

EXECUTIVE SUMMARY

Thiru.R.Sivaraj

ROUGH STONE QUARRY

S.F. No 8 / 1 – Extent: 2.50.0 ha

Uthupatti Village, Kulithalai Taluk, Karur District,
Tamil Nadu State

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

*** CLUSTER EXTENT = 5.40.5 HA**

Complied as per ToR Obtained vide

Lr.No.SEIAA-TN/F.No.7222/SEAC/TOR-718/2020 Dated: 23.06.2020

Project Proponent

Thiru.R.Sivaraj,

S/o. Ramasamy,

Ponnamapatti Village, Kulithalai Taulk,
Karur District, Tamil Nadu State

Environmental Consultant



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

1. INTRODUCTION

Thiru.R.Sivaraj applied for Roughstone quarry lease over an extent of 2.50.0 ha in S.F. No 8/1, in Uthupatti Village, Kulithalai Taluk, Karur District, Tamil Nadu. Tamil Nadu State as per the Amendment Rules 41 & 42 of Tamil Nadu Minor Mineral Concession Rules, 1959.

There are 1 Existing Quarries within the radius of 500m from the periphery of this Proposed Project Site (Ref: 500 m Radius Letter Issued by Assistant Director (i/c), Department of Geology and Mining vides Letter Rc.No.146/Mines/2019 Dated: 03.02.2020).

Now, as per MoEF & CC Notification S.O. 2269 (E) Dated: 01.07.2016, the cluster area is calculated to an extent of 5.40.5 ha considering this proposed quarry & one existing quarry and the Cumulative Environmental Impact Assessment and Environmental Management Plan is prepared accordingly complying the ToR obtained vide Lr.No.SEIAA-TN/F.No.7222/SEAC/TOR-718/2020 Dated: 23.06.2020.

“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 : R.Sivaraj
 Address : S/o. Ramasamy
 Ponnampatti Village, Kulithalai Taluk,
 Karur
 State : Tamil Nadu
 Mobile No : +91 9442490298
 The project proponent is an individual

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

Sl.No.	Name of Quarry	SF.No.	Extent	Details
P-1	Thiru.R.Sivaraj, Rough stone Quarry	8/1	2.50.0 ha	This Project
E-1	Tmt.G.Vasantha, Rough stone and Gravel Quarry	286/2B2B(P) & 356/2	2.90.5 ha	10/09/2018 to 09/09/2023
TOTAL CLUSTER EXTENT			5.40.5 Ha	

1.3 SALIENT FEATURES OF THE PROPOSAL – P1

SALIENT FEATURES OF PROPOSAL “P1”		
Name of the Mine	Rough stone quarry belongs to Thiru. R. Sivaraj	
Survey Nos	8/1	
Land Type	Government poramboke land	
Extent	2.50.0 Ha	
Mining Plan Period / Lease Period	5 years	
Existing pit dimension	Pit I	78m(L) x 66m (W) x6m (D)
	Pit II	35m(L) x 29m (W) x1m (D)
	Pit III	24m(L) x 17m(W) x 3m (D)
Ultimate Pit Dimension	191m(L) x 126m(W) x 21m(D)	

Proposed Depth of Mining	21m BGL	
Latitude between	10°41.52.72''N To 10°41'57.75''N	
Longitude between	78°27'44.00''E To 78°27'50.92''E	
Toposheet No	58-J/06	
Highest Elevation	135m AMSL	
Water level	45 – 50m BGL	
Machinery Proposed	Jack Hammer	5
	Compressor	1
	Excavator with rock breaker attachment/Bucket	1
	Tippers	2
Proposed Blasting Method	Controlled Blasting Usage of Slurry Explosive with MSD detonators	
Manpower Proposed	22	
Total Cost	Project Cost	Rs 71,70,000/-
	EMP Cost	Rs 3, 80,000/-
	Total	Rs. 75,50,000/-

1.4 STATUTORY DETAILS

- The project proponent had applied for Rough stone quarry lease over an extent of 2.50.0 ha of Patta Land in SF.No 8/1 of , Uthupatti Village, Kulithalai Taluk and Karur District.,Tamil Nadu State – Dated:22.02.2019
- The application was processed and has been recommended for quarrying lease with precise area communication vides Rc. No.146/Mines/2019,Dated:06.03.2019 (Enclosed with Mining plan) issued by the District Collector, Coimbatore for preparation of Mining Plan and Obtaining Prior Environmental Clearance from SEIAA, TN.
- The Mining Plan was prepared and got approved by Joint Director, Geology and Mining,Karur District, vide Letter No: Rc.No:146/Mines/2019, Dated: 27.05.2019.
- 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 09.08.2019 vide online proposal number – SIA/TN/MIN/40939/2019.
- The proposal was placed in 154th SEAC Meeting held on 10.06.2020 & 161st SEAC Meeting held on 10.06.2020 and considered in 382th SEIAA Meeting Dated: 23.06.2020 for grant ToR and issued Terms of Reference (ToR) for preparation of EIA/EMP vide Letter No. SEIAA-TN/F.No.7222/SEAC/TOR-718/2020 Dated: 23.06.2020.

