

# EXECUTIVE SUMMARY

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

**CLUSTER EXTENT = 9.94.85 ha**

**DHARAVENDIRAM ROUGH STONE QUARRY**

**At**

Dharavendiram Village, Denkanikottai Taluk, Krishnagiri District

ToR obtained vide

Lr No. SEIAA-TN/F.No.8691/SEAC/TOR-1046/2022 Dated: 31.01.2022

Name and Address of the proponent	Project site Details	Project Details
M/s. AVS Tech Building Solutions, Proprietor S. Srinivasan, No. 112/B, ESI Back Side, Mookondapalli, Hosur Taluk, Krishnagiri District, Tamil Nadu State - 635 126.	S.F.No 315/1 (P), 334/1A (P) 334/1B (P), Extent : 4.35.85 Ha Dharavendiram Village, Denkanikottai Taluk, Krishnagiri District	Proposed Production 4,87,120 m <sup>3</sup> of Rough stone Depth 16m, Project Cost Rs. 1,41,66,000/- CER Cost: Rs. 5,00,000/-

## Environmental Consultant



## GEO EXPLORATION AND MINING SOLUTIONS



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ENVIRONMENTAL LAB

**CHENNAI METTEX LAB PRIVATE LIMITED**

**Baseline Monitoring Season – March to May 2022**

**NOVEMBER 2022**

## 1.0 INTRODUCTION

Rough Stone is the major requirements for construction industry. This EIA report is prepared by considering Cumulative load of all proposed & existing quarries of Panchakshipuram Rough Stone Quarries Cluster consisting of One Proposed and Two Existing Quarries with total extent of Cluster of 9.94.85 ha in Dharavendiram Village, Denkanikottai Taluk, Krishnagiri District and Tamil Nadu State, cluster area calculated as per MoEF & CC Notification S.O. 2269(E) Dated 1st July 2016.

This EIA Report is prepared in compliance with ToR obtained vide –

✚ Lr No. SEIAA-TN/F.No.8707/SEAC/TOR-1070/2022 Dated: 01.03.2022;

The Baseline Monitoring study has been carried out during the period of March – May 2022 and this EIA and 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) individually to minimize those adverse impacts.

**“Draft EIA report prepared on the basis of ToR Issued & Standard ToR 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	M/s. AVS Tech Building Solutions Rough Stone Quarry
S.F. No.	315/1 (P), 334/1A (P), 334/1B (P)
Extent	4.35.85 ha
Land Type	Patta Land
Village Taluk and District	Dharavendiram Village, Denkanikottai Taluk, Krishnagiri District

### 1.2 QUARRY DETAILS WITHIN 500 M RADIUS

PROPOSED QUARRIES				
CODE	Name of the Owner	S.F. Nos	Extent	Status
<b>P1</b>	M/s. AVS Tech Building Solutions, Proprietor S. Srinivasan, No. 112/B, ESI Back Side, Mookondapalli, Hosur Taluk, Krishnagiri District, Tamil Nadu State – 635 126.	315/1 (P), 334/1A (P) and 334/1B (P)	4.35.85	Received for TOR Vide <b>Lr No. SEIAA- TN/F.No.8707/SEAC/TOR- 1070/2022 Dated: 01.03.2022.</b>
EXISTING QUARRIES				
<b>E1</b>	Thiru. K.M.Gopaliah, S/o. Late Munisamy, Door No.18/A, Karupala Village, Semparasanapalli Post, Shoolagiri, Hosur, Krishnagiri District – 635 117.	316 (P-2)	2.70.00	25.01.2019 to 24.01.2024
<b>E2</b>	M/s. AVS Tech Building Solutions, Thiru. S. Srinivasan, No.112/1B, Mookandapalli, ESIC Back Side, Hosur Taluk, Krishnagiri District – 635 126.	316 (Part-1)	2.89.00	24.08.2016 to 23.08.2026
ABANDONED / OLD QUARRIES				
<b>A1</b>	Thiru. S. Sundraiah, Late. S/o. Subramanian, No.2/89A-1, Addraganapalli Village, Shoolagiri Tk, Krishnagiri Dt.	319/2B, 2C, 2D	0.85.00	20.03.2015 to 19.03.2020
<b>TOTAL CLUSTER EXTENT</b>			<b>9.94.85 ha</b>	

Note: -

- **Cluster area is calculated as per MoEF & CC Notification – S.O. 2269 (E) Dated: 01.07.2016**

