

EXECUTIVE SUMMARY

THIRU G. ULAGANATHAN ROUGH STONE AND GRAVEL QUARRY

At

Sithalappakkam Village, Vembakkam Taluk, Tiruvannamalai District, Tamil Nadu State

TOTAL CLUSTER EXTENT =17.20.50Ha

PROJECT PROPONENT

Proponent Name	S.F.no	Extent (Ha)
Thiru. G. Ulaganathan, S/o. Gomathinayagam No.15/31, Rajaji Street, Radha Nagar, Chromepet Taluk, Kancheepuram District- 600 044	1/2C, 1/3, 1/4, 1/5 & 16/2A	2.39.0Ha

“B1” CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND-PATTA LAND

Complied as per ToR Obtained vide

ToR Identification: T023B0108TN5735410N Dated: 01/04/2024

Environmental Consultant	Laboratory
 GEO EXPLORATION AND MINING SOLUTIONS Old No. 260-B, New No. 17, Advaita Ashram Road, Alagapuram, Salem – 636 004, Tamil Nadu, India  Accredited for sector 1 Category ‘A’,31 & 38 Category ‘B’ Certificate No: NABET/EIA/2225/RA0276 Phone: 0427-2431989, Email: ifthiahmed@gmail.com, geothangam@gmail.com Web: www.gemssalem.com	GLOBAL LAB AND CONSULTANCY SERVICES Approved by ISO:9001:2015, NABL, FSSAI, Experts in QHSE S.F No:92/3A2, Geetha Nagar, Alagapuram Pudur, Salem-636016

Baseline Monitoring Period – Mar 2024 – May 2024

JUNE 2024

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

1. INTRODUCTION

The project proponent Thiru G.Ulaganathan applied for Rough Stone and Gravel Quarry over an extent of 2.39.0 Ha in S.F.No 1/2C, 1/3, 1/4, 1/5 & 16/2A, Sithalapakkam Village, Vembakkam Taluk, Tiruvannamalai District.

- Proponent applied for Rough stone and Gravel quarry lease on 13.09.2022
- Precise area communication letter was issued by the District Collector vide RC. No. 197/Kanimam/2022 Dated 08.09.2023
- The Mining plan has been prepared by the Qualified person and got approval vide Letter RC. No. 197/kanimam/2022 Dated 25.10.2023
- The Mining plan has been approved for the quantity of 2,79,180 m³ of Rough stone 36,316m³ Gravel up to the depth of 37m bgl for the period of ten years.

As per the EIA Notification, 2006 and subsequent amendments and OM The proposal falls in the B1 Category (Cluster quarries - 2 proposal and 5 Existing quarries forming Cluster Category {Total Extent of the Cluster is 17.20.50 Ha}- Cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016).

- Proponent applied for Terms of Reference Identification: T023B0108TN5735410N Dated 01.04.2024
- Based on the ToR Baseline Monitoring study has been carried out for one season ie., **March to May 2024** and this EIA/EMP report is prepared for considering cumulative impacts arising out of this project, the Cumulative Environmental Impact Assessment study is undertaken, which is followed by preparation of a detailed Environmental Management Plan (EMP) to minimize those adverse impacts.

Environmental Impact Assessment (EIA) is the management tool to ensure the sustainable development and it is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision-making tool, which guides the decision makers in taking appropriate decisions for any project. EIA systematically examines both beneficial and adverse consequences of the project and ensures that these impacts are taken into account during the project designing. It also reduces conflicts by promoting community participation, information, decision makers, and helps in developing the base for environmentally sound project

TABLE 1.1: TOR OBTAINED PROJECT

Name of the proponent	Extent (Ha)	Terms of Reference (ToR)
Thiru. G.Ulaganathan	2.39.0	ToR Identification: T023B0108TN5735410N Dated: 01/04/2024

Source: ToR Letter of the respective Proposal project proponent.

The Baseline Monitoring study has been carried out during Post monsoon season Oct2023 to Dec2023 considering the provisions of MoEF & CC Office Memorandum Dated: 29.08.2017 and MoEF & CC Notification S.O. 996 (E) Dated: 10.04.2015.

“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. G.Ulaganathan Rough Stone and Gravel Quarry
Address	S/o. Gomathinayagam, No.15/31, Rajaji Street, Radha Nagar, Chromepet, Kancheepuram-600 044.
Mobile	+91 93609 52091
Email	vanajaulaganathan@gmail.com
Status	Individual

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES					
CODE	Name of the Owner	Village	S.F. Nos	Extent in Ha	Status
P1	Thiru.G. Ulaganathan, S/o,Gomathimayagam, No.15/31, Rajaji street, Radha Nagar, Chrompet, Kancheepuram District	Sithalapakkam	1/2C, 1/3, 1/4, 1/5 & 16/2A	2.39.0	ToR Identification: T023B0108TN5735410 N Dated: 01/04/2024.
P2	Thiru.M.N.Balasundara, S/o,Subramaniyan, No.72, main road, Mankadu,Kundrathur Taluk, Kancheepuram.	Sithalapakkam	8/1A,8/1B,8/ 1C,8/1D, etc.	3.87.5	-
TOTAL EXTENT				6.26.50	
EXISTING QUARRIES					
CODE	Name of the Owner	Village	S.F. Nos	Extent in Ha	Status
E-1	Thiru G.Manavaian, S/o, Govindhanaidu, No.294 perumal koil street, Thenagkulam village, Valajapath Taluk, Kancheepuram	Sithalapakkam	28/12 & 28/13	2.01.5	17.11.2021 to 16.11.2031
E-2	Thiru Muthukrishnan, No.221, Chenjamman Koil street, Chithapakkam village, Vempakkam Taluk, Kancheepuram.	Sithalapakkam	16/6,16/7 & 17/1	1.26.0	22.11.2018 to 21.11.2023
E-3	Thiru C.Sugumar, S/o, Chandrababu, No- 18A, V.V. Kovil street, walajabad taluk, kancheepuram	Ezhacheri	20/1H,20/11, 20/3B,20/3C & 20/3D	1.82.5	16.11.2018 to 15.11.2023
E-4	Tvl.Golden Sands, No.15,4 th street, East coast road, Chennai-115	Ezhacheri	1/2c,1/2B2B ,1/2D,1/7,1/ 8,1/9,20/3A	3.74.5	07.11.2018 to 06.11.2023
E-5	Thiru P.sankar,S/o Ponnapan,No.1/63, pillaiyar koil street,Erumaiyur village, Thirumudivakkam, Chennai-600 044	Ezhacheri	21/2F,2G,2H ,2I,2J & 2k	2.09.5	02.11.2021 to 01.11.2026
TOTAL EXTENT				10.94.0	
ABANDONED QUARRY					