2. PROJECT DESCRIPTION

The proponent applied for Quarry lease dated 25.02.2019. The precise area communication letter issued by District Collector, vide Lr. No. 146/Kanimam/2019, Dated 06.03.2019, the mining plan has been prepared and got approved by the Deputy Director, Rc.No. 146/Mines/2019 Dated 27.05.2019. Previously the quarry lease was

granted to Thogamalai Division Women Self Help Groups Federation vide proceeding of the District collector, Karur in Rc D 226/2000 dated:10.08.2000 (23.09.2000 to 22.09.2005). During this lease period the lessee excavated two pits in the project area the details of the existing pit dimension is

Pit I- 78m(L) x 66m (W) x6m (D),

Pit II-35m(L) x 29m (W) x1m (D),

Pit III-24m(L) x 17m(W) x 3m (D).

Rough Stone 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.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Village/Habitation	Uthupatti Village 1Km- SW (Population=400)
Nearest Town	Manapparai – 10.0 km - SW
Nearest Roadway	(NH 45)- Dindigul-Trichy-5Km- SE (SH 71)- Musiri-Manapparai-5Km-SW
Nearest Railway Station & Line	Samudram Railway Station 6km SE
Nearest Airport	Tiruchirapalli Airport – 28km NE
Seaport	Thoothukudi 235km South

2.2 LAND USE PATTERN OF THE LEASE APPLIED AREA

DESCRIPTION	PRESENT AREA IN (HA)	AREA AT THE END OF LIFE OF QUARRY (HA)
Area under quarry	0.65.7	1.93.0
Infrastructure	Nil	0.01.0
Roads	0.01.0	0.02.0
Green Belt	Nil	0.30.0
Un Utilized area	1.83.0	0.24.0
GRAND TOTAL	2.50.0	2.50.0

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

Particulars	Details	
	Rough stone in m³	Top Soil in m³
Geological Resources	518975	26153
Mineable Reserves	267270	5702
Year wise production for five years	267270	5702