### 1.3 SALIENT FEATURES OF THE PROPOSAL

Name of the Quarry	M/s. AVS Tech Building Solutions, Rough Stone Quarry	
Toposheet No	57-H/10	
Latitude between	12°33'34.45"N to 12°33'44.96"N	
Longitude between	77°40'47.64"E to 77°40'55.77"E	
Highest Elevation	935 m AMSL	
Proposed Depth of Mining	16m	
Geological Resources	Rough Stone in m <sup>3</sup>	Topsoil m <sup>3</sup>
	17,43,400	43,585
Mineable Reserves	Rough Stone in m <sup>3</sup>	Topsoil m <sup>3</sup>
	9,50,820	37,626
Production as per the depth recommended in ToR	Rough Stone in m <sup>3</sup>	Topsoil m <sup>3</sup>
	4,87,120 m <sup>3</sup>	37,626
Existing Pit Dimension	-	
Ultimate Pit Dimension	273m (L) * 186m (W) * 41m (D)	
Water Level in the surrounding area	67-62m bgl	
Method of Mining	Opencast Mechanized Mining Method involving drilling and blasting	
Topography	The lease area is a plain terrain. The area has gentle slope towards Southern side. The altitude of the area is 935m (max) above mean sea level.	
Machinery proposal for this scheme period	Jack Hammer	6 Nos
	Compressor	2 Nos
	Wagon Drill	1 No
	Excavator with Bucket & Rock Breaker	2 Nos
	Tipplers	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	
Total Project Cost	Rs.1,34,06,000/-	
Proposed CER Cost	Rs.5,00,000/-	
Nearby Water Bodies	Soman Eri	530m South
	Tank Near Hosapuram	630m North
	Tank Near Kothanur	1.2km NE
	Sarandapalli Vannamma Lake	1.6km SE
	Thally Lake	3.2km NW
	Thoragari Agraharam Lake	6.0km NE
Greenbelt Development Plan	Proposed to plant about 1,500 Nos of trees in the safety barrier and village roads considering 500 Nos of Trees per hectare.	
Proposed Water Requirement	3.5 KLD	
Nearest Habitation	670m South East	

Source: Approved Mining Plan

### 1.4 STATUTORY DETAILS

#### SCREENING –

- The project proponent applied for Rough Stone Quarry Lease Dated: 27.11.2020.
- Precise Area Communication Letter was issued by the District Collector of Krishnagiri Vide Rc.No.1157/2020/Mines dated 25.02.2021.
- Mining Plan approved by Assistant Director, Krishnagiri Roc.No. 1157/2020/Mines Dated: 29.04.2021.
- 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/64328/2021, Date: 30.06.2021

### SCOPING –

- The proposal was placed in 245<sup>th</sup> SEAC meeting held on 11.02.2022 and the committee recommended for issue of ToR.
- The proposal was considered in 488<sup>th</sup> SEIAA meeting held on 28.02.2022 and issued ToR vide Letter No SEIAA-TN/F.No.8707/SEAC/ToR-1070/2022 Dated 01.03.2022.

## 2.0 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 quarry.

Method of mining is common for the proposed quarry in the cluster. 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

<b>Nearest Roadway</b>	Nearest National Highway (NH-7) Kanniyakumari – Bengaluru – 25km - NE State Highway (SH-17B) Thally – Hosur – 3.0Km Northwest
<b>Nearest Village</b>	Dharavendiram –1.0Km - SE
<b>Nearest Town</b>	Denkanikottai – 12.0Km- SE
<b>Nearest Railway Station</b>	Hosur Railway station - 25.0Kms -NE
<b>Nearest Airport</b>	Bengaluru Airport - 47.0Kms- NW
<b>Seaport</b>	Chennai - 287km – Northeast

### 2.2 LAND USE PATTERN OF THE LEASE AREA

DESCRIPTION	PRESENT AREA IN (HA)	AREA AT THE END OF LIFE OF QUARRY (HA)
Area under quarry	Nil	3.57.55
Infrastructure	Nil	0.01.00
Roads	Nil	0.02.00
Green Belt	Nil	0.30.00
Un – utilized area	4.35.85	0.45.30
<b>TOTAL</b>	<b>4.35.85</b>	<b>4.35.85</b>

Source: Approved Mining Plans

### 2.3 OPERATIONAL DETAILS OF LEASE AREA

PARTICULARS	DETAILS	
	Rough Stone	Topsoil
Geological Resources in m <sup>3</sup>	17,43,400	43,585
Mineable Reserves in m <sup>3</sup>	9,50,820	37,626
<b>Proposed production as per depth recommended in ToR</b>	<b>4,87,120</b>	<b>37,626</b>
Yearwise Production for five years in m <sup>3</sup>	4,87,120	37,626
Mining plan period	10 Years	-
Number of Working Days	300 Days	300 Days
Production per day in m <sup>3</sup>	<b>325</b>	<b>42</b>
No of Lorry loads (12m <sup>3</sup> per load)	<b>27</b>	<b>4</b>
Total Depth of Mining	16m	

Source: Approved Mining Plan and as per recommendations given in TOR letter (Point-1).