A-1	Thiru M.R.Azhagiri,S/o, M.P.Rajalingam, No.120, Shanmuganandhar,Kovil street, Mangadu, sriperumbuthur Taluk, Kancheepuram district.	Sithalapakkam	8/1A,8/1B, 1C etc..	3.87.5	17.10.2018 to 16.10.2023
TOTAL CLUSTER EXTENT				17.20.50	

TABLE 1.3 SALIENT FEATURES OF THE PROPOSED PROJECT

Name of the Project	Thiru. G.Ulaganathan Rough Stone and Gravel Quarry	
S.F. No.	1/2C, 1/3, 1/4, 1/5 & 16/2A	
Extent	2.39.0 ha	
Village,Taluk and District	SithalapakkamVillage, Vembakkam Taluk, Tiruvannamalai District.	
Land Type	It is a patta lands, registered in the name of the G.Ulaganathan, vide patta No.437	
Toposheet No	57 P/10	
Latitude between	12° 43' 18.0590"N to 12° 43' 24.1463"N	
Longitude between	79° 43' 23.6923"E to 79° 43' 23.6923"E	
Elevation of the area	97m AMSL	
Lease period	10 Years	
Mining Plan period	10 years	
Proposed Depth of Mining	37m bgl (2m Gravel + 35m Rough stone)	
Geological Resources	Rough Stone in m ³	Gravel m ³
	8,36,500	47,800
Mineable Reserves	2,79,180	36,316
Year wise Production for first five years	1,90,015	36,316
Year wise Production for next five years	89,165	-
Peak Production	40,550	19,380
Ultimate Pit Dimension	Pit 1:124m (L) x 75m (W) x 32m(D) bgl Pit 1:102m (L) x 95m (W) x 37m(D) bgl	
Water Level in the region	57 m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and Controlled blasting using Slurry Explosives	
Topography	The lease applied area is plain terrain. The area has gentle sloping towards eastern side and altitude of the area is 97m above from Mean Sea level. The area is covered by 2m thickness of Gravel and followed by Massive Charnockite which is clearly inferred from the surface outcrops & nearby existing quarry pit.	
Machinery proposed	Jack Hammer	5 Nos
	Compressor	2 Nos
	Excavator with Bucket and Rock Breaker	2 Nos
	Tippers	4 Nos
Blasting Method	Controlled Blasting Method by shot hole drilling and small dia of 25mm slurry explosive are proposed to be used for shattering and heaving effect for removal and winning of Rough Stone. No deep hole drilling is proposed.	
Proposed Manpower Deployment	25 Nos	
Project Cost	Rs. 52,17,000/-	
EMP Cost	Rs. 3,80,000/-	

Total Project cost	Rs. 55,97,000/-	
CER Cost	Rs. 5,00,000/-	
Nearby Water Bodies	Kaalvaai	50m Safety_N
	Tank	1.5Km_NE
	Cheyar River	2.7km_SE
	Tank	3.5Km_SW
	canal	3.6Km_N_Canal
	Palar River	7Km_NE
	Mamandur Lake	7Km_NW
	Uthiramerur Lake	8.3km_SE
Greenbelt Development Plan	Proposed to plant 1200 Nos of trees considering 500 Nos of trees/ Ha criteria The plantation will be developed around the project site and nearby village roads	
Proposed Water Requirement	1.5 KLD	
Nearest Habitation	990m – South west	
Nearest Reserve Forest	Marudham R.F – 7.5 Km – SE (Source - TNGIS)	
Nearest Wild Life Sanctuary	Karikili Birds Sanctuary – 18 Km – SE Karikili Birds Sanctuary + 5km Safety distance – 13km - SE	

Source: Approved mining plan.

1.3 STATUTORY DETAILS

SCREENING

- ∞ Proponent applied for Rough stone and Gravel quarry lease on 13.09.2022
- ∞ Precise area communication letter was issued by the District Collector vide RC. No. 197/Kanimam/2022 Dated 08.09.2023
- ∞ The Mining Plan was prepared by Recognized Qualified Person and approved by Assistant Director, Geology and Mining, Tiruvannamalai District, vide RC.No. 197/kanimam/2022 Dated 25.10.2023
- ∞ 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
- ∞ Proponent applied for ToR for Environmental Clearance vide online Proposal No. SIA/TN/MIN/453826/2023. dated: 30.11.2023.

SCOPING

- ∞ The proposal was placed in 441th SEAC meeting held on 31.01.2024 and the committee recommended for issue of ToR.
- ∞ The proposal was considered in 698thSEIAA meeting held on 19.02.2024 and issued Terms of Reference Identification: T023B0108TN5735410N Dated 01.04.2024.

2. PROJECT DESCRIPTION

Applied Proposed Quarry in Sithalapakam Village, Vembakkam Taluk, Thiruvannamalai District and Tamil Nadu State falls under Cluster Situation as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016 and the total extent of cluster is 17.20.50 ha consisting of three quarries. As the extent of cluster is more than 5 ha, the proposal falls under B1 Category as per the 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, and requirement for EIA, EMP and Public Consultation for obtaining Environmental Clearance.

