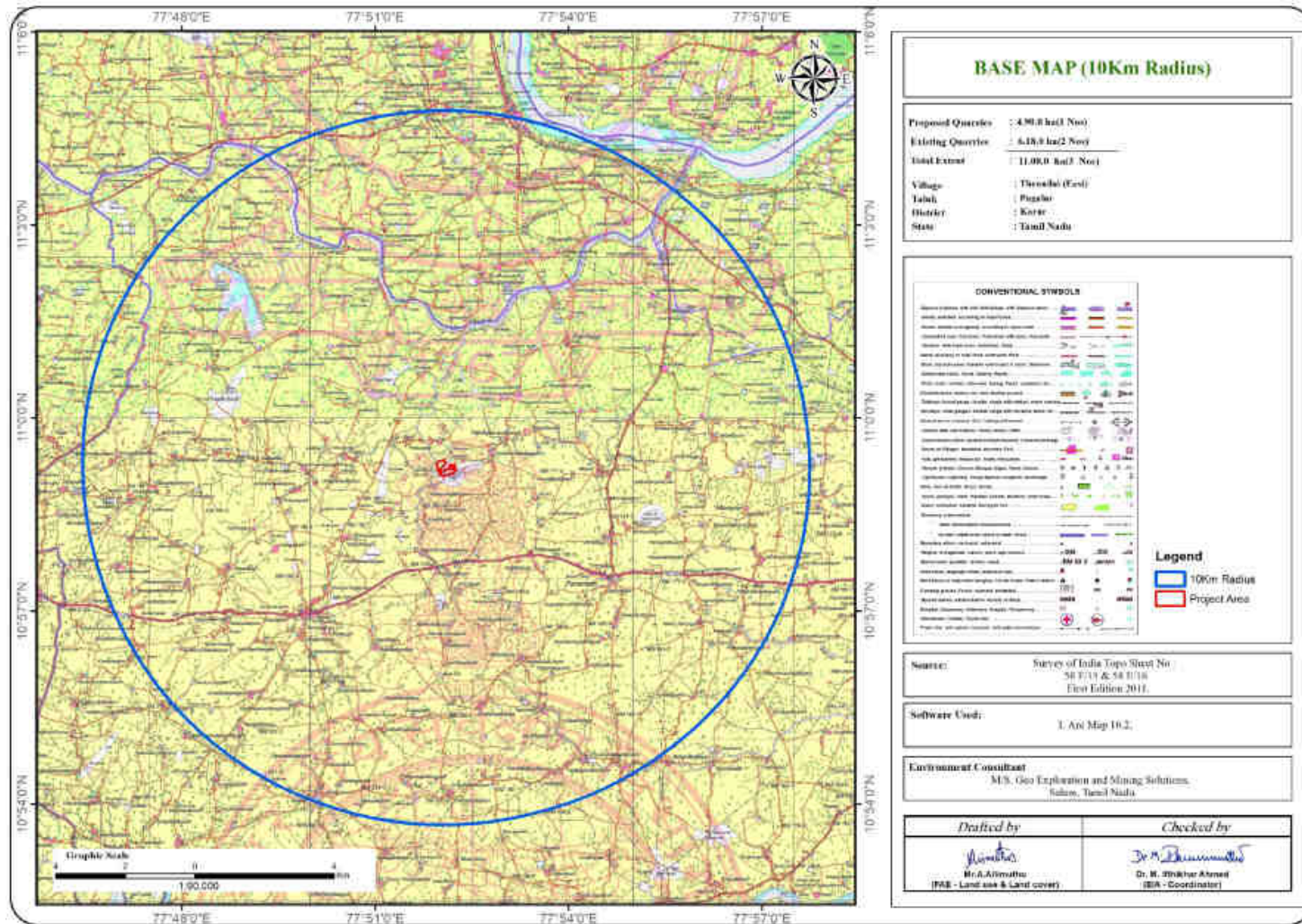


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN

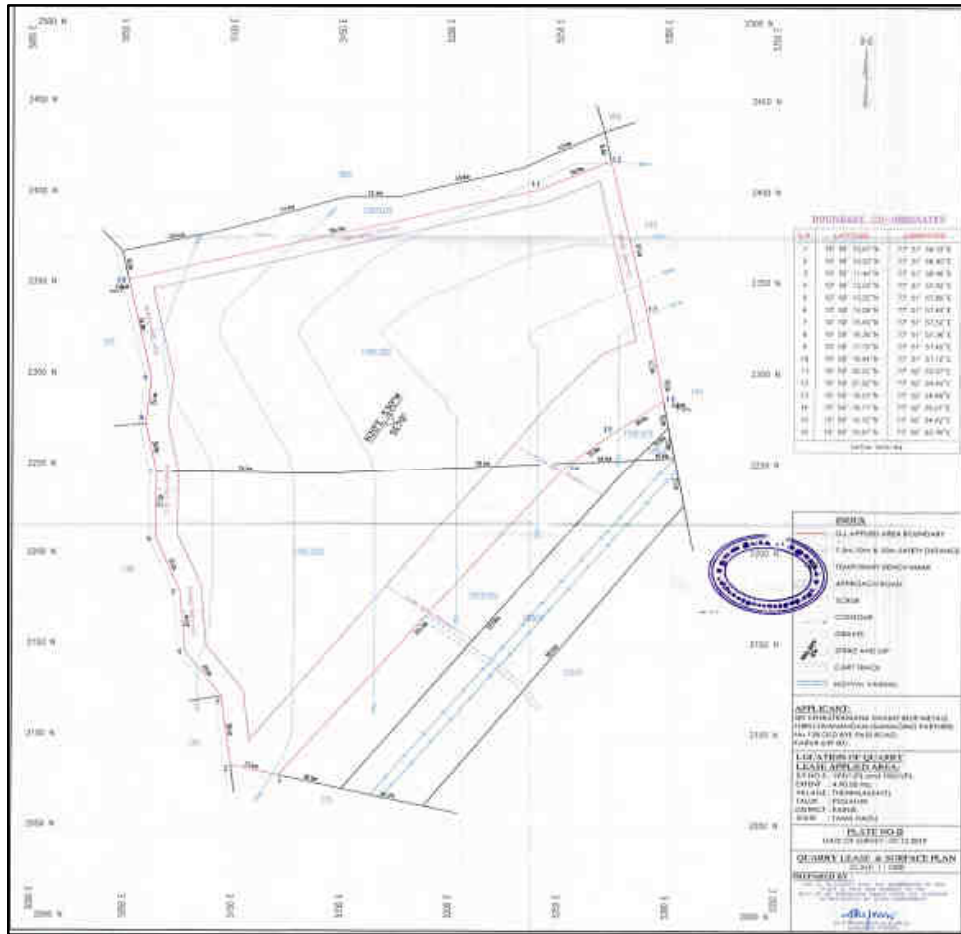


FIGURE – 5: PHOTOGRAPHS OF THE PROJECT AREA



2.4 METHOD OF MINING

Opencast Mechanized Mining Method is proposed by formation bench height is 5m and 5m width with 90° slope. However, as far as the quarrying of Rough Stone is concerned, observance of the provisions of Regulation 106 (2) (b) as above is seldom possible due to various inherent petro genetic factors coupled with mining difficulties. Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Director of Mines Safety for which necessary provision is available with the Regulation 106 (2) (b) of MMR-1961, under Mine Act – 1952.

The top layer of Gravel will be directly excavated by Hydraulic Excavators and loaded into tippers directly and sold to needy customers. The Rough Stone is a batholith formation and the splitting of rock mass of considerable volume from the parent rock mass will be carried out by deploying jackhammer drilling and Slurry Explosives will be used for blasting. Hydraulic Excavators attached with Rock Breakers unit will be deployed for breaking large boulders to required fragmented sizes to avoid secondary blasting and hydraulic excavators attached with bucket unit will be deployed for loading the Rough Stone into the tippers and then the stone is transported from pithead to the nearby crushers

2.5 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammer	8	1.2 to 6m	Compressed air
2	Compressor	2	140cfm/400psi	Diesel Drive
3	Excavator with Bucket & Rock Breaker	1	300	Diesel Drive
4	Tipper	6	20	Diesel Drive

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

Conceptual mining plan is prepared with an object of long-term systematic development of benches; lay outs, selection of permanent ultimate pit limit, depth of quarrying and ultimate pit, selection of sites for construction of infrastructure etc. The ultimate pit size is designed based on certain practical parameters such as economical depth of quarrying, safety zones, permissible area etc.