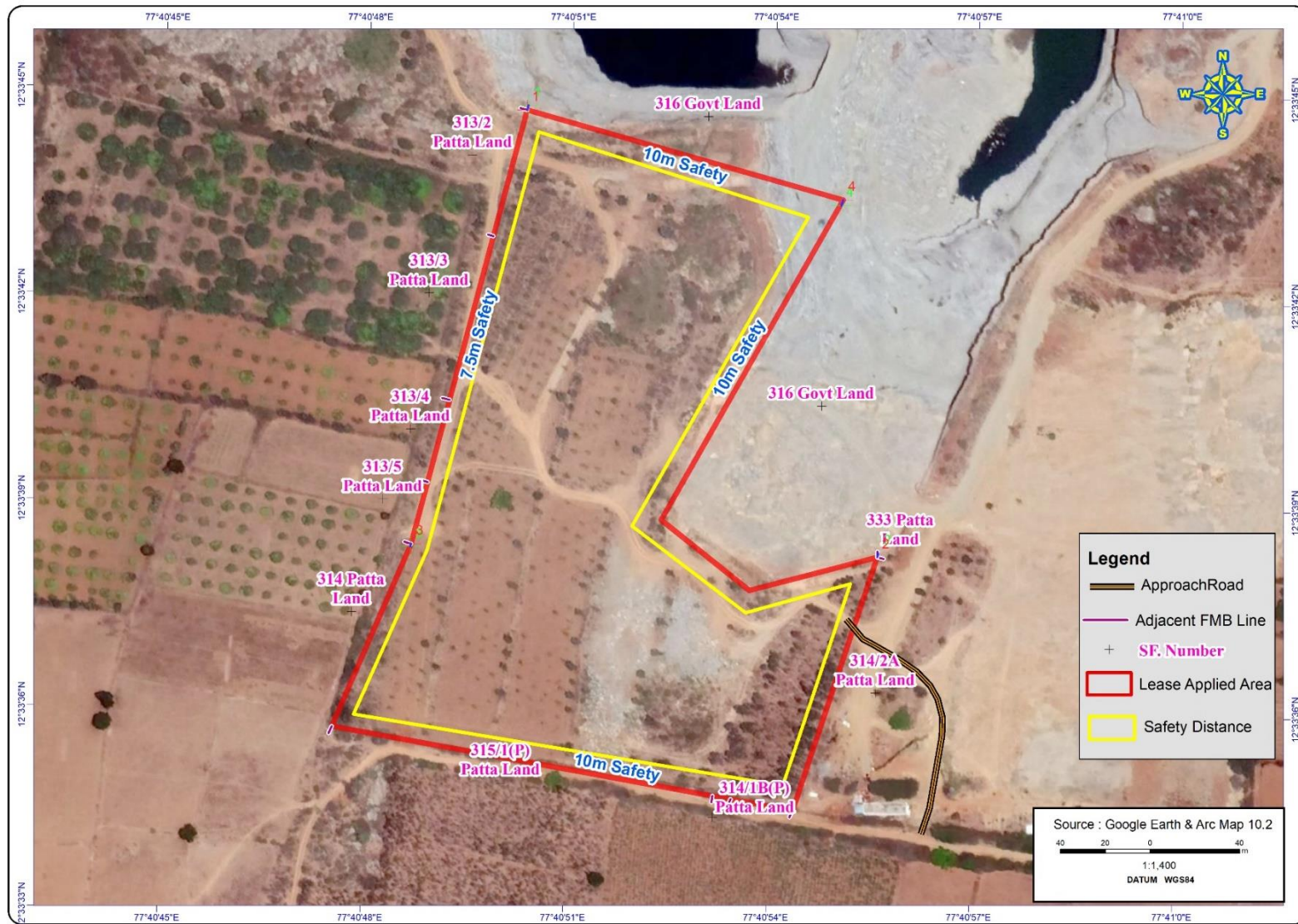
## 2.4 YEAR-WISE PRODUCTION PLAN

Year wise Reserves								
Section	Year	Bench	Length in (m)	Width in (m)	Depth in (m)	Recoverable Reserve of Rough stone in(m <sup>3</sup> )100%	Topsoil (m <sup>3</sup> )	
XY-AB	I	I	159	104	1	-	16536	
		II	157	101	5	79285	-	
		III	40	91	5	18200	-	
	<b>Total</b>					<b>97485</b>	<b>16536</b>	
XY-CD	II	III	35	130	5	50960	-	
		I	70	51	3	-	9805	
	III	II	65	97	5	47320	-	
		<b>Total</b>					<b>98280</b>	<b>9805</b>
		I	60	134	5	-	11285	
	IV	II	15	120	5	55510	-	
		III				43000	-	
		<b>Total</b>					<b>98510</b>	<b>11285</b>
	V	III	20	120	5	49880	-	
		IV	54	57	5	48600	-	
<b>Total</b>					<b>98480</b>	<b>-</b>		
XY-AB	IV	IV	35	110	4	34830	-	
		IV	55	124	4	59535	-	
<b>Total</b>					<b>94365</b>	<b>-</b>		
<b>Grand Total</b>						<b>487120</b>	<b>37626</b>	