For the project

- The area is Existing land, mining activities carried out before, Topography of the area is elevated and slightly undulated terrain with gentle gradient towards South Eastern side. 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/Existing quarry.
- Multicoloured Granite Quarry operation will be carried out by opencast mechanized method involving Eco-friendly Diamond Wire Saw Cutting, Heavy earth moving machineries like Excavators Trucks for Granite exploitation. Shot hole drilling with controlled blasting using slurry explosives for removal of overburden and Weathered portions during initial stage of quarry operation.

2.1 SITE CONNECTIVITY TO THE PROJECT AREA

Nearest Roadway	NH – 132B – Kancheepuram – Chengalpattu -10.0 km -NE SH – 118A – Kancheepuram – Uthiramerur -3.0km-East
Nearest Village	Sithalapakkam– 1.52 Km – North East
Nearest Town	Magaral - 3.0km – SE
Nearest Railway Station	Kancheepuram – 13.0km – NW
Nearest Airport	Chennai - 75.0km – NE
Seaport	Chennai - 75.0km – NE

2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

Description	Present area (Ha)	Area required during the First five years (Ha)	Area at the end of lease period (Ha)
Area under quarrying	Nil	1.72.0	1.72.0
Infrastructure	Nil	0.01.0	0.01.0
Roads	Nil	0.02.0	0.02.0
Green Belt	Nil	0.20.47	0.42.0
Unutilized Area	2.39.0	0.44.0	0.22.0
Grand Total	2.39.0	2.39.0	2.39.0

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

PARTICULARS	DETAILS	
	Rough Stone in m ³	Gravel in m ³
Geological Resources	8,36,500	47,800
Mineable Reserves	2,79,180	36,316
Production for first five-year plan period	1,90,015	36,316
Production for second five-year plan period	89,165	-
Peak Production	40,550	19,380
Mining Plan Period / Lease Applied Period	10 Years	
Number of Working Days	300 Days	
Production per day	126	40
No of Lorry loads (12m ³ per load)	11	3
Total Depth of Mining	37m (2m Gravel +35m Rough stone) below ground level.	

FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA

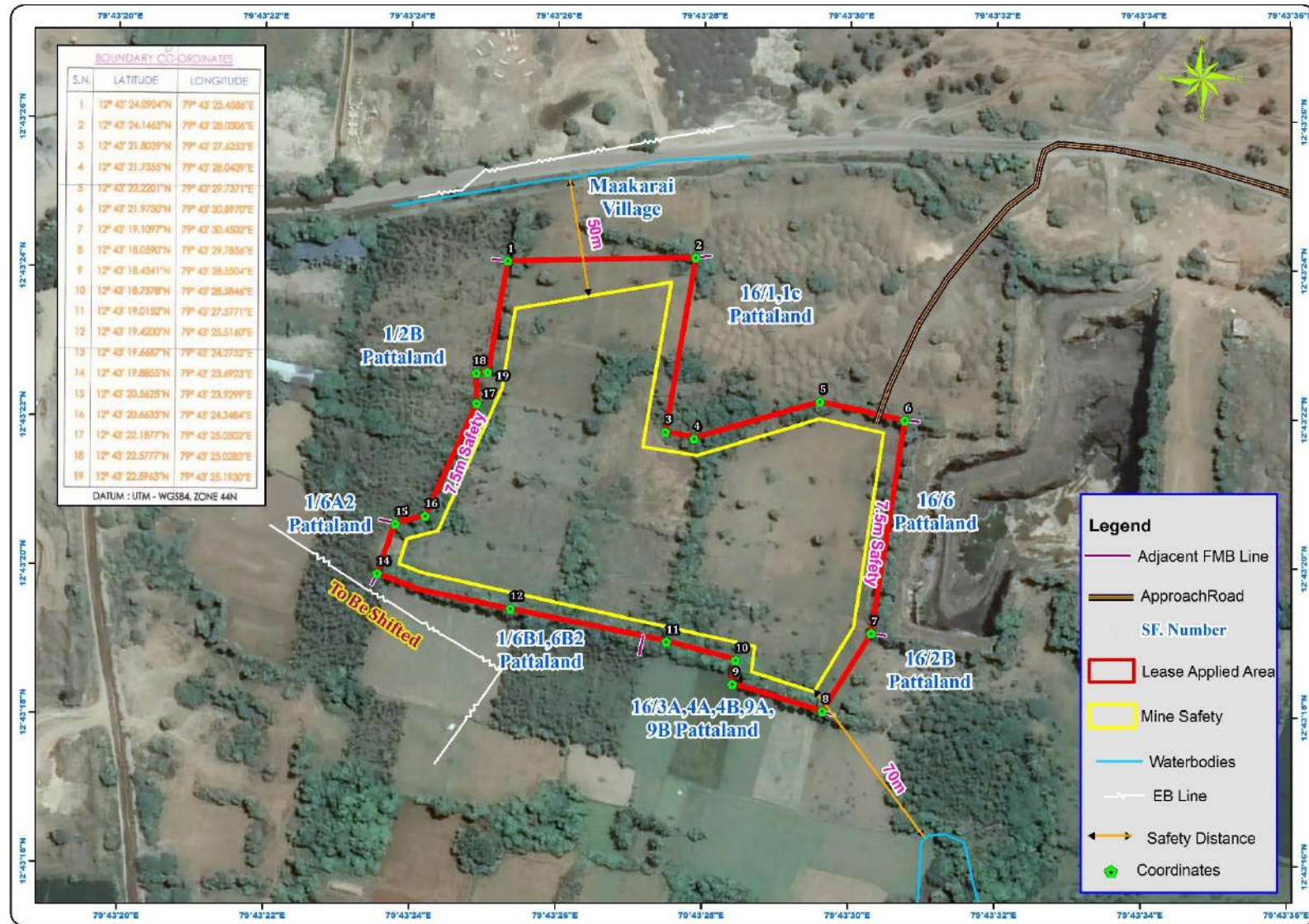


FIGURE – 3: GOOGLE IMAGE SHOWING CLUSTER (500m QUARRIES)