FIGURE – 1: GOOGLE IMAGE SHOWING APPLIED QUARRY LEASE AREA

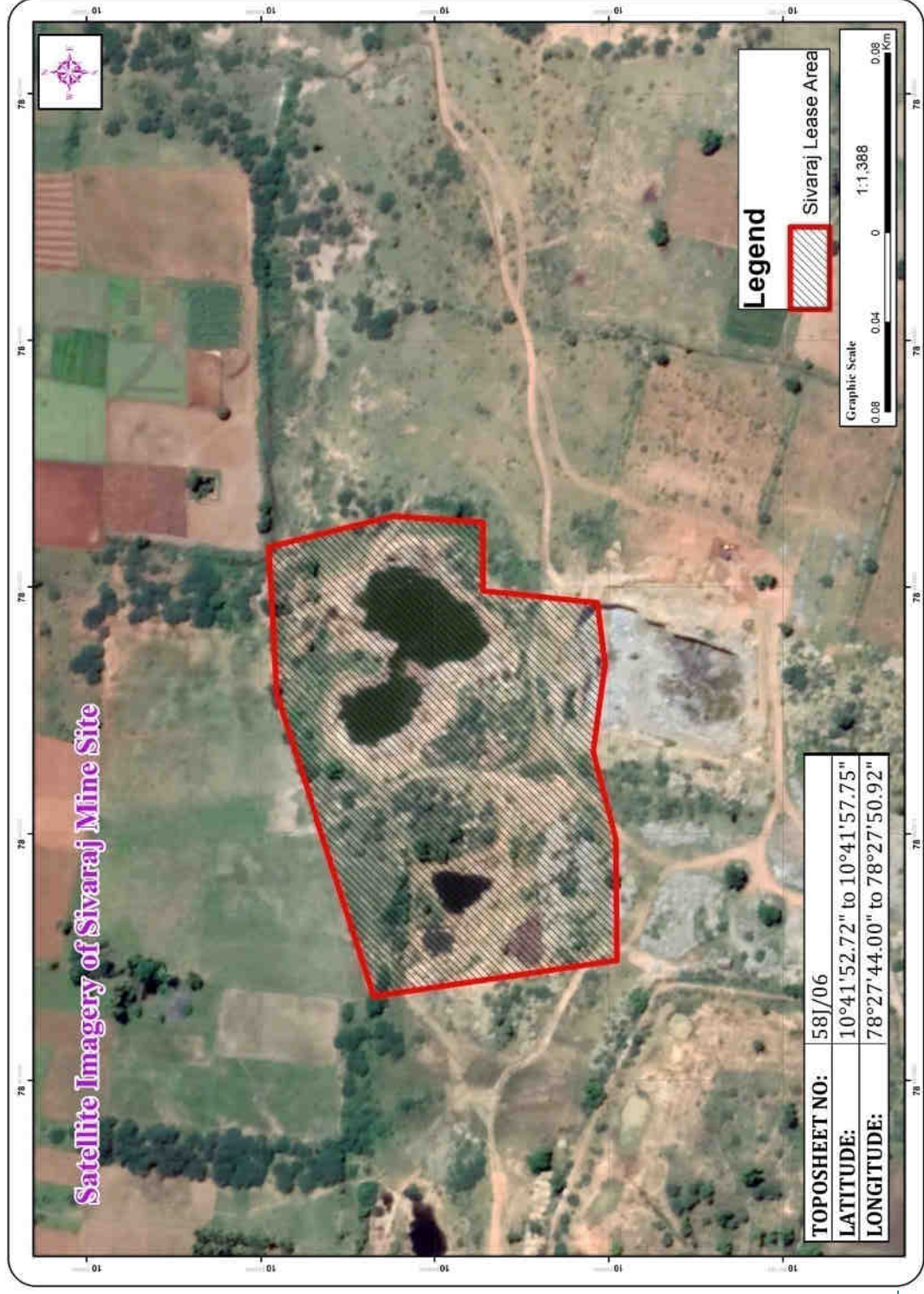


FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER (500 m QUARRIES)

