

EXECUTIVE SUMMARY

Rough Stone Quarry of

M/s. A.V.S. Tech Building Solutions India Pvt Ltd.

NAME OF PROPOSED PROJECT

Name of Proponent and address	Area Extent
M/s. A.V.S. Tech Building Solutions India Pvt Ltd., S.Srinivasan (managing Director) No.292, Sipcot Housing Board Colony, Mookandapalli, Hosur Taluk, Krishnagiri District - 635 126.	S.F.No. 662 (P), 2.20.0 Ha, Thorapalli Agraharam Village of Hosur Taluk, Krishnagiri District.

“B1” CATEGORY/ MINOR MINERAL /CLUSTER/ NON-FOREST LAND/ GOVT. LAND

* CLUSTER EXTENT = 6.97.5 ha

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

ToR Obtained vide

1. Lr No. SEIAA-TN/F.No.8711/SEAC/ToR- 1049/2022 Dated: 31.01.2022

Environmental Consultant

GEO EXPLORATION AND MINING SOLUTIONS 

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Advaitha Ashram Road, Alagapuram,

Salem – 636 004, Tamil Nadu, India



Accredited for sector 1 Category ‘A’ & 38 Category ‘B’

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ENVIRONMENTAL LAB

KGS ENVIRO LABORATORY PVT LTD

No.16, F1, Bharathi Flats, Bharathiar Street, Cholambedu Main Road,

Thirumullaivoyal, Chennai – 600 062.

Baseline Monitoring Season – Mar 2022 to May 2022

JULY 2023

1. INTRODUCTION

Rough Stone quarry are the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of Thorapalli Agraharam Rough Stone Quarry Cluster Quarries consisting of one Proposed quarry with total extent of Cluster of 6.97.5 Ha in Thorapalli Agraharam Village of Hosur Taluk, Krishnagiri District, Tamil Nadu State cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016

The proponent has obtained necessary statutory clearances from the Department of Geology and Mining, Krishnagiri District, Tamil Nadu (Statutory Clearance Documents are enclosed along with Mining plan as Annexure No III). The total Extent of the quarries within the radius of 500m from this proposal is > 5Ha, hence the proposal falls under “B1” Category project as per the EIA notification, 2006 (As amended timely).

Proponent applied for Environmental Clearance to SEIAA, Tamil Nadu and obtained

CODE	Name of the proponent	Extent (Ha)	Terms of Reference (ToR)
P1	M/s. A.V.S. Tech Building Solutions India Pvt Ltd,	2.20.0	LrNo.SEIAA-TN/F.No.8711/SEAC/ToR-1049/2022 Dated: 31.01.2022
	Total	2.20.0	

for carrying out EIA and EMP studies for the rough stone quarry.

To carry out the EIA studies and to prepare EIA and EMP studies the proposed & existing quarries of Thorapalli Agraharam Village Rough Stone Cluster Quarries have engaged a consultant M/s. Geo Exploration and Mining Solutions, Salem, Tamil Nadu. The Baseline Monitoring study has been carried out during Summer season (period of Mar2022 -May 2022) 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

PROPOSAL – P1	
Name of the Company	M/s. A.V.S. Tech Building Solutions India Pvt Ltd., S.Srinivasan (managing Director)
Address	No.292, Sipcot Housing Board Colony, Mookandapalli, Hosur Taluk, Krishnagiri District - 635 126.
Mobile	+91 88259 41719
Status	Company
Lease Period	5 Years

The project proponent is a firm/company

1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRY					
CODE	Name of the Proponent and Address	S.F. Nos, Village & Taluk	Extent in Ha	G.O. No & Date	Status
P1	M/s. A.V.S. Tech Building Solutions India Pvt Ltd., S.Srinivasan (managing Director) No.292, Sipcot Housing Board Colony, Mookandapalli, Hosur Taluk, Krishnagiri District - 635 126.	662 (P) Thorapalli Agraharam Village of Hosur Taluk	2.20.0 Ha,	Roc.217/2019/Mines dated: 13.06.2019	Lr No.SEIAA-TN/F.No.8711/SEAC/ToR-1049/2022 Dated: 31.01.2022
Total Extent			2.20.0 Ha		
EXISTING QUARRY					
CODE	Name of the Proponent and Address	S.F. Nos, Village & Taluk	Extent in Ha		Lease Period
E1	M/s. A.V.S. Tech Building Solutions India Pvt Ltd.,	663/1A(P),1B1 (P), 1B2 (P) etc	4.77.5	Roc.680/2016/Mines dated: 05.12.2019	05.12.2019-04.12.2024
ABANDONED/EXPIRED QUARRIES					
CODE	Name of the Proponent and Address	S.F. Nos, Village & Taluk	Extent in Ha		Lease Period
NIL					
TOTAL CLUSTER EXTENT			6.97.5Ha		

TABLE 1.3 SALIENT FEATURES OF THE PROPOSAL

SALIENT FEATURES OF PROPOSAL "P1"		
Name of the Mine	M/s. A.V.S. Tech Building Solutions India Pvt Ltd, Rough Stone Quarry Project	
Land Type	It is a Government Land.	
S.F. Nos	662 (P)	
Extent	2.20.0 Ha	
Previous quarry operation details	It is a Existing quarry pits.	
Geological Reserves	Rough Stone quarry	TopSoil
	8,66,891m ³	14,467m ³
Mineable Reserves	Rough Stone quarry	TopSoil
	3,04,455m ³	7,344 m ³
Proposed production for Five years	3,04,455m ³ (Depth 51m AGL)	
Mining Plan Period / Lease Period	5 Years	
Depth of mining	51m (16m Agl+35m Bgl)	
Existing Pit Dimension	160m(L) x 60m (W) x19.5m(D)	
Ultimate Pit Dimension	Pit I 186m(L) x 62m (W) 51m(D) (16m Agl +35m Bgl) Pit II 156m(L) x 40m (W)	