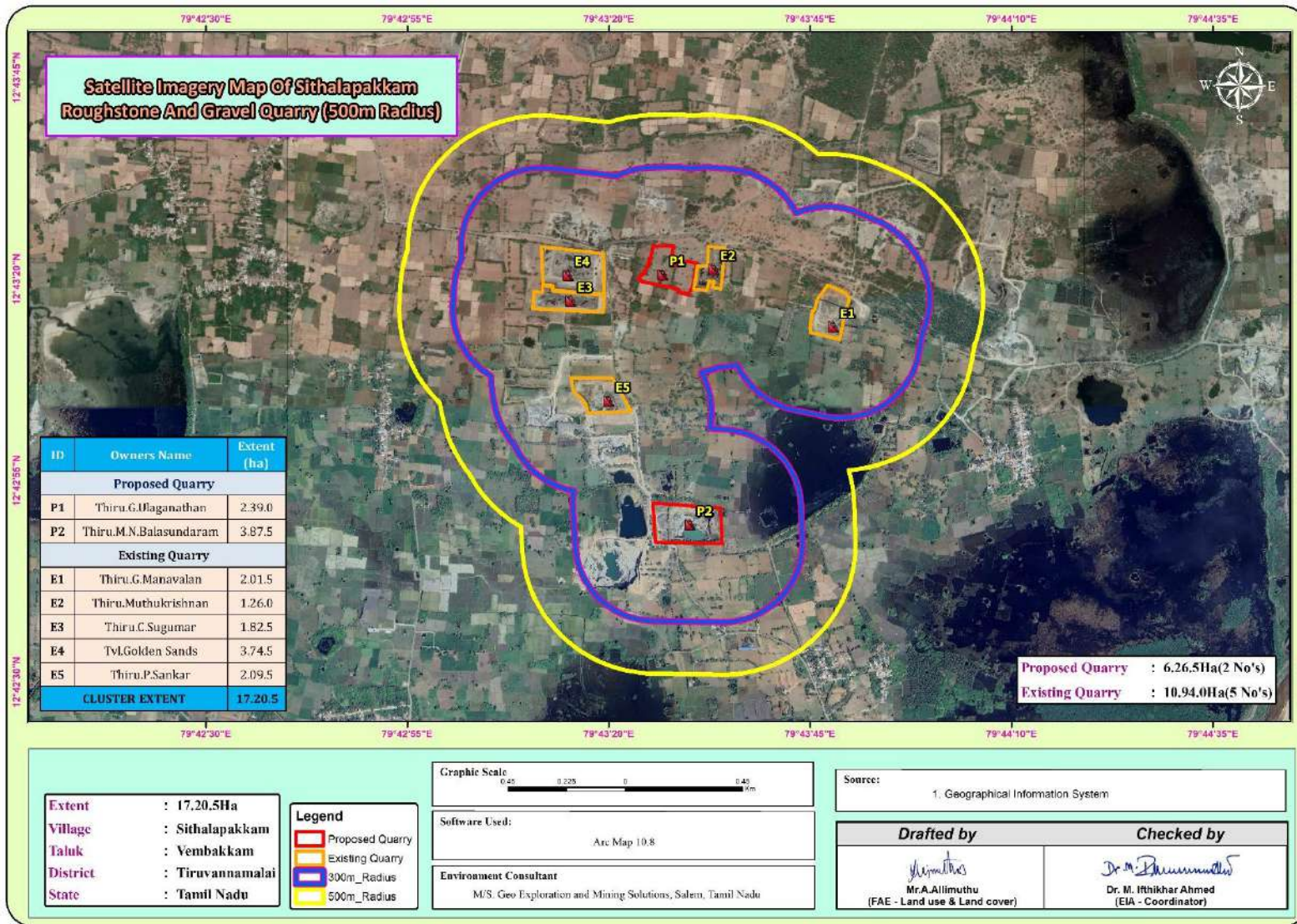


FIGURE – 4: TOPOSHEET MAP COVERING 10 KM RADIUS

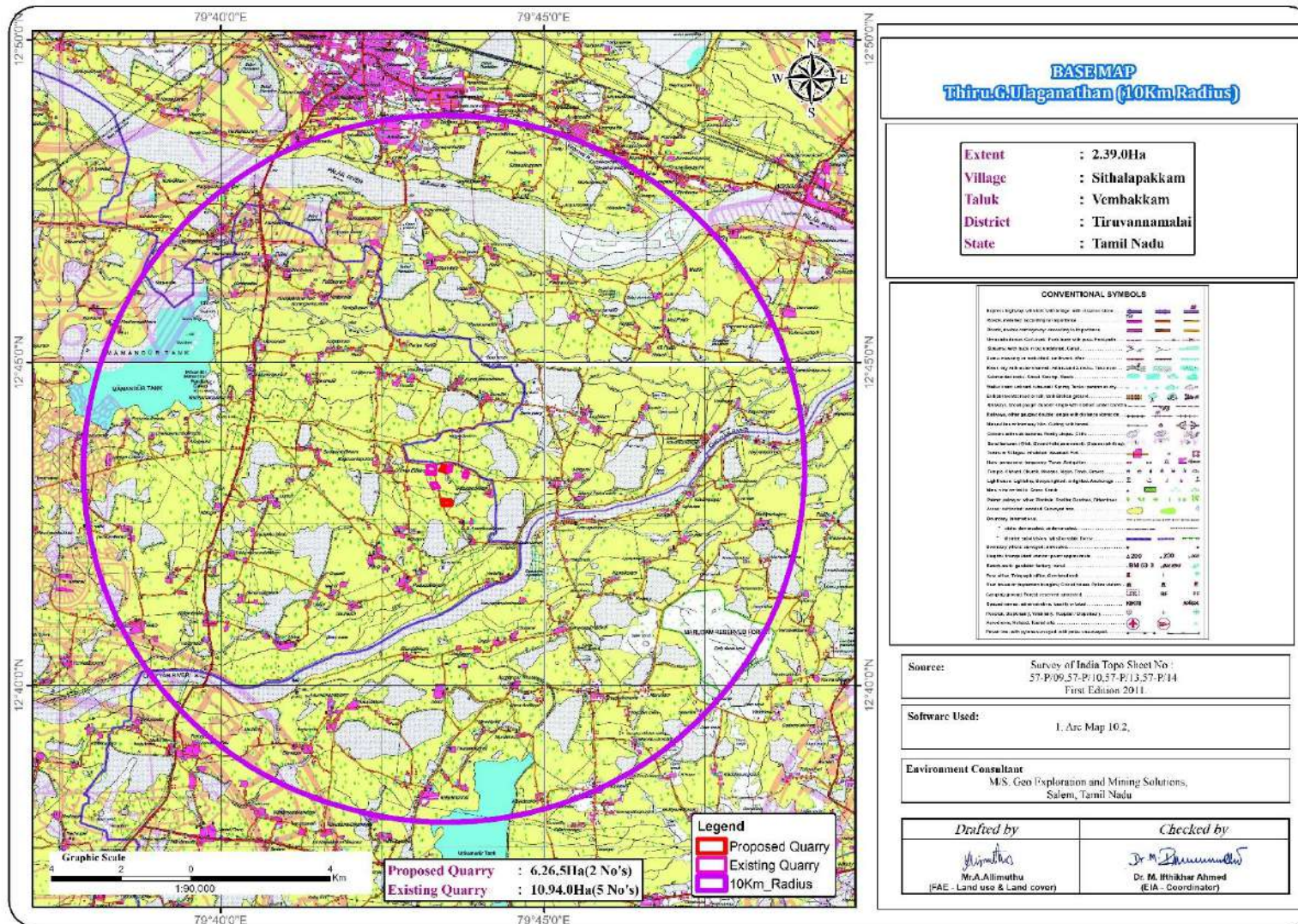


FIGURE – 5: QUARRY LEASE PLAN & SURFACE PLAN

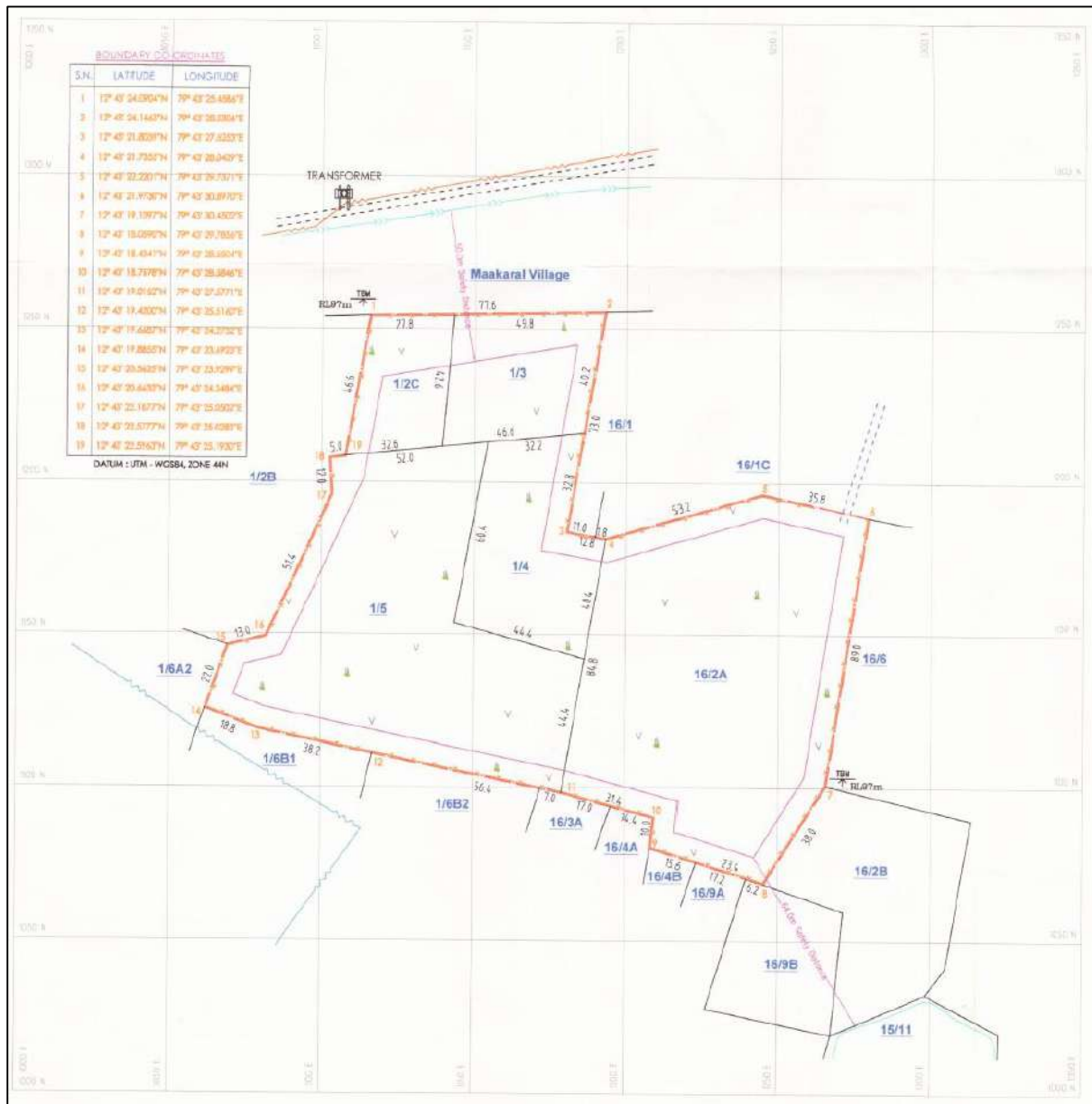


Figure 6 PHOTOGRAPHS OF THE PROJECT AREA**Figure 7: FENCING AND PLANTATION PHOTOGRAPHS****2.4 METHOD OF MINING**

Opencast Mechanized Mining Method is proposed by formation of 5.0-meter height bench with a bench width not less than the bench height. Bench slope will be maintained as 60°.