2.7 ULTIMATE PIT DIMENSION

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
I	237	180	40m(5m above ground level + 35m below ground level)

3.0 DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out covering October 2020, November 2020 & December 2020 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by OMEGAA LABORATORIES ISO 9001: 2008, OHSAS 18001: 2007 Certified & MoEF Notified Laboratory

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Sl.No.	Attributes	Parameters	Source and Frequency
1	Ambient Air Quality	PM10, PM 2.5, SO2, NO2	Continuous 24 hourly samples twice a week for three months at 7 locations (2Core & 5 Buffer)
2	Meteorology	Wind speed and direction, temperature, relative humidity and rainfall	Near project site continuous for three months with hourly recording and from secondary sources of IMD station
3	Water quality	Physical, Chemical and Bacteriological parameters	Grab samples were collected at 4 ground water and 2 surface water locations once during study period.
4	Ecology	Existing terrestrial and aquatic flora and fauna within 10 km radius circle.	Limited primary survey and secondary data was
5	Noise levels	Noise levels in dB(A)	locations (3Core & 4 Buffer) – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations (1 Core & 5 Buffer) during study period
7	Land use	Existing land use for different categories	Based on Survey of India topographical sheet and satellite imagery and primary survey.
8	Socio-Economic Aspects	Socio-economic and demographic characteristics, worker characteristics	Based on primary survey and secondary sources data like census of India 2011.
9	Hydrology	Drainage pattern of the area, nature of streams, aquifer characteristics, recharge and discharge areas	Based on data collected from secondary sources as well as hydro-geology study report prepared.
10	Risk assessment and Disaster Management Plan	Identify areas where disaster can occur by fires and explosions and release of toxic substances	Based on the findings of Risk analysis done for the risk associated with mining.

3.2 LAND ENVIRONMENT

Land use pattern of the area was studied through LISS III imagery of Bhuvan (ISRO). The 10 km radius map of study area was taken for analysis of Land use cover. The main objective of this section is to provide a baseline status of the study area covering 10 km radius around the mine site so that temporal changes due to the mining activities on the surroundings can be assessed in future.

The majority of the land in the study area is Fallow and Crop land 84.36%.

The total mining area within the study area is 1.75 ha i.e., 0.84 %. The cluster area of 11.08.0 ha contributes about 1.91 % of the total mining area within the study area. This percentage of Mining Activities shall not have any significant impact on the environment.

The project area is situated a elevated terrain and the topography of the area is undulated terrain with gradient towards Southeast and the altitude of the area is ranges from 167m AMSL There is no Wildlife Sanctuaries, National Park and Archaeological monuments within project area. Therefore, there will be no need to acquisition/diversion of forest land.

3.3 SOIL ENVIRONMENT

- ✚ Variation in pH of the soil in the study area was found to be moderately alkaline to strongly alkaline in nature (7.65.-8.36).
- ✚ Mostly the soils collected from different location in the study area are Clay loam & bulk density of the soil in range between 1.02 to 1.22 g/cc.
- ✚ The available Nitrogen content range between 147.5 to 211.2 kg/ha
- ✚ The available Phosphorus content range between 1.05 to 1.75 kg/ha
- ✚ The available Potassium range between 26.1 to 40.2 mg/kg

3.4 WATER ENVIRONMENT

Major water bodies in the study area is Noyyal River is located 4.0Km North-East & Aathupalayam Reservoir is located 6.0 Km- North-west from the proposed project area The study area is studded with few tanks that serve as the source of drinking water and also their surplus feeds adjoining tanks. The rainfall over the area is moderate, the rainwater storage in open wells and trenches are in practice over the area and the stored water acts as source of freshwater for couple of months after rainy season.

Surface water

Ph:

The pH varied from 7.29 to 7.59 while turbidity found within the standards (Optimal pH range for sustainable aquatic life is 6.5 to 8.5 pH).

Total Dissolved Solids:

Total Dissolved Solids varied from 456 to 498mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

Chloride varied between 151.0 mg/l and 166.5 mg/l. Nitrates varied from 4.5 to 5.5 mg/l, while sulphates varied from 26.6 to 31.5mg/l.

Ground water:

The pH of the water samples collected ranged from 7.05 to 7.92 and within the acceptable limit of 6.5 to 8.5ph. Sulphates and chlorides of water samples from all the source are within the limits as per the standard. On Turbidity, the water samples meet the

requirement. The Total Dissolved Solids were found in range of 352 to 435 mg/l in all samples. The Total hardness varied between 123.5 to 148.68 mg/l for all samples.