Source: Approved Mining Plan

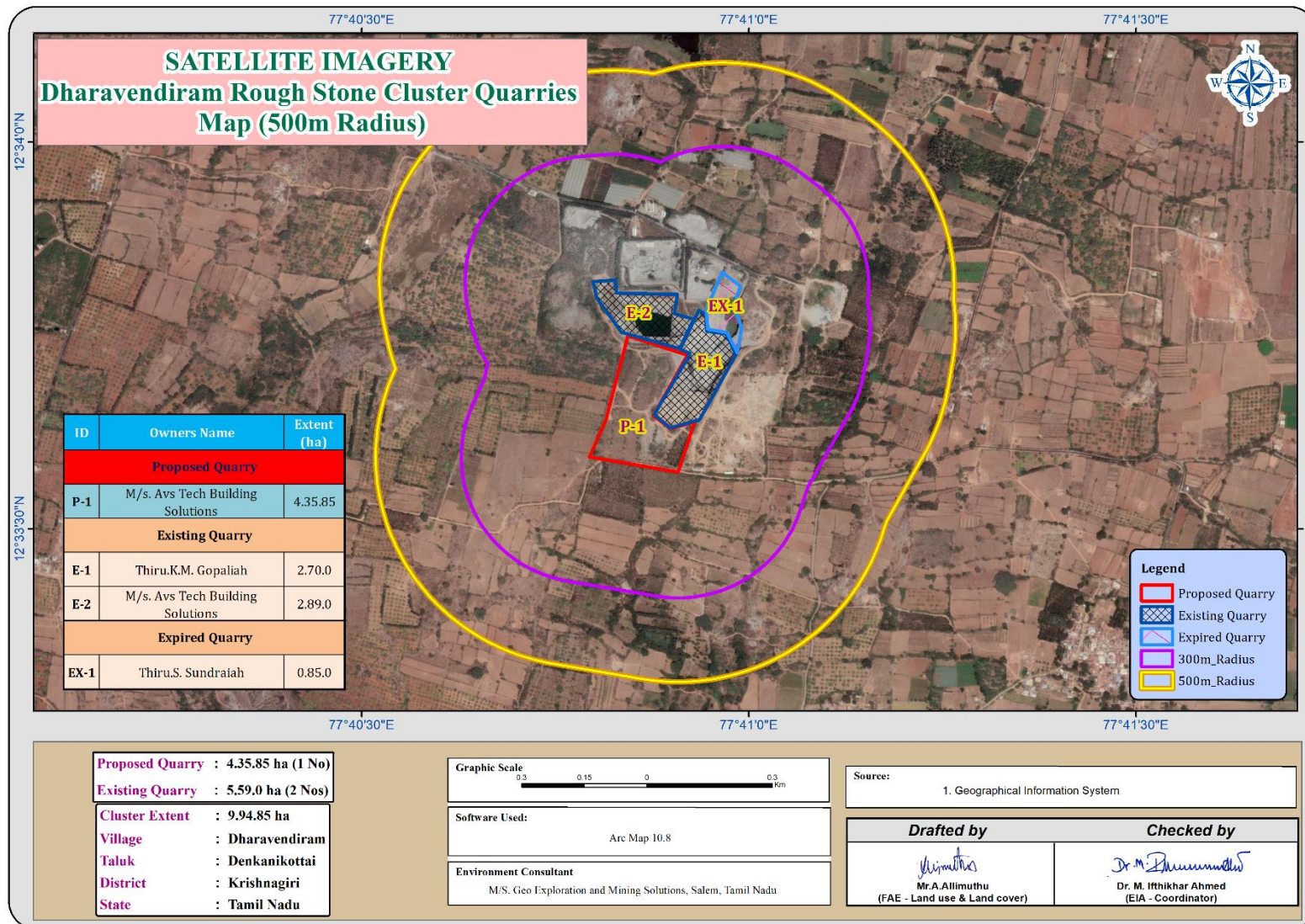


**FIGURE – 1: GOOGLE IMAGE SHOWING LEASE AREA**



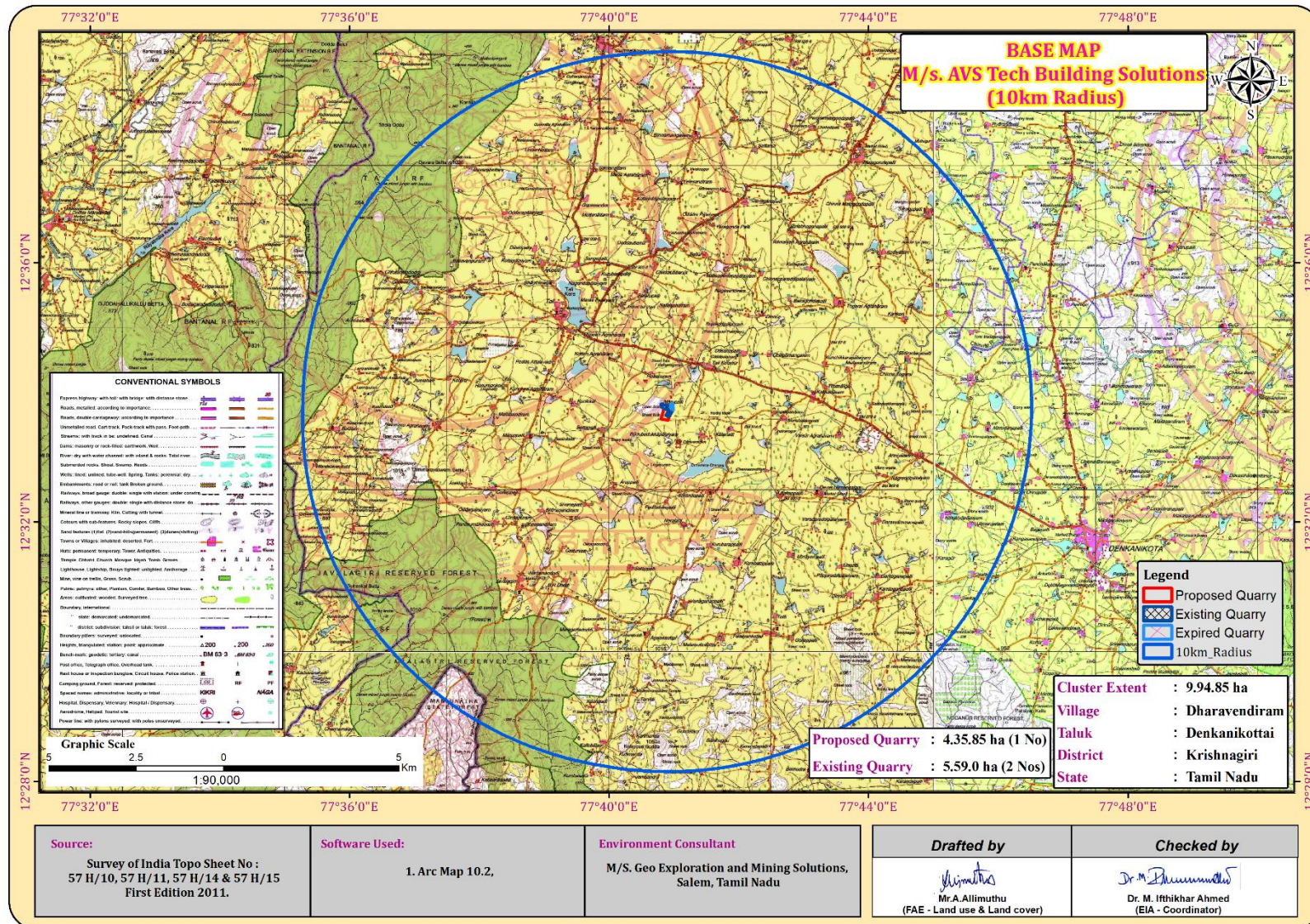


**FIGURE – 2: GOOGLE IMAGE SHOWING CLUSTER QUARRIES**





**FIGURE – 3: TOPOSHEET MAP COVERING 10 KM RADIUS**



## 2.5 METHOD OF MINING

- The method of mining is 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.

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.

## 2.6 PROPOSED MACHINERY DEPLOYMENT

S.NO.	TYPE	NOS	SIZE/CAPACITY	MOTIVE POWER
1	Jack hammers	6	1.2m to 2.0m	Compressed air
2	Compressor	2	400psi	Diesel Drive
3	Wagon drill	1	60HP	Diesel Drive
4	Excavator with Bucket / Rock Breaker Unit 4	2	300 HP	Diesel Drive
5	Tippers / Dumpers	4	20 Tonnes	Diesel Drive

Source: Approved Mining Plan

## 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 (Max) (m)	Width (Max) (m)	Depth (Max)
I	273	186	41

Source: Approved Mining Plan

## 1. DESCRIPTION OF THE ENVIRONMENT

Field monitoring studies to evaluate the base line status of the project site were carried out during March 2022 to May 2022 as per CPCB guidelines. Environmental Monitoring data has been collected with reference to proposed mine by CHENNAI METTEX LAB PRIVATE LIMITED – Approved by AAI, AGMARK, APEDA, BIS, [IC, FSSAI, GAFTA, IOPEPC, MOEF Et TEA BOARD, for the below attributes.