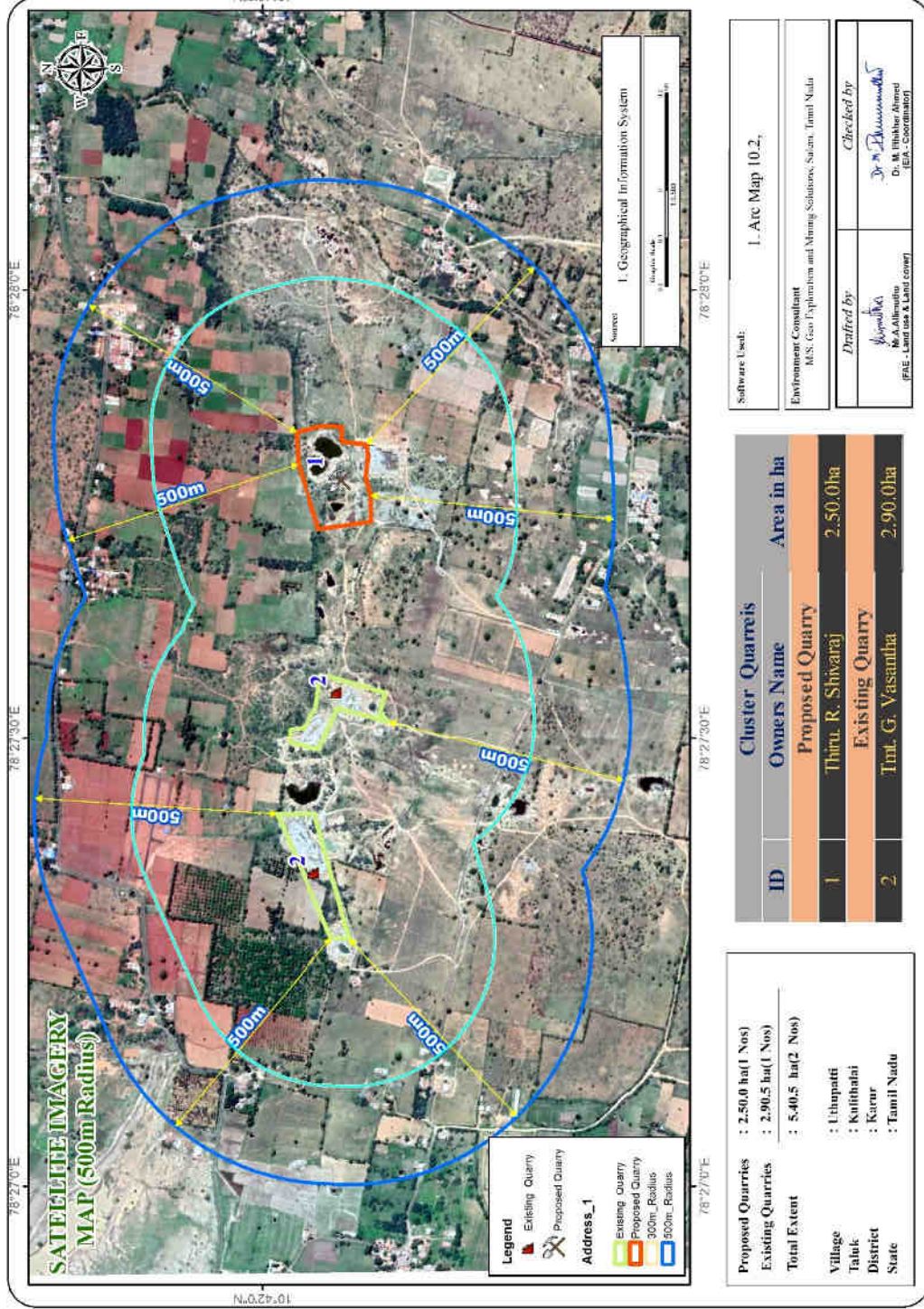


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS

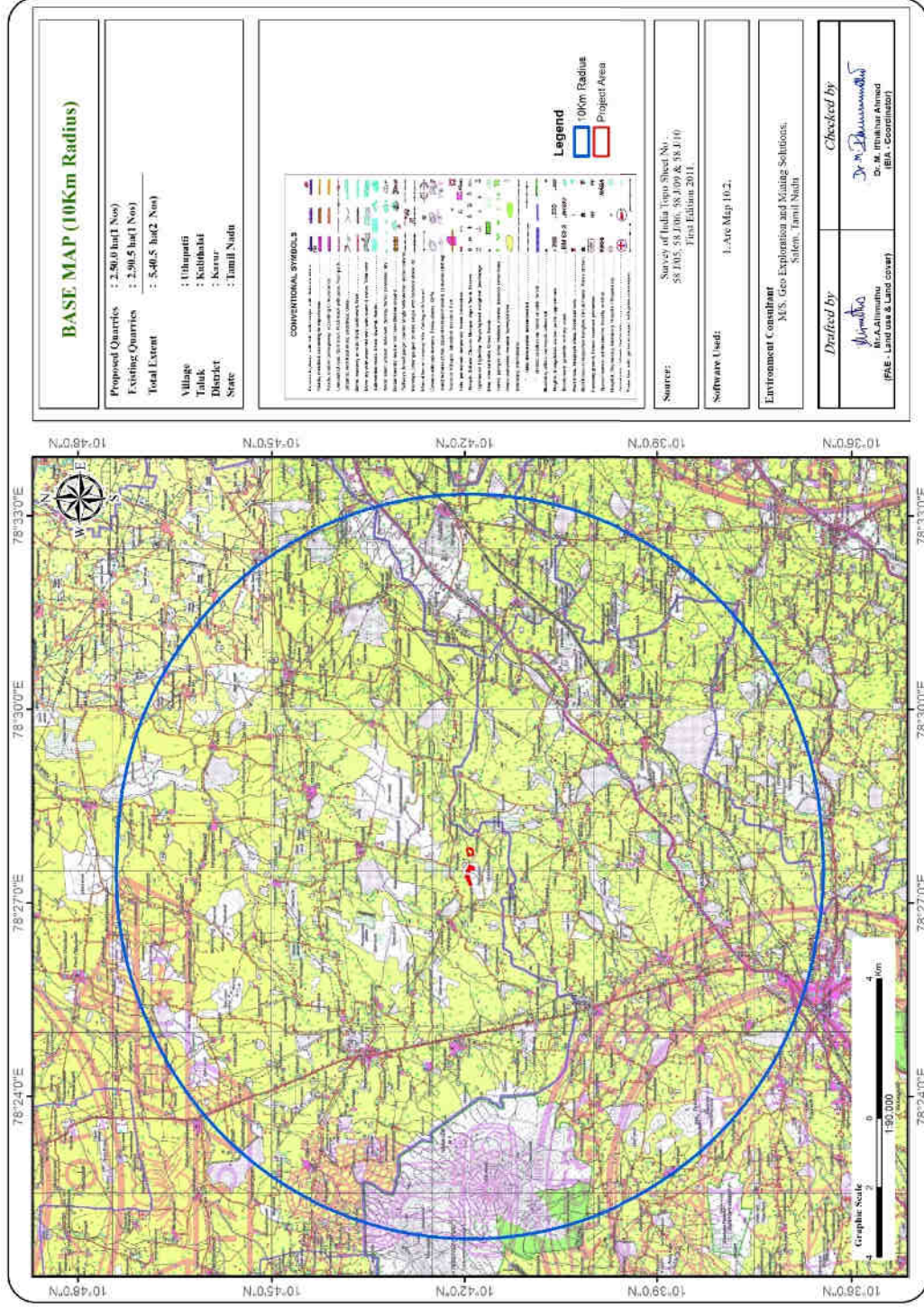


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN

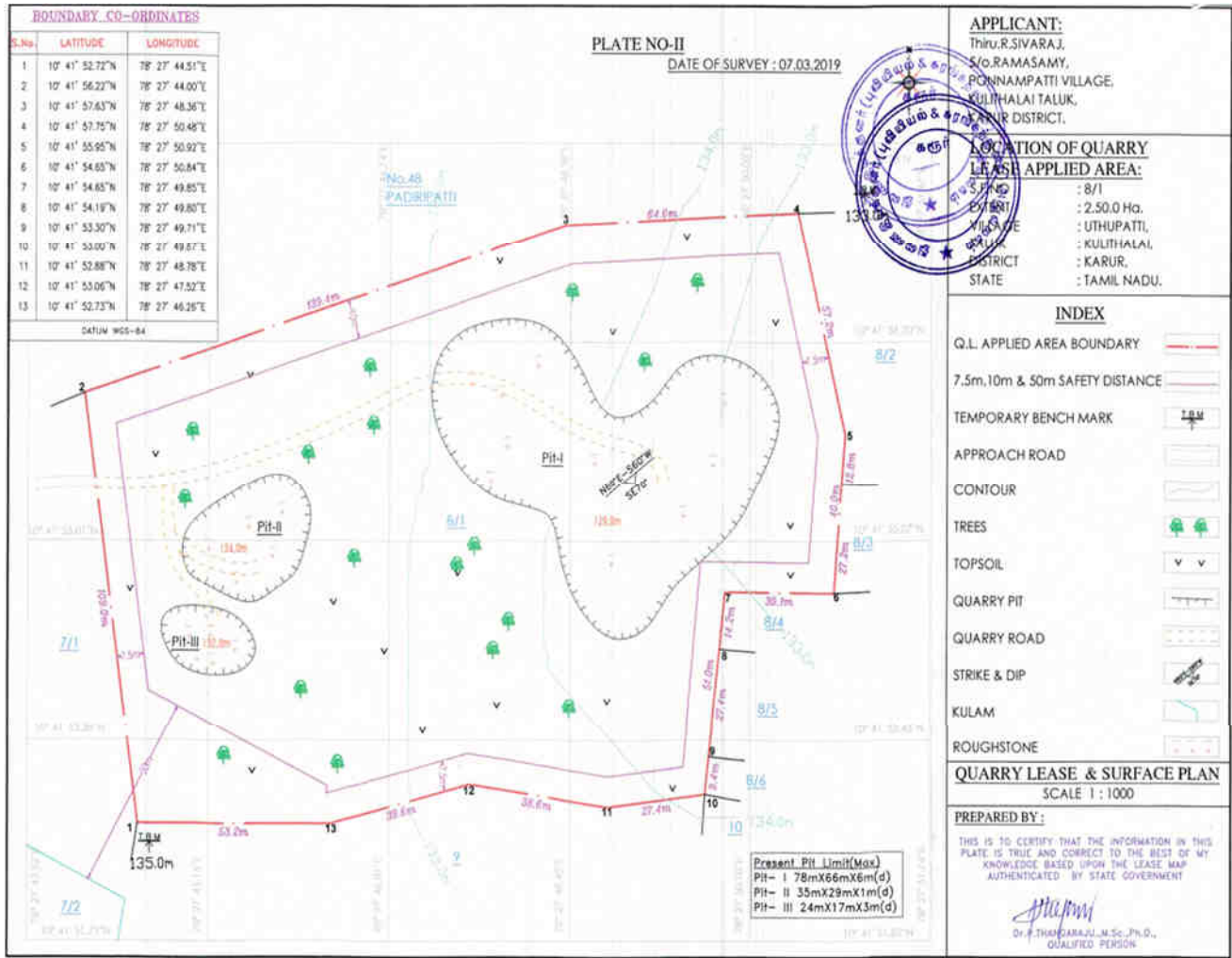


FIGURE – 5: PHOTOGRAPHS OF THE PROJECT AREA



2.4 METHOD OF MINING

The method of mining is Opencast Mechanized Mining Method by formation of 5.0 meter height bench with a bench width not less than the bench height. 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 overburden (Top soil) will be safely removed and preserved in the boundary barrier to facilitate the Greenbelt development.