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 Excavator attached with rock breaker/ bucket with tipper combination will be involved for the excavation/breaking of Rough stone after blasting. 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.

It is recommended to obtain necessary statutory permission from the Department of Geology and Mining for Using Heavy Earth Moving Machineries, Blasting and appointment of Mines Manager etc

2.5 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	5	1.2m to 2.0m	Compressed air
2	Compressor	2	400psi	Diesel Drive
3	Excavator with Bucket and Rock Breaker	2	300 HP	Diesel Drive
4	Tippers	4	20 Tonnes	Diesel Drive

2.7 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.

2.8 ULTIMATE PIT DIMENSION

Pit	Length In m	Width in m	Depth in m
I	124	75	32
II	102	95	37m

3.0 DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out covering Mar 2024 & May 2024 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by Global Lab and Consultancy Services, – An accredited by ISO/IEC 17025:2017 (NABL) Laboratory.

3.1 ENVIRONMENT MONITORING ATTRIBUTES

Attribute	Parameters	Frequency of Monitoring	No. of Locations	Protocol
Land-use Land cover	Land-use Pattern within 10 km radius of the study area	Data from census handbook 2011 and from the satellite imagery	Study Area	Satellite Imagery Primary Survey
*Soil	Physio-Chemical Characteristics	Once during the study period	6 (1 core & 5 buffer zone)	IS 2720 Agriculture Handbook - Indian Council of Agriculture Research, New Delhi
*Water Quality	Physical, Chemical and Bacteriological Parameters	Once during the study period	6 (2 surface water & 4 ground water)	IS 10500& CPCB Standards
Meteorology	Wind Speed Wind Direction Temperature Cloud cover Dry bulb temperature Rainfall	1 Hourly Continuous Mechanical/Automatic Weather Station	1	Site specific primary data& Secondary Data from IMD Station

*Ambient Air Quality	PM10 PM2.5 SO2 NOX Fugitive Dust	24 hourly twice a week (March to May 2024)	7 (2 core & 5 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	8 (2 core & 6 buffer zone)	IS 9989 As per CPCB Guidelines
Ecology	Existing Flora and Fauna	Through field visit during the study period	Study Area	Primary Survey by Quadrante & Transect Study Secondary Data – Forest Working Plan
Socio Economic Aspects	Socio-Economic Characteristics, Population Statistics and Existing Infrastructure in the study area	Site Visit & Census Handbook, 2011	Study Area	Primary Survey, census handbook & need based assessments.

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.

Table 3.1: Land Use / Land Cover Table 10 Km Radius

வ.எண்	CLASSIFICATION	AREA in HA	AREA in %
BUILTUP			
1	Builtup Urban	362.47	1.13
2	Builtup Rural	825.25	2.57
3	Builtup Mining	456.96	1.43
AGRICULTURAL LAND			
4	Crop Land	19974.36	62.32
5	Agriculture Land	1007.12	3.14
6	Fallow Land	266.64	0.83
BARREN/WASTE LANDS			
7	Barren Rocky	267.36	0.83
8	Scrub Land	278.20	0.87
9	Salt Affected Area	1109.17	3.46
FOREST			
10	Forest	470.06	1.47
WETLANDS/ WATER BODIES			
11	Waterbodies	7033.86	21.95
TOTAL		32051.45	100.00

Source: Bhuvan, NRSC

From the above table and land use map it is inferred that the majority of the land in the study area is Agriculture and fallow land (includes crop land) 66.29% followed by Built-up Lands – 5.13%, Scrub land – 0.87%, and Water bodies 21.95%.

The total mining area within the study area is 456.96 ha i.e., 1.43%. The cluster area of 17.20.0 ha contributes about 3.76% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment

3.3 SOIL ENVIRONMENT

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density and water holding capacity. The soil texture found in the study area is Clay Loam Soil and Bulk Density of Soils in the study area varied between 1.0 – 1.048 g/cc. The Water Holding Capacity between 50.2% - 52.8%.

- ∞ The nature of soil is slightly alkaline to strongly alkaline with pH range 8.04 to 8.84
- ∞ The available Nitrogen content range between 313.6 to 526.84 kg/hc
- ∞ The available Phosphorus content range between 15.8 to 19.5 Mg/Kg
- ∞ The available Potassium range between 1.05 to 1.28 meq/l

Whereas, the micronutrient as zinc (Zn) and iron (Fe) were found in the range of 7.21 to 19.91 mg/kg; 11.23 to 27.60 mg/kg.

3.4 WATER ENVIRONMENT

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 7.16 to 7.51 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 734 to 803 mg/l, the TDS mainly composed of carbonates, bicarbonates, Chlorides, phosphates and nitrates of calcium, magnesium, sodium and other organic matter.