Toposheet No	57 H/14	
Latitude	12°41'35.04''N to 12°41'45.02''N	
Longitude	77°54'06.94''E to 77°54'14.16''E	
Highest elevation	The lease applied area exhibits an undulated topography. The area has gentle sloping towards Southern side. The altitude of the area is 812m (max) above Mean Sea level.	
Ground water level	The Ground water is about 70m - 65m depth from ground level.	
Water requirement & source	Total water requirement for 3.0KLD from water vendors & nearby Bore well.	
Machinery proposed	Jack Hammer	8
	Compressor	2
	Excavator with Bucket and Rock Breaker	2
	Tipplers	3
Blasting	Usage of Slurry Explosive with MSD detonators	
Manpower Deployment	32 Nos	
Total Project Cost	Operational Cost	Rs.1,61,43,000/-
	EMP Cost	Rs. 3,80,000/-
	Total	Rs.1,65,23,000/-
CER Cost	Rs.5,00,000/-	
Habitation	700m-NW	

1.3 STATUTORY DETAILS

- ☞ The proponent applied for Rough Stone quarry Lease Dated: 21.02.2019.
- ☞ Precise Area Communication was issued by the District Collector, Krishnagiri vide Rc.No.217/2019/Mines, Dated: 13.06.2019.for a period of 5 years Preparation of mining plan.
- ☞ The mining plan was approved by the Deputy Director, Department of Geology and Mining, Krishnagiri District vide Rc.No.217/2019/Mines, Dated: 24.06.2019.
- ☞ Proponent applied for ToR for Environmental Clearance vides online Proposal No. **SIA/TN/MIN/64324/2021, Dated:30.06.2021.**
- ☞ The proposal was placed in 237th SEAC meeting held on 08.10.2021 and the committee recommended for issue of ToR.
- ☞ The proposal was considered in 481th SEIAA meeting held on 24.01.2022 and 25.01.2022 issued ToR vide **Lr No. SEIAA-TN/F.No.8711/SEAC/ToR- 1049/2022 Dated: 31.01.2022**

1.4 PROJECT DESCRIPTION

The proposed project is site specific and there is no additional area required for this project. There is no effluent generation/discharge from the proposed quarries. 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 Roadway	NH – 44 – Bangalore – Salem – 1.0km – NE SH – 17 – Hosur – Dharmapuri – 4.0km – SW
Nearest Village	Islampuram – 1.0km – NW
Nearest Town	Hosur – 9.0km – NW
Nearest Railway	Hosur – 9.0km – NW
Nearest Airport	Bangalore Airport – 60Km - NW

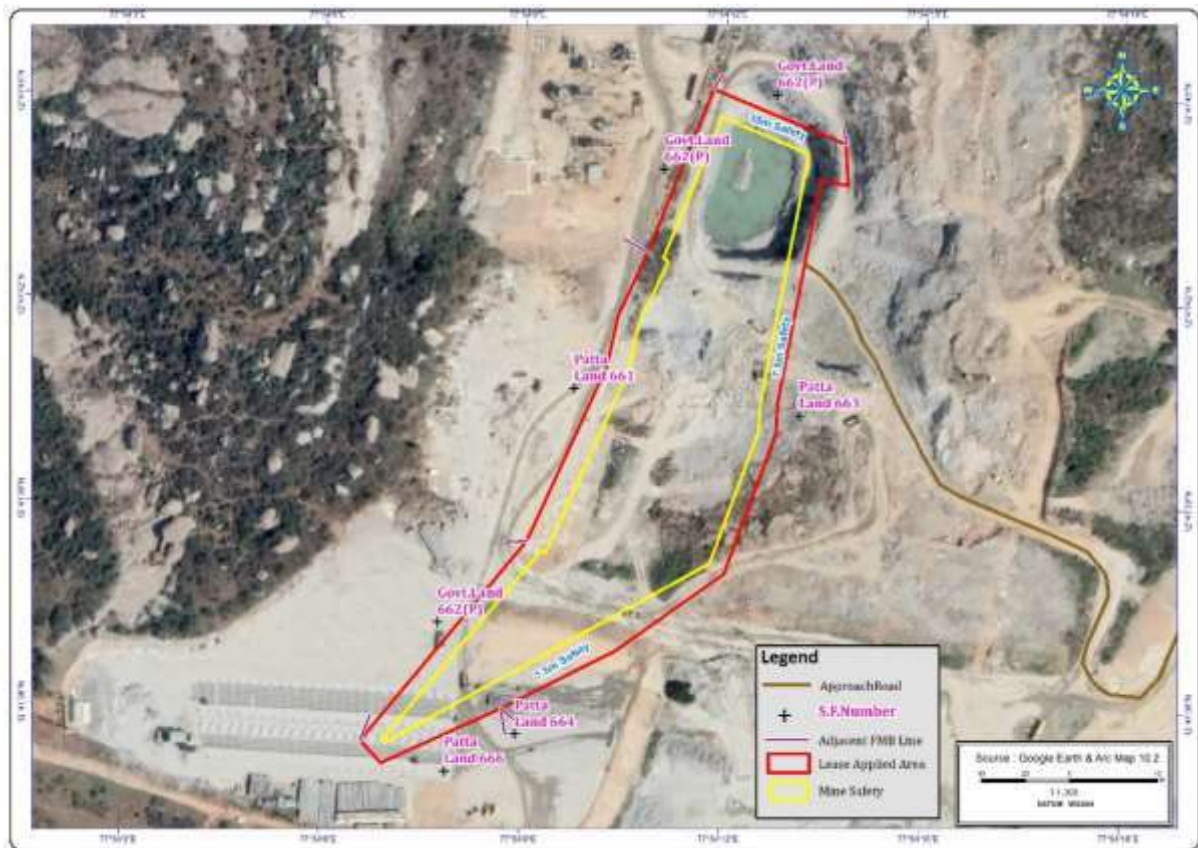
2.2 LAND USE PATTERN OF THE PROPOSED PROJECT