### 3.1 ENVIRONMENT MONITORING ATTRIBUTES

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

Source: Field Monitoring Data

### 3.2 LAND ENVIRONMENT

From the above table, pie diagram and land use map it is inferred that the majority of the land in the study area is Agriculture land (includes crop, Plantation and fallow land) 87.75% followed by Built up land 5.17%, Forest area – 1.23%. Barren/Waste lands– 3.55% and Wet lands & water bodies 2.31%

The total mining area within the study area is 21.68.0 ha i.e., 0.06%. The cluster area of 9.25.0ha contributes about 42.66% of the total mining area within the study area. This small percentage of Mining Activities shall not have any significant impact on the environment.

S.No	CLASSIFICATION	AREA_HA	AREA_%
	<b>BUILTUP</b>		
1	URBAN	207.67	0.63
2	RURAL	142.17	0.43
3	MINING	31.68	0.10
	<b>AGRICULTURAL LAND</b>		
4	CROP LAND	19205.62	58.32
5	PLANTATION	5475.36	16.63
6	FALLOW LAND	2090.74	6.35
	<b>FOREST</b>		
7	EVERGREEN/SEMI EVERGREEN	1436.74	4.36
8	DECIDUOUS	2406.48	7.31
9	SCRUB FOREST	337.43	1.02
	<b>BARREN/WASTE LANDS</b>		
10	SCRUB LAND	1107.57	3.36
11	BARREN ROCKY	22.71	0.07
	<b>WETLANDS/ WATER BODIES</b>		
12	WATER BODIES/LAKE	464.52	1.41
	<b>TOTAL</b>	<b>32928.70</b>	<b>100.00</b>

### 3.3 SOIL ENVIRONMENT

#### 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 Loam and Bulk Density of Soils in the study area varied between 1.18 – 1.20 g/cc. The Water Holding Capacity and Porosity of the soil samples is found to be medium i.e. ranging from 42.0 – 52.1 %.

#### Chemical Characteristics –

- The nature of soil is slightly alkaline to strongly alkaline with pH range 8.16 to 8.51
- The available Nitrogen content range between 170 to 198 mg/kg
- The available Phosphorus content range between 1.20 to 1.42 mg/kg
- The available Potassium range between 38.4 to 58.6 mg/kg

### 3.4 WATER ENVIRONMENT

#### Surface Water

##### Ph:

The pH is 7.28 to 7.71 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 is 606 to 672 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 108 to 192 mg/l. Nitrates is around 0.86 to 1.85 mg/l, while sulphates content is 40 to 62 mg/l.

#### Ground Water

The pH of the water samples collected ranged from 7.28 to 7.71 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. The Total Dissolved Solids were found in the range of 606 to 672 mg/l in all samples. The Total hardness varied between 216 to 226 mg/l for all samples.

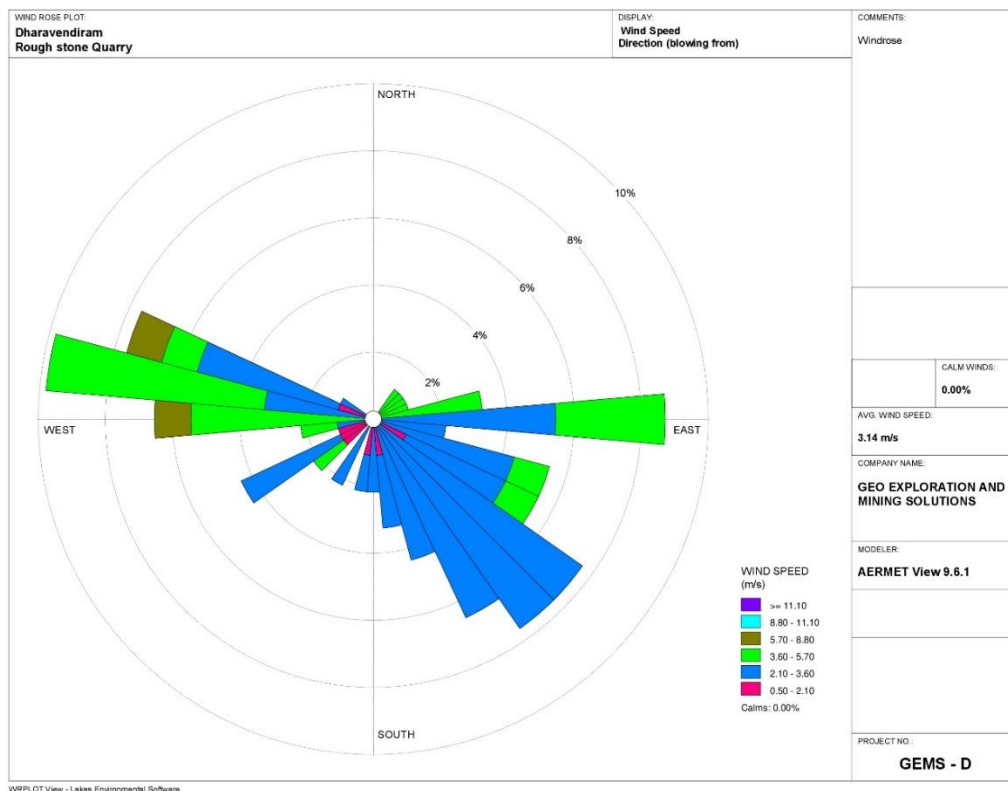
On Microbiological parameters, the water samples from all the locations meet the requirement. The parameters thus analysed were compared with IS 10500:2012 and are well within the prescribed limits.