Other parameters:

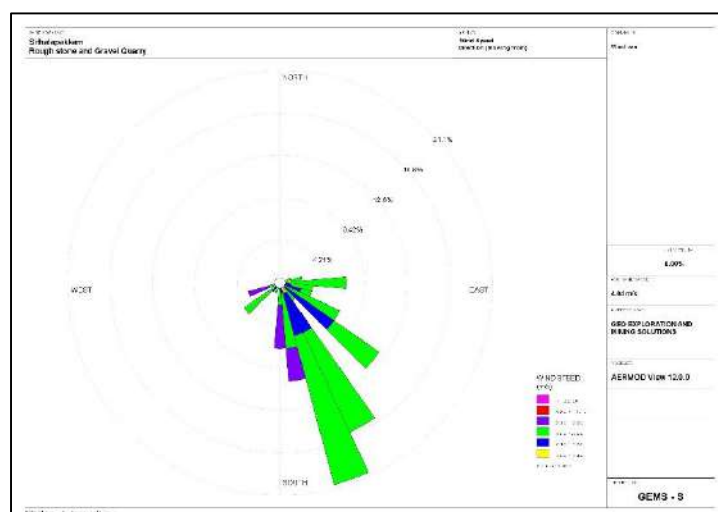
Chloride content is 163.95 to 195.93mg/l. Nitrates varied from 5.18 to 5.74 mg/l, while sulphates varied from 49.52 to 51.33 mg/l.

Ground Water

The pH of the water samples collected ranged from 7.24 to 7.91 and within the acceptable limit of 6.5 to 8.5. pH, Sulphates and Chlorides of water samples from all the sources are within the limits as per the Standard. On Turbidity, the water samples meet the requirement. Total Dissolved Solids were found in the range of 694 to 758mg/l in all samples. Total hardness varied between 272 to 296 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 – 10: WIND ROSE DIAGRAM

3.6 SUMMARY OF AMBIENT AIR QUALITY

The results of ambient air quality monitoring for the period (Mar-May 2024) are presented in the report. Data has been compiled for three months.

As per monitoring data, PM10 ranges from 42.5 $\mu\text{g}/\text{m}^3$ to 46.7 $\mu\text{g}/\text{m}^3$, PM2.5 data ranges from 18.7 $\mu\text{g}/\text{m}^3$ to 22.0 $\mu\text{g}/\text{m}^3$, SO2 ranges from 4.2 $\mu\text{g}/\text{m}^3$ to 9.1 $\mu\text{g}/\text{m}^3$ and NO2 data ranges from 18.4 $\mu\text{g}/\text{m}^3$ to 24.5 $\mu\text{g}/\text{m}^3$. 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 8 (Eight) locations around the proposed project area. Noise levels recorded in core zone during day time were from 43.1- 44.4 dB (A) Leq and during night time were from 36.0-37.6 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 45.7 to 50.6 dB (A) Leq and during night time were from 37.7 to 39.0 dB (A) Leq. 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 38 persons to the local people there by improving the indirect employment opportunity in the area were around 100 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

- 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 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 Soil Environment

Impact on Soil Environment

Erosion and Sedimentation (Removal of protective vegetation cover; Exposure of underlying soil horizons that may be less pervious, or more erodible than the surface layers; Reduced capacity of soils to absorb rainfall; Increased energy in storm-water runoff due to concentration and velocity; and Exposure of subsurface materials which are unsuitable for vegetation establishment).

Mitigation measures for Soil Conservation

- Run-off diversion – Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry works areas. And will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season

4.3 WATER ENVIRONMENT

- 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 drain, settling tank will be constructed along the project area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear water will be discharged out to the natural drainage
- 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

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 Granite.

ANTICIPATED IMPACT

- Garland drain, settling tank will be constructed along the proposed mining lease area. The Garland drain will be connected to settling tank and sediments will be trapped in the settling traps and only clear 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 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 system.
- 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 (every 6 month once) 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 (every 6 month once) and analysing the quality of water in open well, bore wells and surface water.

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

- Blasting will be carried out only to remove the overburden and weathered portion
- Establish time of blasting to suit the local conditions and water sprinkling on blasting face
- Controlled blasting includes 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

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 months 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

Keeping all this in mind the mitigations have been suggested under environmental management plan. With the understanding of the role of plant species as bio-filter to control air pollution, appropriate plant species (mainly tree species) have been suggested conceding the area/site requirements and needed performance of specific species. The details of year wise proposed plantation program are given in Table 4.13.

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas

In order to compensate the loss of vegetation cover, it is suggested to carry out afforestation program mainly in proposed areas falls in the cluster earmarked for plantation program as per Approved Mining Plan in different phases. This habitat improvement program would ensure the faunal species to re-colonize and improve the abundance status in the core zone.

The objectives of the green belt cover will cover the following:

- Noise abatement
- Ecological restoration
- Aesthetic, biological and visual improvement of area due to improved vegetative and plantations cover.

4.6 SOCIO ECONOMIC ENVIRONMENT

ANTICIPATED IMPACT

Impact and Mitigation Measures: The proposed project could result due to migrant workers, worker camps, induced development etc. Due to the migrant workers, there would impact on the existing infrastructure facilities in the surrounding villages. The impact of the proposed project on socio economic conditions of the study area is as follows.

Impacts		Mitigation measures
Positive	Negative	
It would generate employment opportunities to the local people and reduce the migrants to outside ➤ Increase of floating population.	➤ There will be structural changes in occupation and alternative works will be performed.	➤ To prevent the air, water and noise pollution for this implements the adequate scientific measures (treat)

<p>➤ Increase in demand of services includes hotels, lodges, public transport (including taxis), etc.</p> <p>➤ Economic up liftment of the area.</p> <p>➤ Rapid growth of sector will result in increase of incomes in the area.</p> <p>➤ Expanding of services like retail shops, banks, automobile workshops, school, health care, etc.</p> <p>➤ The project would also trigger many direct and indirect benefits for economic advancement and social development of project area.</p>	<p>➤ Expecting release of surreptitiously air Pollution during the operation period.</p> <p>➤ Loss of cultivable lands.</p> <p>➤ Increase in the cost of man power in the agriculture sector due to Industrial/Mining services wage rates. This has affected cultivation.</p> <p>➤ Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area.</p>	<p>as per the pollution control regulatory standards.</p> <p>➤ Employment facilities to the local people on the priority bases to the impacted families who lost their land due to the proposed Project.</p> <p>➤ Periodical monitoring of the families in surrounding villages. Regular medical check-up and developing infrastructure.</p> <p>➤ Initiating Skill development programs for better opportunities for the educated youth.</p> <p>➤ Dust and air control twice time using water sprinkler.</p> <p>➤ Greenbelt will be developed in and around the project site</p>
--	--	--