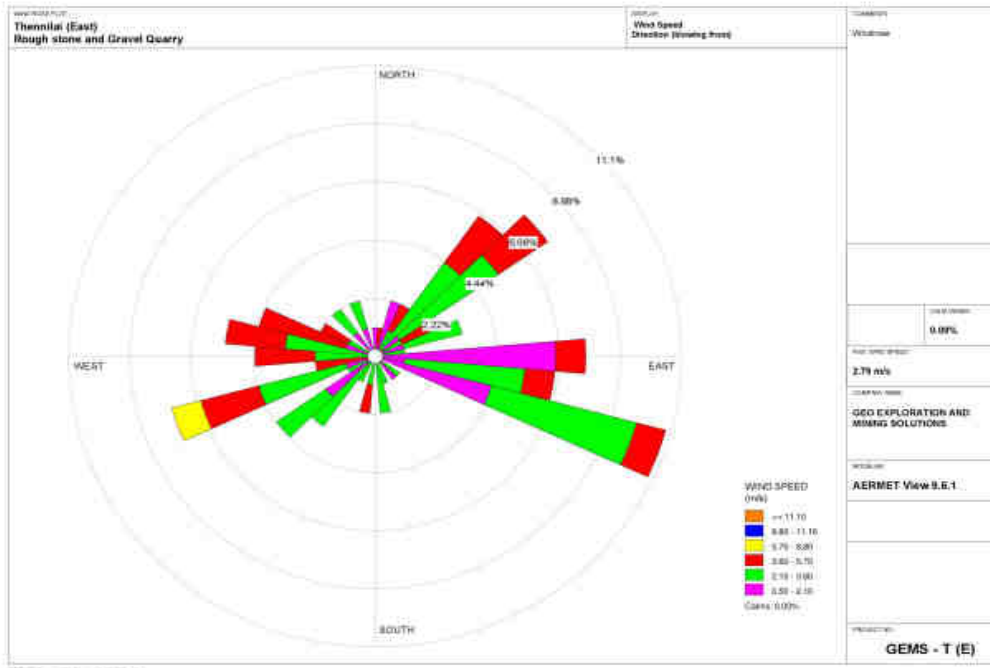
On Microbiological parameters, the water samples from all the locations meet the requirement. The parameters thus analysed were compared with IS 10500:2012 and are well within the prescribed limits.

3.5 AIR ENVIRONMENT

The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information.

Wind rose diagram of the study site is depicted in Figure.6. Predominant downwind direction of the area during study season is North - East to South West.

FIGURE – 6: WIND ROSE DIAGRAM



3.6 SUMMARY OF AMBIENT AIR QUALITY

As per monitoring data, PM₁₀ ranges from 34 µg/m³ to 43.2 µg/m³, PM_{2.5} data ranges from 17.1 µg/m³ to 23.7 µg/m³, SO₂ ranges from 4.0 µg/m³ to 6.9 µg/m³ and NO₂ data ranges from 14.5 µg/m³ to 20.7 µg/m³.

The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.7 NOISE ENVIRONMENT

Ambient noise levels were measured at 7 (Seven) locations around the proposed project area. Noise levels recorded in core zone during day time were from 48.2 – 48.5 dB (A) Leq and during night time were from 37.3 – 37.8dB (A) Leq. Noise levels recorded in buffer zone during day time were from 48.1 – 50.2 dB (A) Leq and during night time were from 42.9 – 44.7 dB (A) Leq.

The values of noise observed in some of the areas are primarily owing to quarrying activities due to cluster of quarries within 500m radius, movement of vehicles and other anthropogenic activities. Noise monitoring results reveal that the maximum & minimum noise levels at day time were recorded in the range of 38.5 dB(A) in core zone and 55.3 dB(A) in Semmandampalayam village and 34.2 dB(A) in Munnur Village & 42.7 dB(A) in Kattampatti village at night time. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.8 ECOLOGICAL ENVIRONMENT

There is no Forest land, National Parks, Eco sensitive areas, Wild life sanctuaries within the radius of 10 km. An ecological survey of the study area was conducted particularly with reference to the listing of species and assessment of the existing baseline ecological (terrestrial) condition in the study area.

There is no schedule I species of animals observed within study area as per Wildlife Protection Act 1972 as well as no species is in vulnerable, endangered or threatened category as per IUCN. There is no endangered red list species found in the study area. Hence this small operation over short period of time will not have any significant impact on the surrounding flora and fauna.

3.9 SOCIO ECONOMIC ENVIRONMENT

It includes demographic structure of the area, provision of basic amenities viz., housing, education, health and medical services, occupation, water supply, sanitation, communication, transportation, prevailing diseases pattern as well as feature like temples, historical monuments etc., at the baseline level. This will help in visualizing and predicting the possible impact depending upon the nature and magnitude of the project.

The socio economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of

population is suffering from lack of permanent job to run their day to day life. Their expectation is to earn some income for their sustainability on a long-term basis.