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	5	1.2m to 2.0m	Compressed air
2	Compressor	1	50 HP	Diesel Drive
3	Excavator with Bucket/ Rock Breaker Unit	1	150-200 HP	Diesel Drive
7	Tippers / Dumpers	2	20 Tonnes	Diesel Drive

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

- ✚ At the end of life of mine, the excavated mine pit / void will act as artificial reservoir for collecting rain water and helps to meet out the demand or crises during drought season.
- ✚ After mine closure the greenbelt developed along the safety barrier and top benches and temporary water reservoir will enhance the ecosystem
- ✚ Mine Closure is a process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
- ✚ The principle closure objectives are for rehabilitated mines to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/ non-contaminating, and capable of sustaining an agreed post-mining land use.

2.7 ULTIMATE PIT DIMENSION

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
I	191	126	21

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 6 locations (2 Core & 4 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)	6 locations – data monitored once for 24 hours during EIA study
6	Soil Characteristics	Physical and Chemical Parameters	Once at 6 locations 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 Agriculture Land (Crop Land + Fallow Land + Agriculture Plantation) followed by Barren Land 9.17%. The total mining area within the study area is 201.40 ha i.e., 0.59.70 %. The cluster area of 5.40.5 ha contributes about 2.68 % 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 exhibits undulated terrain, the gentle sloping towards North East side and the altitude of the area is 135m 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 (8.24-8.64).
- ✚ Mostly the soils collected from different location in the study area are Sandy loam in range between 1.21 to 1.62 g/cc.
- ✚ The bulk density of the soil in the study area ranged between 1.02 – 1.29 g/cc.
- ✚ The available Nitrogen content range between 78 to 194.3 kg/ha
- ✚ The available Phosphorus content range between 1.24 to 1.63 kg/ha
- ✚ The available Potassium range between 29 to 68.4 mg/kg

3.4 WATER ENVIRONMENT

Major water bodies in the study area is Ponnியaru River located 5Km South-East 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

SW1– The analysis results indicate that the pH is 7.02, which is well within the specified standard of 6.5 to 8.5. Total hardness was observed to be 132.1 mg/l. The Total Dissolved Solids (TDS) concentrations varied from 363 to 402 mg/l.

Chloride and fluoride concentrations are found within the limit values. Nitrates varied from 3.7 to 6.4 mg/l. Bacteriological studies reveal that coli form bacteria are not present in the samples. The heavy metal content is below detectable limits.

Ground Water

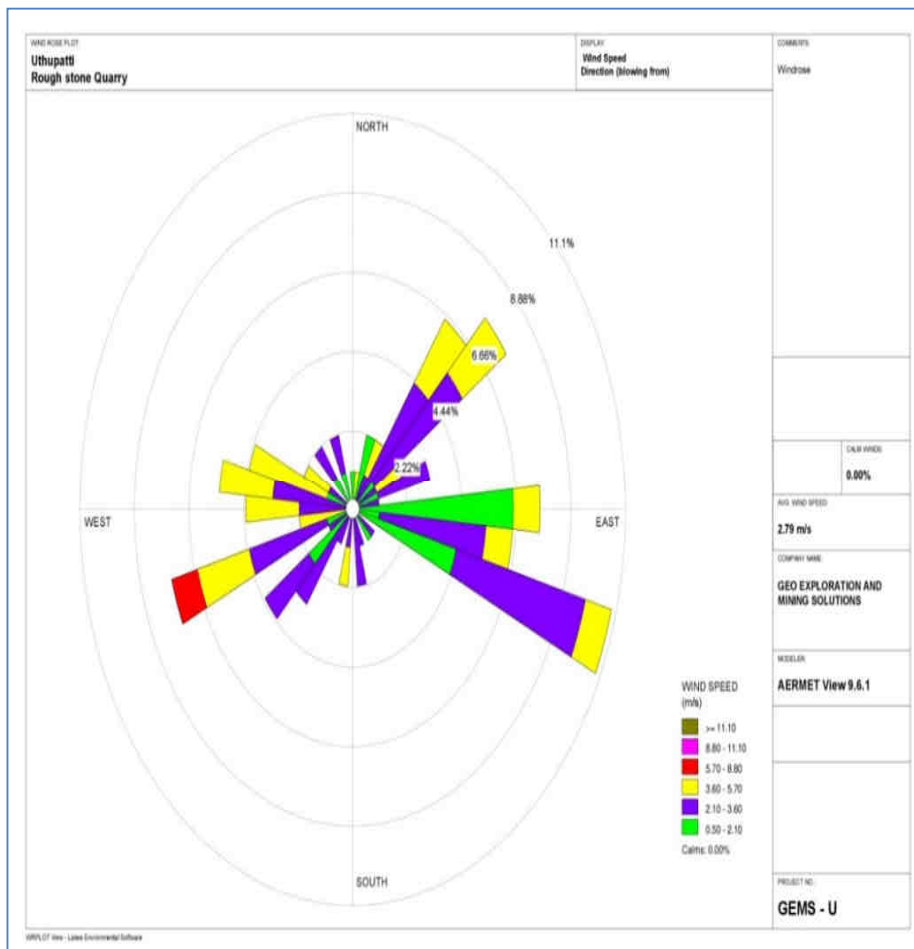
The analysis results indicate that the pH ranges in between 7.85 to 8.13, which is well within the specified standard of 6.5 to 8.5. Total hardness was observed to be ranging from 108 to 194.3 mg/l. The incidence of high total hardness is attributed to the composition of litho units constituting the aquifers in the district. The Total Dissolved Solids (TDS) concentrations were found to be ranging in between 466 to 547 mg/l.