<i>Description</i>	<i>Present area (Ha)</i>	<i>Area at the end of Lease period (Ha)</i>
Area Under Quarrying	0.85.7	1.63.3
Infrastructure	Nil	0.01.0
Roads	0.02.0	0.02.0
Green Belt	Nil	0.15.0
Unutilized Area	1.32.3	0.38.7
Grand Total	2.20.0	2.20.0

2.3 OPERATIONAL DETAILS OF LEASE APPLIED AREA

OPERATIONAL DETAILS FOR PROJECT – P1		
PARTICULARS	DETAILS	
	Rough Stone quarry (m³) (5 Year Plan period)	Top Soil (m³) (2Years Plan period)
Geological Resources	8,66,891	14,467m ³
Mineable Reserves	3,04,455m ³	7,344 m ³
Production for five-year plan period	3,04,455 m³	7,344 m ³
Mining Plan Period / Lease Applied Period	5Years	
Number of Working Days	300 Days	
Production per day	203	12
No of Lorry loads (6m ³ per load)	34	2
Total Depth of Mining	51m (16m Agl+35m Bgl)	

FIGURE – 1: GOOGLE IMAGE SHOWING PROJECT AREA



SATELLITE IMAGERY OF P1

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

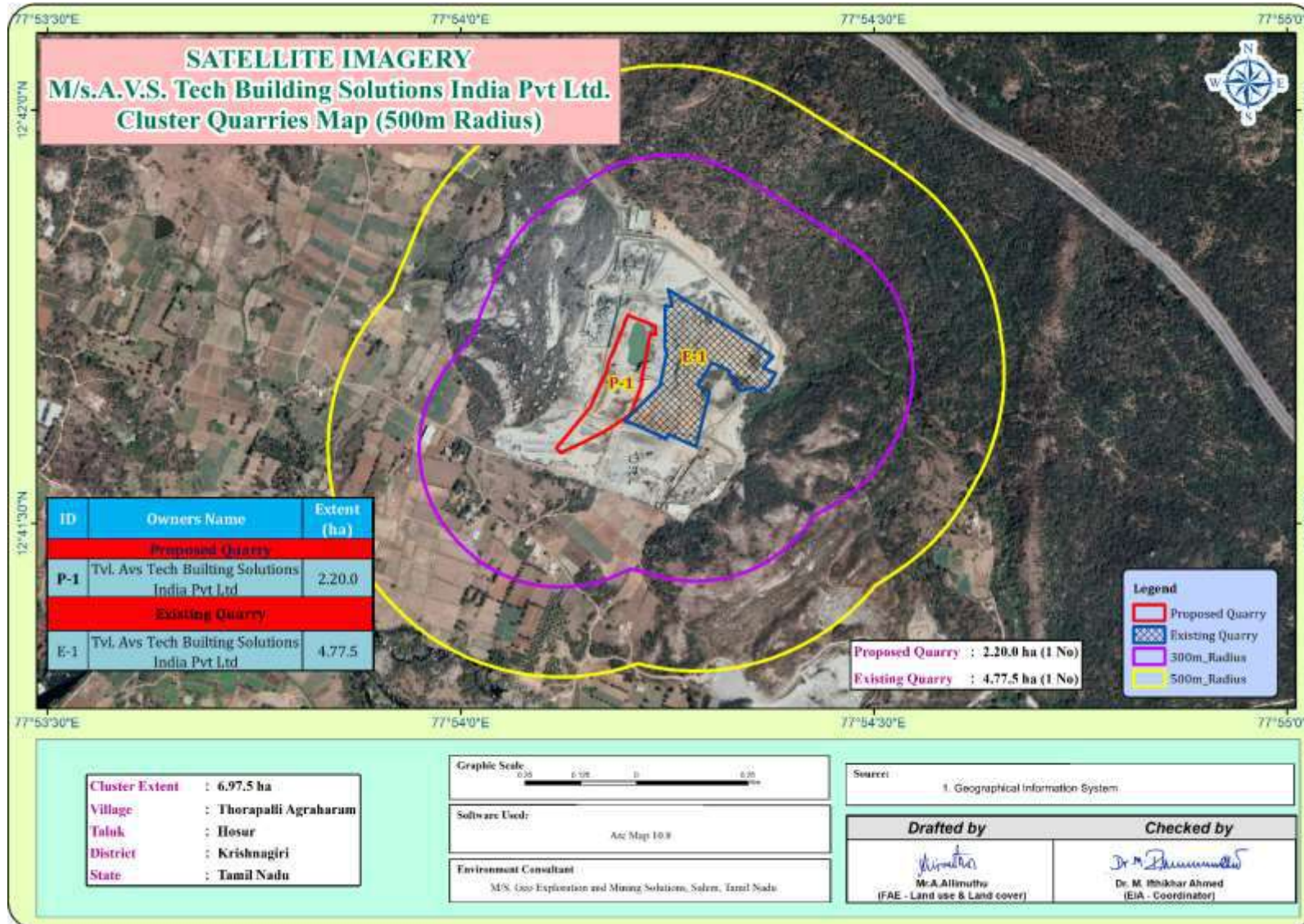


FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS

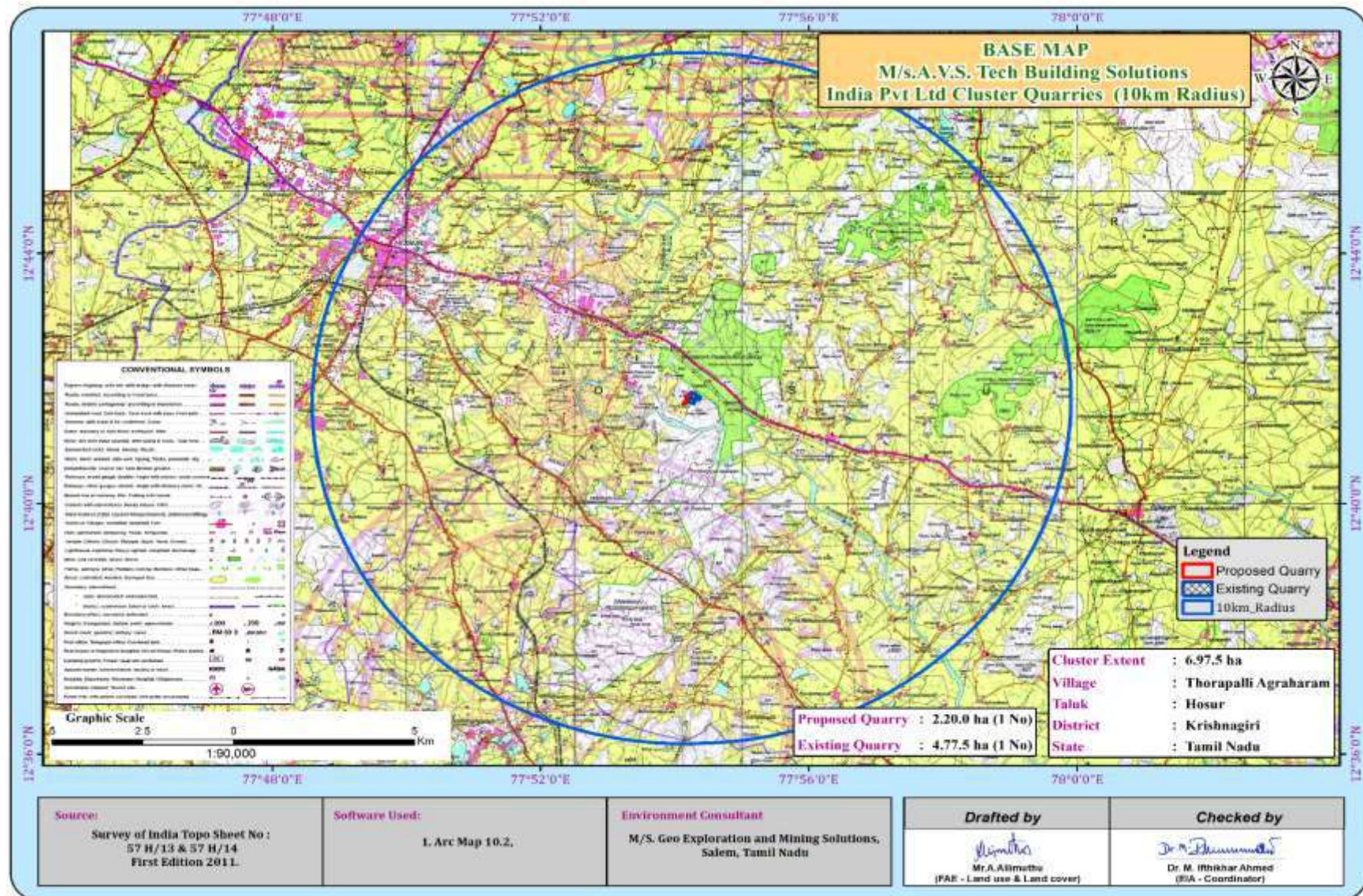
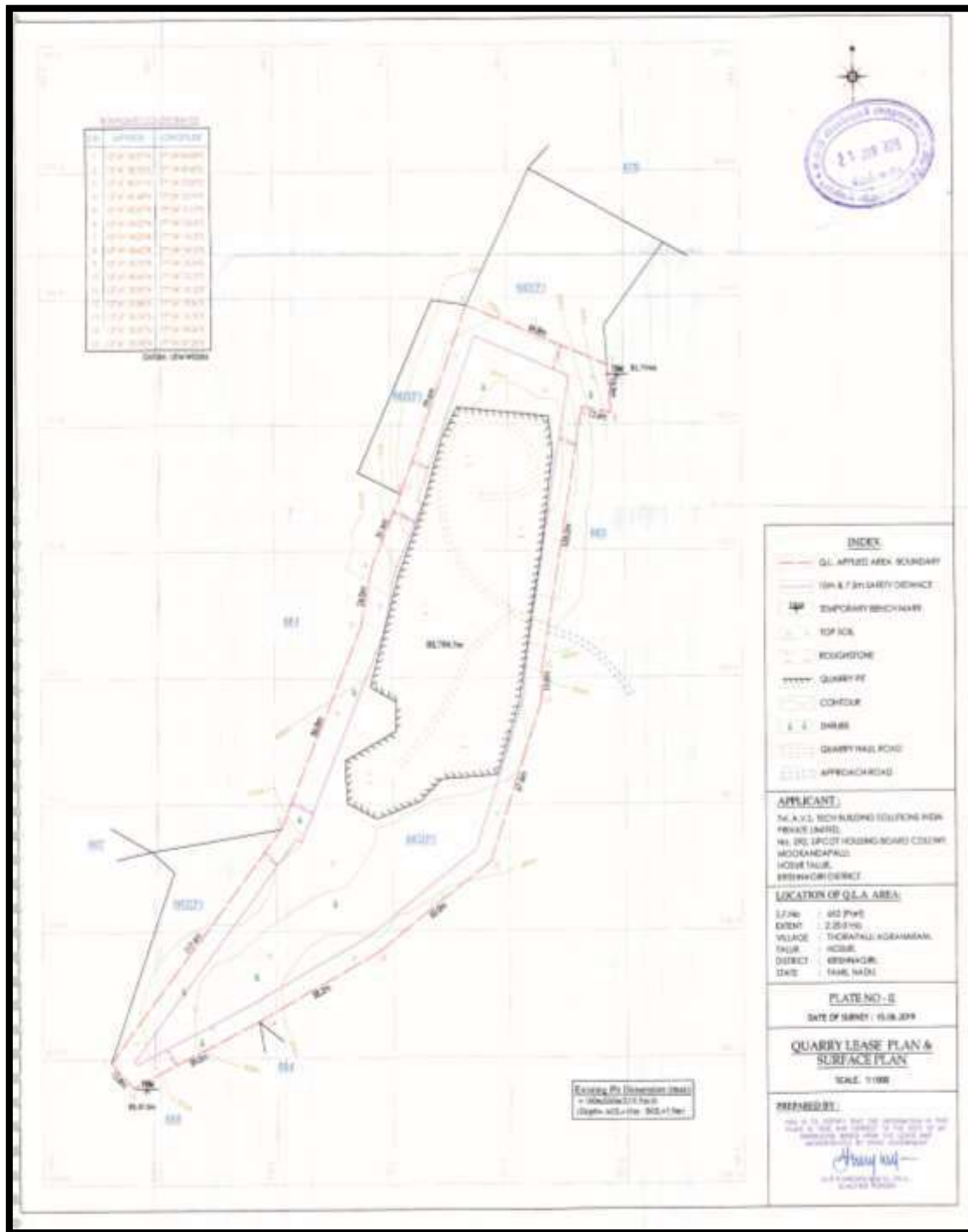