The proposed project will aim to provide preferential 40 persons to the local people there by improving the indirect employment opportunity in the area were around 70 persons in turn the social standards will improve.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

In order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components. This would help in formulating suitable management plans sustainable resource extraction.

4.1 LAND ENVIRONMENT:

ANTICIPATED IMPACT

The main anticipated impact on the Land Environment due to quarrying operation is change in Landscape, change in Land – use Pattern. The total area applied for quarry lease is 4.90.0 Ha, the total extent of the cluster is 11.08.0 Ha including existing and proposed quarries. The proposed project area is proponent own patta land, No forest land involved in this lease applied area. The ultimate depth of the proposed project is quarrying is varies from 40 (5m above ground level + 35m below ground level) and will not intersect the ground water table. The project is site specific.

MITIGATION MEASURES

Due to the quarrying activities in the project the land use pattern will be altered. In order to minimize the adverse effects, the following control measures will be implemented:

- In the Rough stone and Gravel quarrying operation the degradation of land is insignificant, after completion of the quarrying operation the land will be allowed to collect rain water which will act as temporary reservoir, this rough stone does not produce any toxic effluents in the form of solid, liquid or gas
- The periphery of the mining lease area will be converted to a greenbelt to prevent Noise and sound propagation to the nearby lands
- Construction of garland drains all around the quarry pit and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area

Barbed wire fencing will be carried out at the conceptual stage; Security will be posted round the clock, to prevent inherent entry of the public and cattle.

4.2 WATER ENVIRONMENT

ANTICIPATED IMPACT ON SURFACE AND GROUND WATER

The impact due to quarrying on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during quarrying process. The proposed depth of this project is 40m and water table is found at a depth of 53 - 58m BGL the quarrying activity will not intersect ground water table.

The quarrying operation will be carried out well above the water table. There is no intersection of surface water bodies (Streams, Canal, Odai etc.) in the project area. During rainy season rain water will be collected in the quarry pit and later used for greenbelt development and for the water sprinkling in the haul roads. There is no proposal for discharging of quarry pit water outside the project area

There is no proposal Rough stone processing or workshop within the project area thus there is no effluent anticipated in the mine.

MITIGATION MEASURES

The following mitigation measures are suggested for water management

- Rainwater will be collected in lower part of the quarry pit by construction of garland drains to divert surface run-off and will be connected to setting tank of 5 m (l) x 5m (w) x 3m (d) to allow suspended solids to settle down if any. This collected water will act as a rain water harvesting system and will be used for dust suppression and greenbelt development
- Six month once analysis of quarry pit water and ground water quality in nearby villages will be carried out to ensure the water quality is not affected due to the quarrying activities
- Domestic sewage from site office & urinals/latrines provided in project area will be discharged through septic tank followed by soak pit system
- Only clear and settled water free from silt content will be used for dust suppression and plantation purposes
- De-silting will be carried out before and immediately after the monsoon season and the settling tank and drains will be cleaned weekly, especially during monsoons
- Tippers & HEMM will be washed in a designated area and the washed water will be routed through drains to a settling tank, which has an oil & grease trap, only clear water will be reused for greenbelt development.

4.3 AIR ENVIRONMENT

The air borne particulate matter is the main air pollutant in this opencast mining. The mining operation will be carried out by jackhammer drilling (35mm dia) and Hydraulic Excavators will be utilized for excavation of Rough Stone and Gravel.

ANTICIPATED IMPACT

Wind erosion of the exposed areas and the air borne particulate matter generated by quarrying operation, and transportation are mainly PM₁₀ & PM_{2.5} and emissions of Sulphur dioxide

(SO₂) & Oxides of Nitrogen (NO_x) due to excavation/loading equipment and vehicles plying on haul roads are the cause of air pollution in the project area.

Similarly, loading - unloading and transportation of Rough Stone and Gravel, wind erosion of the exposed area and movement of light vehicles will be a cause of pollution due to quarrying activities within a radius of 500 meters from the project area. This leads to a cumulative impact on the ambient air environment around the project area.

Anticipated incremental concentration due to this quarrying activity and net increase in emissions due to quarrying activities within 500 meters around the project area is predicted by Open Pit Source modelling using AERMOD Software.

MITIGATION MEASURES

Drilling – To control dust at source, wet drilling will be practiced. Where there is a scarcity of water, suitably designed dust extractor will be provided for dry drilling along with dust hood at the mouth of the drill-hole collar.