Chlorides at all the locations were within the permissible limit, The Total Dissolved Solids were found in the range of 466 to 547 mg/l in all samples. The Total hardness varied between 108 to 194.3 mg/l for all samples

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.

FIGURE – 6: WIND ROSE DIAGRAM



As per monitoring data, PM₁₀ ranges from 40.64 µg/m³ to 43.70 µg/m³, PM_{2.5} data ranges from 20.60 µg/m³ to 23.40 µg/m³, SO₂ ranges from 5.20 µg/m³ to 7.38 µg/m³ and NO₂ data ranges from 14.30 µg/m³ to 19.58 µg/m³.

The maximum concentration in the core zone is due to the quarrying activity of the cluster of quarries situated within 500m radius. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

3.6 NOISE ENVIRONMENT

Ambient noise levels were measured at 6 (Six) locations around the proposed project area. Noise levels recorded in core zone during day time were from 51.1 – 51.3 dB (A) Leq and during night time were from 40.2 – 41.4 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 47.8 – 53.0 dB (A) Leq and during night time were from 41.5 – 44.6 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 53.0 dB(A) in Padiripatti village and 47.8dB(A) in Pillur village and 44.6 dB(A) in Pillur village & 40.2 dB(A) in Project Area at night time.

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

3.7 ECOLOGICAL ENVIRONMENT

The study involved in the collection of primary data by conducting a survey in the field, examination of floral and faunal records in previously published reports and records. Analysis of the information is the view of the possible alteration in the environment of the project site. For the survey of fauna, both direct and indirect observation methods were used.

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.

3.8 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 employment to the local people there by improving the employment opportunity in the area and in turn the social standards will improve.

3. 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

- Permanent or temporary change on land use and land cover.
- Change in Topography: Topography of the ML area will change at the end of the life of the mine.
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.
- If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course

MITIGATION MEASURES

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development of greenbelt etc.
- Construction of garland drains all around the quarry pits 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
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined out pit will be used for greenbelt
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir

- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimise dust emissions.
- Proper 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

- The major sources of water pollution normally associated due to mining and allied operations are:
 - Generation of waste water from vehicle washing.
 - Washouts from surface exposure or working areas
 - Domestic sewage
 - Disturbance to drainage course in the project area
 - Mine Pit water discharge
- Increase in sediment load during monsoon in downstream of lease area
- This being a mining project, there will be no process effluent. Waste from washing of machinery may result in discharge of Oil & grease, suspended solids.
- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table

MITIGATION MEASURES

- Garland drains, settling tank will be constructed along the individual mining leases. The Garland drains of the individual leases will be connected to settling tank and after settling the water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic analysis of quarry pit water and ground water quality in nearby villages

- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes
- De-silting will be carried out before and immediately after the monsoon season
- Regular monitoring and analysing the quality of water in open well, bore wells and surface water

4.3 AIR ENVIRONMENT

ANTICIPATED IMPACT

- During mining, at various stages activities such as excavation, drilling, blasting, and transportation of materials, particular matter (PM), gases such as Sulphur dioxide, oxides of Nitrogen from vehicular exhaust are the main air pollutants.
- Emissions of noxious gases due to incomplete detonation of explosive may sometimes pollute the air.
- The fugitive dust released from the mining operations may cause effect on the mine workers who are directly exposed to the fugitive dust.
- Simultaneously, the air-borne dust may travel to longer distances and settle in the villages located near the mine lease area.

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

There is no Forest land, National Parks, Eco sensitive areas, Wild life sanctuaries within the radius of 10km.

There are no migratory corridors, migratory avian-fauna, and rare endemic and endangered species. There are no wild animals in the area. No breeding and nesting site were identified in project site. No National park and Wildlife Sanctuary found within 10km radius. The dumps / bunds around the mine itself act as a good barrier for entry of stray animals. In the post mining stage, barbed wire fencing is proposed all around the mined-out void to prevent fall of animals in the mine pits.

MITIGATION MEASURES

To reduce the adverse effects on natural flora/fauna status of the area due to deposition of dust generated from mining operations, water sprinkling and water spraying systems will be ensured in all dust prone areas to arrest dust generation. Methodical and well-planned plantation scheme will be carried out.