FIGURE – 4: QUARRY LEASE PLAN & SURFACE PLAN



2.4 METHOD OF MINING

Opencast Mechanized Mining Method is being proposed 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 Topsoil will be Excavate directly by Hydraulic Excavators and preserved all along the safety barrier to facilitate greenbelt development during Mine Closure Stage. 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

PROPOSAL – P1				
S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	8	1.2m to 2.0m	Compressed air
2	Compressor	2	400psi	Diesel Drive
3	Excavator with Bucket / Rock Breaker	2	300 HP	Diesel Drive
4	Tippers	3	20 Tonnes	Diesel Drive

2.6 CONCEPTUAL MINING PLAN/ FINAL MINE CLOSURE PLAN

The ultimate pit size is designed based on certain practical parameters such as economical depth of mining, safety zones, permissible area, etc.,

2.7 ULTIMATE PIT DIMENSION

Pit	Length (Max) (m)	Width (Max) (m)	Depth (Max) (m)
I	186	62	51 m (16m AGL+ 35 m BGL)
II	156	40	

3.0 DESCRIPTION OF THE ENVIRONMENT

The baseline status of the project environment is described section wise for better understanding of the broad-spectrum conditions. The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socio-economic status of the study area. Field monitoring studies to evaluate the base line status of the project site were carried out covering Mar– May 2022 as per CPCB & MoEF & CC guidelines.

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's 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	PM ₁₀ PM _{2.5} SO ₂ NO _x Fugitive Dust	24 hourly twice a week (Oct – Dec 2022)	8 (1 core & 7 buffer)	IS 5182 Part 1-23 National Ambient Air Quality Standards, CPCB
*Noise Levels	Ambient Noise	Hourly observation for 24 Hours per location	8 (1 core & 7 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

To study the land use pattern of the core as well as a buffer zone, land use/land cover details have been identified/ maps have been prepared in accordance with the Standard ToR point. A visual interpretation technique has been adopted for land use supervised classification based on training site by Level III classification with 1:50,000 scale for the preparation of land use mapping. Land use pattern of the area was studied through **LISSIII, Bhuvan, NRSC**. The 10 km radius map of study area was taken for analysis of **Land use/Landcover**.