Advantages of Wet Drilling:-

- In this system dust gets suppressed close to its formation. Dust suppression become very effective and the work environment will be improved from the point of occupational comfort and health.
- Due to dust free atmosphere, the life of engine, compressor etc., will be increased.
- The life of drill bit will be increased.
- The rate of penetration of drill will be increased.
- Due to the dust free atmosphere visibility will be improved resulting in safer working conditions.

Blasting –

- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Avoid blasting i.e., when temperature inversion is likely to occur and strong wind blows towards residential areas
- Controlled blasting include Adoption of suitable explosive charge and short delay detonators, adequate stemming of holes at collar zone and restricting blasting to a particular time of the day i.e. at the time lunch hours, controlled charge per hole as well as charge per round of hole
- Before loading of material water will be sprayed on blasted material
- Dust mask will be provided to the workers and their use will be strictly monitored

Haul Road & Transportation –

- Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation
- Transportation of material will be carried out during day time and material will be covered with tarpaulin

- The speed of tippers plying on the haul road will be limited below 20 km/hr to avoid generation of dust.
- Water sprinkling on haul roads & loading points will be carried out twice a day
- Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore weekly maintenance of machines improves combustion process & makes reduction in the pollution.
- The un-metalled haul roads will be compacted weekly before being put into use.
- Over loading of tippers will be avoided to prevent spillage.
- It will be ensured that all transportation vehicles carry a valid PUC certificate
- Grading of haul roads and service roads to clear accumulation of loose materials

Green Belt –

- Planting of trees all along main mine haul roads and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of dumpers/trucks
- Green belt of adequate width will be developed around the project areas

Occupational Health –

- Dust mask will be provided to the workers and their use will be strictly monitored
- Annual medical check-ups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers & tipper drivers
- Ambient Air Quality Monitoring will be conducted six month once to assess effectiveness of mitigation measures proposed.

4.4 NOISE ENVIRONMENT

ANTICIPATED IMPACT

Noise pollution poses a major health risk to the mine workers. Following are the sources of noise in the existing open cast mine project are being observed such as Drilling, & Blasting, Loading and during movement of vehicles.

MITIGATION MEASURES

- Usage of sharp drill bits while drilling which will help in reducing noise;
- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;

- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.
- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.

4.5 BIOLOGICAL ENVIRONMENT

ANTICIPATED IMPACT

- ✚ None of the plants will be cut during operational phase of the mine.
- ✚ There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.
- ✚ Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.

Wild life is not commonly found in the cluster area and its immediate environs because of lack of vegetal cover and surface water. Except few domestic animals, reptiles, hares and some common birds are observed in the study area.

MITIGATION MEASURES

- I. Native plant species will be planted in consultation with DFO.
- II. Trees growing up to 5m or more in height with large canopy cover & leaf area will be planted around the installation.
- III. Fast growing trees with thick perennial foliage will be grown, as it takes many years for trees to grow to their full height.
- IV. In order to facilitate the proper growth of vegetation, limited measures involving preparation of seedbed with suitable amount of fertilizers and treatment with mulches will be taken.
- V. The topsoil will be used for green belt development / plantation.

Vegetation covers in and around the mine workings generally helps in:

- ✓ Control of dust.
- ✓ Reducing noise.
- ✓ Stabilizing erodible slopes to minimize pollution.
- ✓ Ground water re-charging
- ✓ Enhancement of aesthetic value.

For re-vegetation, the plants and saplings suitable for the existing soils and site conditions will be considered. It is recommended to plant fast growing local species, which can adapt to the local climate.

GREENBELT DEVELOPMENT PLAN

<i>Year</i>	<i>No. of trees proposed to be</i>	<i>Survial %</i>	<i>Area to be covered</i>	<i>Name of the species</i>	<i>No. of trees expected to be</i>
I	275	80%	2462	Neem,	220
II	275	80%	2462	Pongamia	220
III	275	80%	2462	Pinnata,	220
IV	275	80%	2462	Mango	220
V	275	80%	2462	Casuarina	220

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 43 persons and indirectly will get employment around 70 persons.

MITIGATION MEASURES

- Good maintenance practices will be adopted for plant machinery and equipment, which will help to avert potential noise problems.
- Green belt will be developed in and around the project site as per Central Pollution Control Board (CPCB) guidelines.
- Appropriate air pollution control measure will be taken to minimize the environmental impact within the core zone.
- For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- Benefit to the State and the Central governments through financial revenues by way of royalty, tax, DMF, NMET etc, from this project directly and indirectly.

3. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The site has been selected based on geological investigation and exploration as below:

- Occurrence of minerals at the specific site.
- Transportation facility for materials & manpower.
- Overall impact on environment and mitigation feasibility
- Socio – economic background.