GREENBELT DEVELOPMENT PLAN

Year	No of Trees proposed to be planted	Survival %	Area to be covered	Name of the species	No of trees expected to be grown
I	70	80%	600	Neem, Pongamia etc.	56
II	70	80%	600	Neem, Pongamia etc	56
III	70	80%	600	Neem, Pongamiaetc	56
IV	70	80%	600	Neem, Pongamia etc	56
V	70	80%	600	Neem, Pongamia etc	56

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 35 persons and indirectly employment will provide around 60 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.

4. 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.

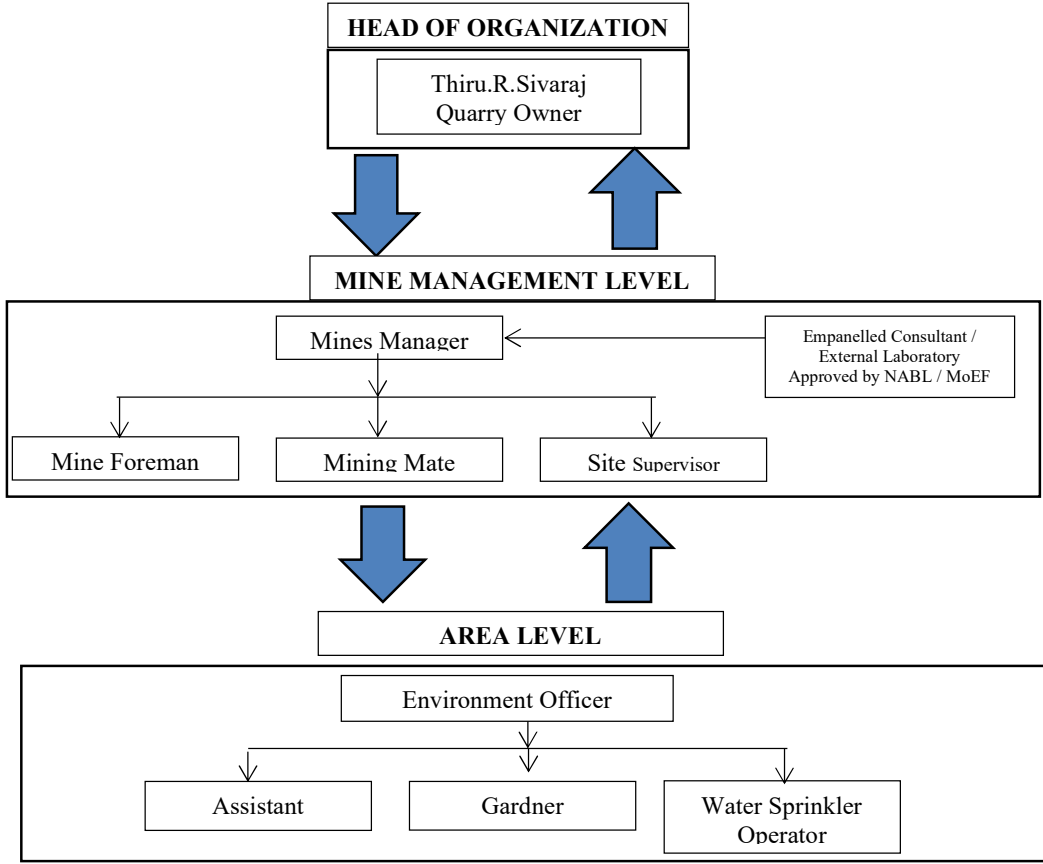
5. ENVIRONMENT MONITORING PROGRAM

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	6 Locations (2 Core & 4 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	6 Locations (2 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	6 Locations (2 Core & 6 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 Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

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 Reserve	PerYear Production	PerDay Production	Number of Lorry Load Per Day
P1	267270 m ³	53454 m ³	178 m ³	30 Trips/day
E1	53571 m ³	10714 m ³	36 m ³	6 Trips/day
Total	320841 m ³	64168 m ³	214 m ³	36 Trips/day

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	42.1	50.6	51.1	55
Habitation Near E1	42.4	44.8	46.8	

SOCIO ECONOMIC BENEFITS FROM 2 MINES

Location code	Employment	Project Cost	CER @ 2%
P1	22	Rs 75,50,000/-	Rs 1,51,000/-
E1	13	Rs 28,99,058/-	Rs 57,981/-
Total	35	Rs 1,04,49,058/-	Rs 2,08,981/-

PROJECT BENEFITS

The Proposed Quarry aims to produce about 2,67,270m³ Rough Stone 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
- ✚ To meet out the demand supply gap of Rough stone

6. 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.

7. 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.