TABLE 3.1: LAND USE / LAND COVER TABLE 10 KM RADIUS

S.No	CLASSIFICATION	AREA_HA	AREA_%
BUILTUP			
1	URBAN	1446.92	4.40
2	RURAL	345.32	1.05
3	MINING	625.59	1.90
AGRICULTURAL LAND			
4	CROP LAND	19090.76	57.99
5	PLANTATION	2388.75	7.26
6	FALLOW LAND	3190.10	9.69
FOREST			
7	EVERGREEN/FOREST EVERGREEN	1704.93	5.18
8	SCRUB FOREST	302.61	0.92
BARREN/WASTE LANDS			
9	SALT AFFECTED LAND	197.13	0.60
10	SCRUB LAND	2064.23	6.27
11	BARREN ROCKY	530.04	1.61
WETLANDS/ WATER BODIES			
12	WATER BODIES/LAKE	1033.64	3.14
TOTAL		32920.02	100.00

LU/LC Interpretation:

- ☞ Thorapalli village Rough stone quarry has proposed Project. It is a government poramboke land.
- ☞ Total project area is 32920.02 ha around 10km radius.
- ☞ As Existing quarry is coming in the area, percentage of human settlement will be increased in surrounding of project site and Infrastructure facilities also will be developed on the basis of requirement.
- ☞ The 10 km radius study area mainly comprises of crop land & Agriculture Plantation land accounting of 57.99% & 7.26% of the total study area. The study area also consists of fallow land of 9.69%.
- ☞ The buffer zone studied has no ecological sensitive area (National Park, Wildlife Sanctuary, Biosphere Reserve/ etc.).
- ☞ Water Bodies such as ponds/ lakes comprises of 3.14% of the total buffer area. The seasonal rivers such as Kuttai 420m-NW, Ponnaiyar river at 620m in South direction, Trippalam Tank 3.8km in NW of the total study area.
- ☞ The Scrub land accounts of 0.92%. As per the primary survey, it was observed the scrub land is mainly occupied by the stony waste and left-over domestic waste generated by the nearby areas.
- ☞ The R.F area (Sanamav R.F), Perandapalli Forest, Sanamavu Forest, Udedurgam R.F area covered is about 5.18% in buffer zone, Scrub Forest is about 0.92% in the study area.
- ☞ 2% of the total study area is occupied by the mine industries of captive mines. The area occupied by Mainly Roughstone of the total buffer area. As also observed within the primary survey, the 10 km buffer area is also occupied by the medium scaled granite and small Brick kiln industries also located in the study area.
- ☞ 5.45% of the area is covered under the Builtup Land. The nearest village within the 3 km radius from the project site boundary is observed to be villages Perandapalli, Bukkasagarm, Kadirapalli etc.,

3.3 SOIL ENVIRONMENT

The samples were analysed as per the standard methods prescribed in “Soil Chemical Analysis (M.L. Jackson, 1967) & Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India”. The important properties analysed

for soil are bulk density, porosity, infiltration rate, pH and Organic matter, kjeldahi Nitrogen, Phosphorous and Potassium

Physical Characteristics –

The physical properties of the soil samples were examined for texture, bulk density, porosity and water holding capacity. The soil texture found in the study area is Clay to Sandy Soil and Bulk Density of Soils in the study area varied between 1.05– 1.22 g/cc. The Water Holding Capacity (35.6-44.8) and Porosity of the soil samples is found to be medium i.e., ranging from 25.0 – 30.8%.

Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline in nature with pH range 7.57 to 8.15
- The available Nitrogen content range between 110 to 185 mg/kg
- The available Phosphorus content range between 0.87 to 1.45 mg/kg
- The available Potassium range between 38.5 to 41.8mg/kg

Whereas, the micronutrient as zinc (Zn), iron (Fe) and copper (Cu) were found in the range of Zinc 0.25 to 1.32mg/kg; Iron 1.10 to 2.13 mg/kg and Copper is BDL (DL:0.05)

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

The pH of surface 7.25-7.52 while turbidity found within the standards. Total Dissolved Solids 446-504mg/l and Chloride 86.2-104.8 mg/l. Nitrates 7.5-9.2mg/l, while sulphates 19.3-28.4 mg/l.

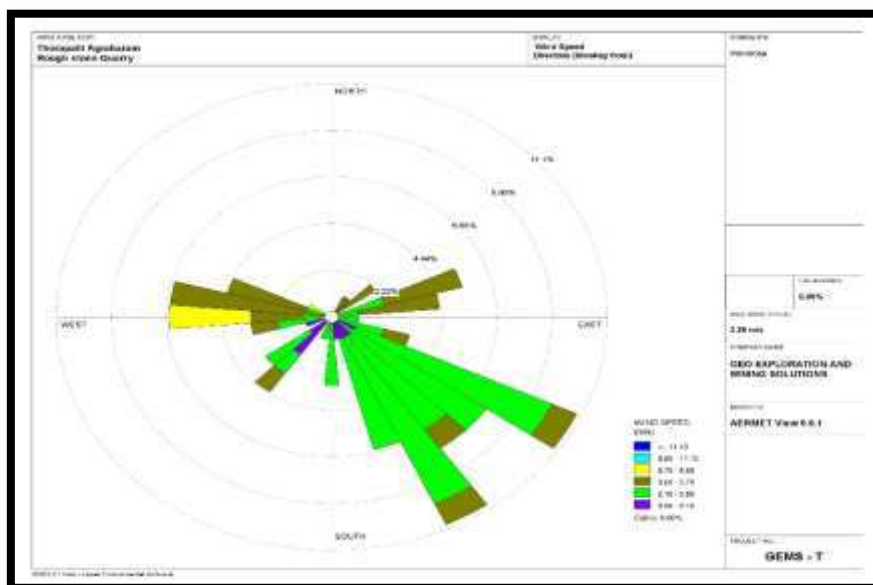
Ground Water

The pH of the water samples collected ranged from 6.91 to 7.85 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 387 – 513mg/l in all samples. The Total hardness varied between 132 – 161 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.