The mineral deposits are site specific in nature; hence question of seeking alternate site does not arise for this project.

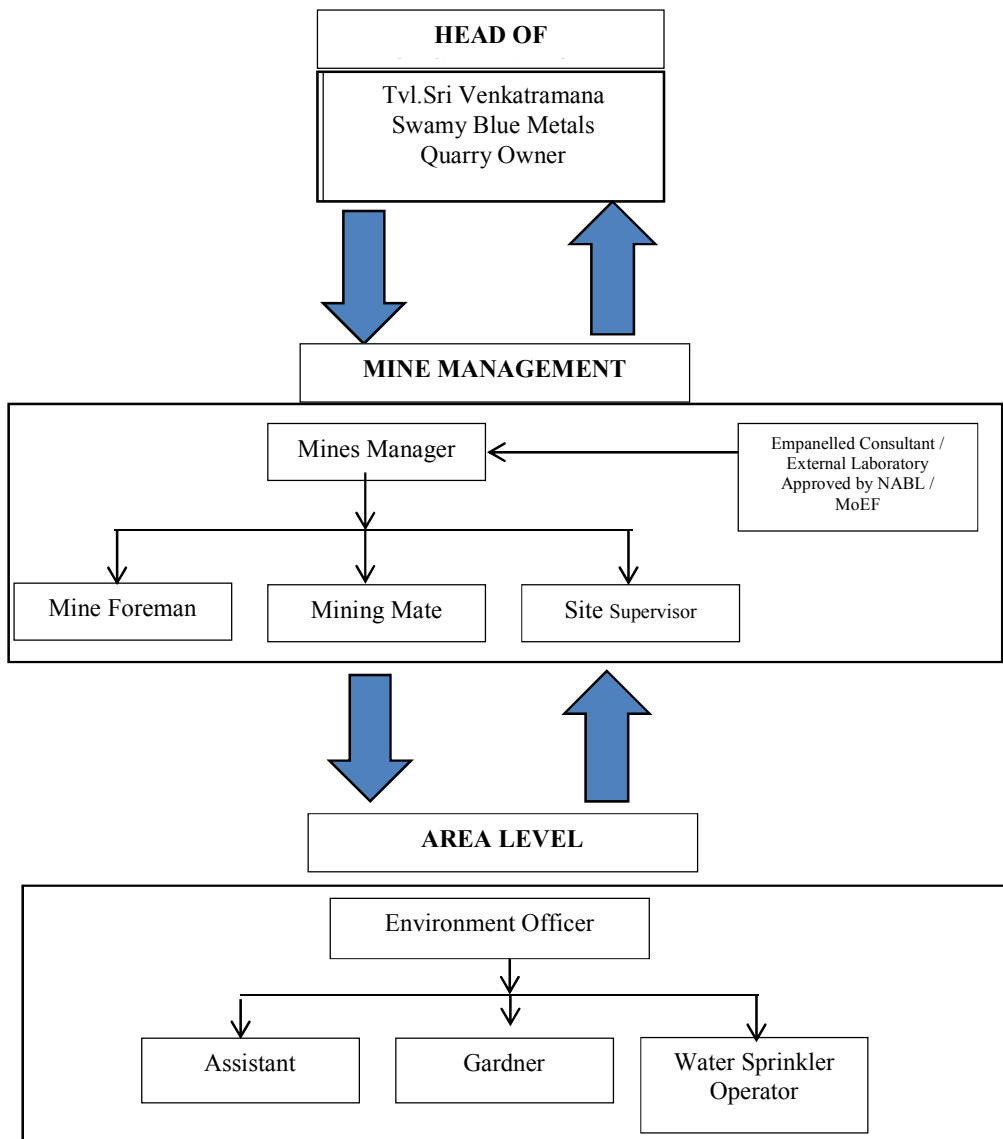
4. ENVIRONMENT MONITORING PROGRAM

Usually an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by natural or human activities. Hence regular monitoring program of Environmental parameters is essential to take into account the changes in the Environment.