### 3.5 AIR ENVIRONMENT

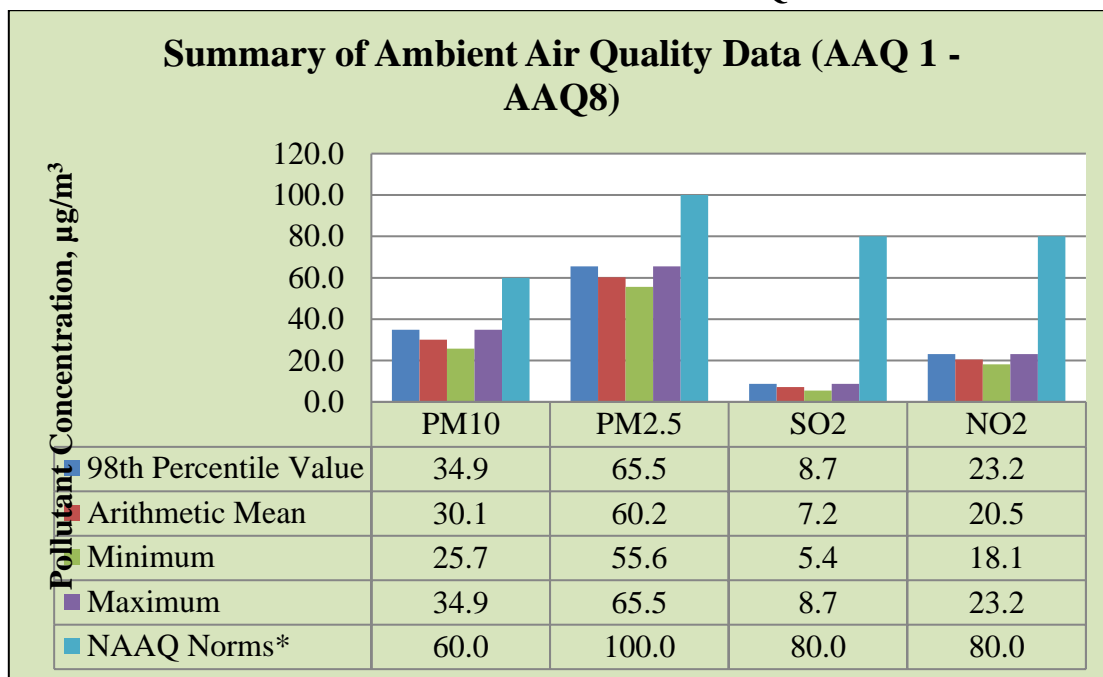
The baseline studies on air environment include identification of specific air pollution parameters and their existing levels in ambient air. The ambient air quality with respect to the study zone of 10 km radius around the proposed quarry forms the baseline information.



**FIGURE – 4: WIND ROSE DIAGRAM**



**FIGURE – 5: SUMMARY OF AMBIENT AIR QUALITY DATA**



The results of ambient air quality monitoring for the period (March 20202 to May 2022) are presented in the report. Data has been compiled for three months.

As per monitoring data, PM<sub>10</sub> ranges from 55.6 µg/m<sup>3</sup> to 65.5 µg/m<sup>3</sup>, PM<sub>2.5</sub> data ranges from 25.7 µg/m<sup>3</sup> to 34.9 µg/m<sup>3</sup>, SO<sub>2</sub> ranges from 5.4 µg/m<sup>3</sup> to 8.7 µg/m<sup>3</sup> and NO<sub>2</sub> data ranges from 18.1 µg/m<sup>3</sup> to 23.2 µg/m<sup>3</sup>. The concentration levels of the above criteria pollutants were observed to be well within the limits of NAAQS prescribed by CPCB.

### **3.6 NOISE ENVIRONMENT**

Ambient noise levels were measured at 8 (Eight) locations around the proposed project area. Noise levels recorded in core zone during day time is 60.3 dB (A) Leq and during night time it is 51.5 dB (A) Leq. Noise levels recorded in buffer zone during day time were from 59.9 to 62.4 dB (A) Leq and during night time were from 49.8 to 53.2 dB (A) Leq.

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

### **3.7 ECOLOGICAL ENVIRONMENT**

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

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

### **3.8 SOCIO ECONOMIC ENVIRONMENT**

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

The socio economic study of surveyed villages gives a clear picture of its population, average household size, literacy rate and sex ratio etc. It is also found that a part of population is suffering from lack of permanent job to run their day to day life. Their expectation is to earn some income for their sustainability on a long-term basis.