FIGURE – 6: WIND ROSE DIAGRAM

3.6 SUMMARY OF AMBIENT AIR QUALITY

As per monitoring data, PM_{10} ranges from $42\mu\text{g}/\text{m}^3$ to $45.3\mu\text{g}/\text{m}^3$, $PM_{2.5}$ data ranges from $21\mu\text{g}/\text{m}^3$ to $23.5\mu\text{g}/\text{m}^3$, SO_2 ranges from $7.0\mu\text{g}/\text{m}^3$ to $9.0\mu\text{g}/\text{m}^3$ and NO_2 data ranges from $18.1\mu\text{g}/\text{m}^3$ to $22.6\mu\text{g}/\text{m}^3$. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB. The minimum & maximum concentrations of PM_{10} were found to be 42.0 in Project area, Gangapuram, Thorapalli Agraharam & $45.3\mu\text{g}/\text{m}^3$ in Project area. The minimum & maximum concentrations of $PM_{2.5}$ were found to be $21.0\mu\text{g}/\text{m}^3$ in Project area, Perandapalli, Bukkasagaram & $23.5\mu\text{g}/\text{m}^3$ in Project area. The maximum concentration in the core zone is due to the cluster of quarries situated within 500m radius.

3.7 NOISE ENVIRONMENT

Ambient noise levels were measured at 8 (eight) locations around the project area considering cluster quarries. Noise levels recorded in core zone during day time were from 50.8 dB (A) Leq and during night time were from 43.9 (A) Leq. Noise levels recorded in buffer zone during day time were from 49.2 – 50.6 dB (A) Leq and during night time were from 40.1– 43.4 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 57.8 dB(A) in Bukkasagaram Village and 34.9 dB(A) in Tippalam village and 50.5dB(A) in Project area & 33.1 dB(A) in Gangapuram and Agaram Village respectively in night time. Thus, the noise level for Industrial and Residential area meets the requirements of CPCB.

3.8 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.

3.9 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 32 persons to the local people there by improving the indirect employment opportunity for 60 persons and 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

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 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

4.4 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 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
- 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 months once to assess effectiveness of mitigation measures proposed.

4.5 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.

4.6 BIOLOGICAL ENVIRONMENT

ANTICIPATED IMPACT

The developmental programs, policies, and projects operated or managed by government or private bodies can cause potentially significant changes in the physical, biological, and socio-economic environment. In some cases, the changes may be beneficial while in others it may be detrimental to the environment. Accordingly, environmental impact studies are required for systematic identification, qualification, and interpretation of the anticipated changes. The main environmental problems associated with mining activities are deforestation, land degradation (change

in topography, soil erosion), visual intrusion, disturbance to the hydrological system, and water, air, and noise pollution which ultimately impact upon the floral and faunal status of the project area.

MITIGATION MEASURES

Greenbelt means the planting of special types of plants suitable to that particular agroclimatic zone and soil characteristics in a place that will make the area cooler, reduce air pollution, prevent soil erosion, and further improve the soil fertility status. A green belt around the periphery of the boundary and roadside will be created to avoid erosion of soil, prevention of landslides, and minimize air pollution and noise pollution in the project area. Green plants are capable of absorbing air pollutants and forming sinks for pollutants. Leaves with their vast area in a tree crown, absorb pollutants on their surface, effectively reducing their concentration and noise level in the ambient.

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.

GREENBELT DEVELOPMENT PLAN

PROPOSAL FOR P1 – Thiru. N. Narayanan				
Year	No. of trees proposed to be planted	Survival %	Area to be planted	Name of the species
I	It is proposed to plant 1300 Nos of trees in the 1 st year	80%	Safety barrier, Unutilized areas and nearby village roads	Neem, Pongamia pinnata, Casuarina, etc

4.7 SOCIO ECONOMIC ENVIRONMENT

Anticipated Impacts:

- ♣ No. of people will get employment during the construction stage resulting in the ancillary development and growth. Nearby Local people will be given preference for employment on the basis of their skill and experience.
- ♣ Further due to proposed project, influx of working community will also generate an indirect employment through development of nearby market/ shops, trade centers, activities, transportation etc.
- ♣ Population influx during the construction phase can introduce various water and vector borne diseases which can lead to various unhygienic health problems in the area by disturbing the existing sanitation infrastructure.
- ♣ Rapid diverse population influx at the project site can create unusual behavioural activity such as worker-community conflicts, increase violence such as theft/stabbing, and increased consumption of drugs/alcohol within the area.

♣ Impacts on the health of nearby villagers can be envisaged due to the transportation activities leading to short term exposure of fugitive dust, resulting in various acute diseases such as increased eye irritation, nausea, headache etc.

Mitigation measures:

♣ Deploying of mobile toilets or the construction of temporary toilets will be done near to the construction site with the adequate water supply.

♣ Awareness programme will be conducted before the monsoon season regarding the spread of water borne/ vector diseases.

♣ Mosquito repellents will be provided in the nearby villages and at construction site to avoid the spread of diseases.

♣ To overcome behavioral impact, proper site in charge with timely supervision will be done. In advance, facilities with equipped medical and safety services will be provided to take a control over the incident/violence if any caused.

♣ To overcome behavioural impact, supervision will be done by site in charge. In advance, emergency cell will be formed with fully equipped communication system, medical and safety services to take control over the incident/violence caused.

Operation Phase:

Anticipated Impacts:

♣ Long term exposure to the pollutants such as PM, SO₂ and NO₂ Cement dust have a potential to create health impacts such as risk of cardiovascular and respiratory disease, eye irritation, bronchitis, lung damage, increased heart ailments, etc.