The Objective of Monitoring -

- ✚ To check or assess the efficiency of the controlling measures;
- ✚ To establish a data base for future impact assessment studies

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	8 Locations (2 Core & 6 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM _{2.5} , PM ₁₀ , SO ₂ and NO _x .
2	Meteorology	At mine site before start of Air Quality Monitoring & IMD Secondary Data	Hourly / Daily	Continuous online monitoring	Wind speed, Wind direction, Temperature, Relative humidity and Rainfall
3	Water Quality Monitoring	7 Locations (3 SW & 4 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone around 1 km at specific wells	-	Once in 6 months	Depth in bgl
5	Noise	8 Locations (3 Core & 5 Buffer)	Hourly – 1 Day	Once in 6 months	Leq, Lmax, Lmin, Leq Day & Leq Night
6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting Operation	Peak Particle Velocity
7	Soil	6 Locations (1 Core & 5 Buffer)	–	Once in six months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

7. ADDITIONAL STUDIES

7.1 RISK ASSESSMENT

The methodology for the risk assessment has been based on the specific risk assessment guidance issued by the Directorate General of Mine Safety (DGMS), Dhanbad, vide Circular No.13 of 2002, dated 31st December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine

granted by the DGMS, Dhanbad. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

7.2 DISASTER MANAGEMENT PLAN

The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

- ✚ Rescue and medical treatment of casualties;
- ✚ Safeguard other people;
- ✚ Minimize damage to property and the environment;
- ✚ Initially contain and ultimately bring the incident under control;
- ✚ Secure the safe rehabilitation of affected area; and
- ✚ Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency

7.3 CUMULATIVE IMPACT STUDY

CUMULATIVE PRODUCTION LOAD OF ROUGH STONE

Quarry	Mineable Reserves In m ³	Proposed production for five-year period	Production Per day in m ³	Number of Lorry loads per Week
P1	8,62,582	8,62,582	575	96
E1	2,82,775	2,82,775	188	31
E2	55,686	55,686	37	6
Total	12,01,043	12,01,043	800	133

CUMULATIVE PRODUCTION LOAD OF GRAVEL

Quarry	Mineable Reserves In m ³	Proposed production for five-year period	Production Per day in m ³	Number of Lorry loads per Week
P1	72,176	72,176	80	13
E1	1,400	1,400	5	1
E2	-	-	-	-
Total	73,576	73,576	85	14

PREDICTED NOISE INCREMENTAL VALUES IN 500 M RADIUS QUARRIES

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	43.3	49.0	50.0	55
Habitation Near E1	40.8	49.0	49.6	
Habitation Near E2	42.1	46.1	47.6	

GROUND VIBRATIONS

NEAREST HABITATION FROM EACH MINE

Location ID	Distance
Habitation P1	360m
Habitation E1	430m
Habitation E2	600m

SOCIO ECONOMIC BENEFITS FROM 3 MINES

Location code	Employment	Project Cost	CER @ 2%
P1	40	1,04,82,000	2,09,640
E1	11	63,26,000	1,26,520
E2	18	26,00,000	52,000
Total	69	19,408,000	3,88,160

The 3 quarries shall create employment to 69 peoples and revenue will be created to government

PROJECT BENEFITS

In Thennilai (East) Rough Stone and Gravel Cluster – Proposed Quarries aims to produce about – 8,62,582m³ Rough Stone & 72,176m³ of Gravel over a period of 5 Years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

- ✚ Increase in Employment Potential
- ✚ Improvement in Socio-Economic Welfare
- ✚ Improvement in Physical Infrastructure
- ✚ Improvement in Social infrastructure

5. ENVIRONMENT MANAGEMENT PLAN

The Environment Monitoring Cell discussed formed by the mine management will ensure effective implementation of environment management plan and to ensure compliance of environmental statutory guidelines through Mine Management Level.

The said team will be responsible for:

- ✚ Monitoring of the water/ waste water quality, air quality and solid waste generated
- ✚ Analysis of the water and air samples collected through external laboratory
- ✚ Implementation and monitoring of the pollution control and protective measures/ devices which shall include financial estimation, ordering, installation of air pollution control equipment, waste water treatment plant, etc.

- ✚ Co-ordination of the environment related activities within the project as well as with outside agencies
- ✚ Collection of health statistics of the workers and population of the surrounding villages
- ✚ Green belt development
- ✚ Monitoring the progress of implementation of the environmental monitoring programme
- ✚ Compliance to statutory provisions, norms of State Pollution Control Board, Ministry of Environment and Forests and the conditions of the environmental clearance as well as the consents to establish and consents to operate.

6. CONCLUSION

It can be concluded from overall assessment of the impacts, in terms of positive and negative effects on various environmental components, that the mining activities will not have any adverse effect on the surrounding environment.

To mitigate any impacts due to the mining activities, a well-planned EMP and a detailed post project monitoring system is provided for regular monitoring and immediate rectification at site. Due to the cluster quarrying activities, socio economic conditions in and around the project site will be improved substantially. Hence, the Prior Environmental Clearance shall be granted at the earliest.