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

No alternatives are suggested as all the mine sites are mineral specific

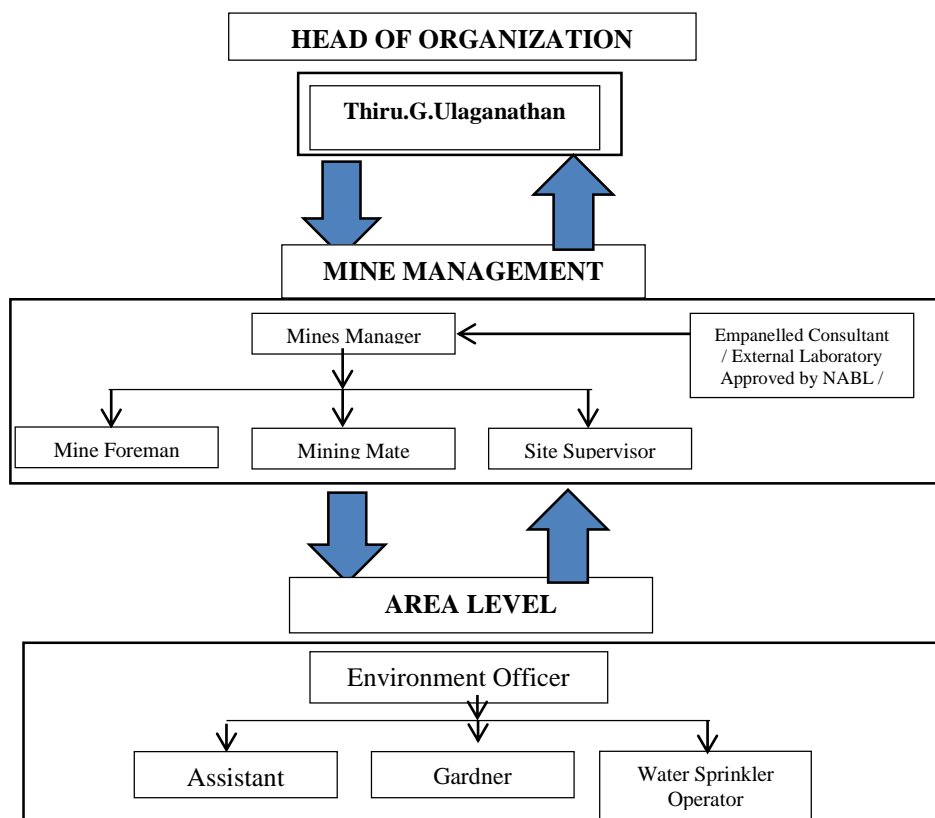
6. ENVIRONMENT MONITORING PROGRAM

An Environment monitoring cell (EMC) will be constituted to monitor the implementation of EMP and other environmental protection measures in all the proposed quarries.

The responsibilities of this cell will be:

- Implementation of pollution control measures
- Monitoring programme implementation
- Post-plantation care
- To check the efficiency of pollution control measures taken
- Any other activity as may be related to environment
- Seeking expert's advice when needed

6.1 ENVIRONMENTAL MONITORING CELL



6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 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	2 Locations (1 SW & 1 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	2 Locations (1 Core & 1 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	2 Locations (1 Core & 1 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	Production for five-year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day
P1	1,90,015	38,003	127	11
Total	1,90,015	38,003	127	11
E1	2,71,880	54,376	182	15
E2	79,450	15,890	53	5
E3	-	-	-	-
E4	4,18,040	83,608	278	24
E5	2,86,685	57,337	191	16
Total	10,56,055	2,11,211	704	60
Grand Total	12,46,070	2,49,214	831	71

Source: Mining Plan

CUMULATIVE PRODUCTION LOAD OF GRAVEL

Quarry	Production for five-year plan period	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day
P1	36,316	12,105	41	4
Total	36,316	12,105	41	4
PROPOSED PRODUCTION OF GRAVEL				
E1	47,979	15,993	54	5
E2	22,614	7,538	25	2
E3	-	-	-	-
E4	39,600	13,200	44	4
E5	16,320	5,440	18	2
Total	1,26,513	42,171	141	13
Grand Total	1,62,829	54,276	182	17

PREDICTED NOISE INCREMENTAL VALUES

Location ID	Background Value (Day) dB(A)	Incremental Value dB(A)	Total Predicted dB(A)	Residential Area Standards dB(A)
Habitation Near P1	48.2	47.3	46.3	55
Habitation Near E1	36.5	48.1	48.4	
Habitation Near E2	37.5	48.2	48.3	
Habitation Near E3	36.8	49.2	49.1	
Habitation Near E4	37.4	48.5	48.6	
Habitation Near E5	35.4	47.4	47.7	

SOCIO ECONOMIC BENEFITS FROM CLUSTER QUARRIES

Location ID	Project Cost	CER
P1	Rs.66,16,000	Rs.5,00,000
E1	Rs.67,31,000/-	Rs.1,34,000
E2	Rs.56,39,000/-	Rs.1,13,000
E3	-	-
E4	Rs.66,50,000/-	Rs.1,33,000
E5	Rs.50,17,500/-	Rs.1,00,000
Total	Rs3,06,53,500/-	Rs.9,80,000

8. PROJECT BENEFITS

There is one applied proposed project for Thiru.G. Ulaganathan Rough Stone and Gravel Quarry village aims to Proposed production 1,90,015 (Rough Stone for five-year period) for Life of Mine of 10 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 Granite and enhance the foreign exports

9. 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.

10. 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.