♣ Other impacts, associated with the applied for Rough Stone quarry Project will create a positive impact as it will result in the overall development of the area in respect to the infrastructure development, educational growth, health facilities etc., as a part of the CSR activity.

Mitigation Measures:

♣ In order to mitigate the long-term health impacts, efficient Air Pollution Control Equipment (APCE) like Bag House / Bag Filter / ESP will be installed at all major stacks to keep the emissions within the permissible limits. To reduce the gaseous emission, Pyro-process itself acts as a long SO₂ scrubber and De - NO_x system will be installed for fuel burning along with calciner for low NO_x formation. To reduce fugitive emission from vehicles and machineries will be regularly monitored and maintained.

♣ For emergency, proposed to develop an occupational health centre for its employees and nearby villagers.

1.6.3 Impact Evaluation:

Table 4.6.3 Impact Evaluation *Impact evaluation is given in table below.*

Impact Evaluation Element	Impact on socio economics due to the applied for Thorapalli Agraharam Village, Rough Stone quarry cluster quarry over an extent of 6.97.5ha of Poramboke land of Thorapalli Agraharam Village, Hosur Taluk, Krishnagiri District, Tamil Nadu State.			
Potential Effect/ Concern	Proposed Existing project will provide direct & indirect employment opportunities to the local residents, which will help to increase their earning and better living standard as well as further up-liftment of socio-economic status of the area.			
Characteristics of Impacts				
Nature	Positive		Negative	Neutral
	✓			
Type	Direct	Indirect	Cumulative	
			✓	
Extent	Project area	Local	Zonal	Regional
		✓		
Duration	Short time		Long term	
			✓	
Intensity	Low		Medium	High
			✓	
Frequency	Remote (R)	Occasional (O)	Periodic (P)	Continuous (C)
			✓	
Significance of Impact				
Significance	Insignificant	Minor	Moderate	Major
			✓	

5. ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

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

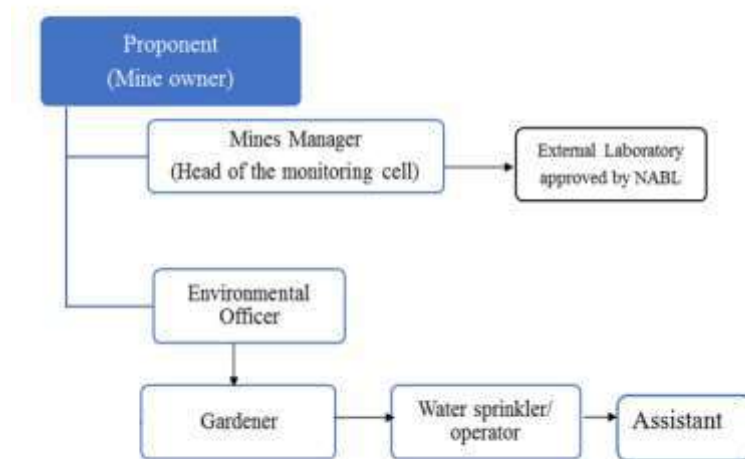
6. ENVIRONMENT MONITORING PROGRAM

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 (1SW & 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 for proposed project. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

7.2 DISASTER MANAGEMENT PLAN

Natural disasters like Earthquake, Landslides have not been recorded in the past history as the terrain is categorized under seismic zone III. The area is far away from the sea hence the disaster due to heavy floods and tsunamis are not anticipated.

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	Production for five-year plan period m ³	Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load Per Day @ 6m ³ per load
P1	3,04,455	60,891	203	34 Trips /Day
Total	3,04,455	60,891	203	34 Trips /Day

CUMULATIVE PRODUCTION LOAD OF TOP SOIL

Quarry	Mineable Reserves in m ³	*Per Year Production in m ³	Per Day Production in m ³	Number of Lorry Load @ 6m ³ per load
P1	7,344	3,672	12	2Trips /Day
Total	7,344	3,672	12	2Trips /Day

PREDICTED NOISE INCREMENTAL VALUES FROM QUARRY

Location ID	N1	N2	N3	N4	N5	N6	N7	N8
Maximum Monitored Value (Day) dB(A)	56.1	56.7	57.8	57.1	57.6	57.1	57.1	57.1
Incremental Value dB(A)	46.12	32.50	27.04	31.16	29.73	30.56	23.84	46.12
Total Predicted Noise level dB(A)	56.52	56.72	57.80	57.11	57.61	57.11	57.10	57.12
NAAQ Standards	Industrial Residential		Day Time- 75 dB (A)		Night Time- 70 dB (A)		Night Time- 45 dB (A)	

SOCIO ECONOMIC BENEFITS

Location Code	Employment	Project Cost	CER Cost
P1	32	Rs.1,65,23,000	Rs.5,00,000/-

A total of 32 people will get employment due to mines in cluster and already employed.

Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III, Dated: 01.05.2018 by all the mines.

8. PROJECT BENEFITS

The Proposed Project for Rough Stone quarry at Thorapalli Agraharam Village aims to produce about **3,04,455m³** Rough Stone quarry over period of 5Years & **7,344 m³** of Topsoil over a period of 2 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

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

Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan was prepared and fund has been allocated for the same. The EMP is dynamic, flexible and subjected to periodic review. For project where the major environmental impacts are associated, EMP will be under regular review. Senior Management responsible for the project will conduct a review of EMP and its implementation to ensure that the EMP remains effective and appropriate. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.