The project will aim to provide preferential employment to the local people there by improving the employment opportunity in the area and in turn the social standards will improve.

## **4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES –PROPOSED QUARRY**

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

### **4.1 LAND ENVIRONMENT:**

#### **ANTICIPATED IMPACT**

- Permanent or temporary change on land use and land cover.
- Change in Topography: Topography of the ML area will change at the end of the life of the mine.
- Movement of heavy vehicles sometimes cause problems to agricultural land, human habitations due to dust, noise and it also causes traffic hazards.
- Due to degradation of land by pitting the aesthetic environment of the core zone may be affected.
- Earthworks during the rainy season increase the potential for soil erosion and sediment laden water entering the water ways.

If no due care is taken wash off from the exposed working area may choke the water course & can also causes the siltation of water course.

#### **MITIGATION MEASURES**

- The mining activity will be gradual confined in blocks and excavation will be undertaken progressively along with other mitigative measures like phase wise development of greenbelt etc.
- Construction of garland drains all around the quarry pits and construction of check dam at strategic location in lower elevations to prevent soil erosion due to surface runoff during rainfall and also to collect the storm water for various uses within the proposed area
- Green belt development along the boundary within safety zone. The small quantity of water stored in the mined out pit will be used for greenbelt
- Thick plantation will be carried out on unutilized area, top benches of mined out pits, on safety barrier, etc.,
- At conceptual stage, the land use pattern of the quarry will be changed into Greenbelt area and temporary reservoir
- In terms of aesthetics, natural vegetation surrounding the quarry will be retained (such as in a buffer area i.e., 7.5 m safety barrier and other safety provided) so as to help minimise dust emissions.
- Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

### **4.2 WATER ENVIRONMENT**

#### **ANTICIPATED IMPACT**

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

- The sewage from soak pit may percolate to the ground water table and contaminate it.
- Surface drainage may be affected due to Mining
- Abstraction of water may lead to depletion of water table.

### **MITIGATION MEASURES**

- Garland drains, settling tank will be constructed along the individual mining leases. The Garland drains of the individual leases will be connected to settling tank and after settling the water will be discharged out to the natural drainage
- Rainwater will be collected in sump in the mining pits and will be allowed to store and pumped out to surface setting tank of 15 m x 10m x 3m to remove suspended solids if any. This collected water will be judiciously used for dust suppression onwards and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting
- Providing benches with inner slopes and through a system of drains and channels, allowing rain water to descent into surrounding drains, so as to minimize the effects of erosion & water logging arising out of uncontrolled descent of water.
- Reuse the water collected during storm for dust suppression and greenbelt development within the mines
- Installing interceptor traps/oil separators to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will pass through interceptor traps/oil separators prior to its reuse;
- Using flocculating or coagulating agents to assist in the settling of suspended solids during monsoon seasons;
- Periodic analysis of quarry pit water and ground water quality in nearby villages.
- Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
- De-silting will be carried out before and immediately after the monsoon season.
- Regular monitoring and analysing the quality of water in open well, bore wells and surface water

## **4.3 AIR ENVIRONMENT**

### **ANTICIPATED IMPACT**

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

### **MITIGATION MEASURES**

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

**Advantages of Wet Drilling:** -



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

#### **Blasting –**

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

#### **Haul Road & Transportation –**

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

#### **Green Belt –**

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

#### **Occupational Health –**

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

## **4.4 NOISE ENVIRONMENT**

### **ANTICIPATED IMPACT**

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

### **MITIGATION MEASURES**

- Usage of sharp drill bits while drilling which will help in reducing noise;

- Secondary blasting will be totally avoided and hydraulic rock breaker will be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained;
- The blasting will be carried out during favourable atmospheric condition and less human activity timings by using nonelectrical initiation system;
- Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise;
- Provision of sound insulated chambers for the workers working on machines (HEMM) producing higher levels of noise;
- Silencers / mufflers will be installed in all machineries;
- Green Belt/Plantation will be developed around the project area and along the haul roads. The plantation minimizes propagation of noise;
- Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of HEMM and persons working near HEMM and their use will be ensured through training and awareness.
- Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.

## 4.5 BIOLOGICAL ENVIRONMENT

### ANTICIPATED IMPACT

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

### MITIGATION MEASURES

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

#### 4.5.1 GREENBELT DEVELOPMENT PLAN

PROPOSAL				
Year	No. of trees proposed to be planted	Survival %	Area to be planted	Name of the species
I	It is proposed to plant 2,500 Nos of trees in the 1 <sup>st</sup> year	80%	Safety barrier, Unutilized area's and nearby village roads	Neem, Pungam, Sengondrai, Panai

## 4.6 SOCIO ECONOMIC ENVIRONMENT

### ANTICIPATED IMPACT

Employment generation due to the project will provide direct employment for about 35 persons.

### MITIGATION MEASURES

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

## 5.0 ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

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

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

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

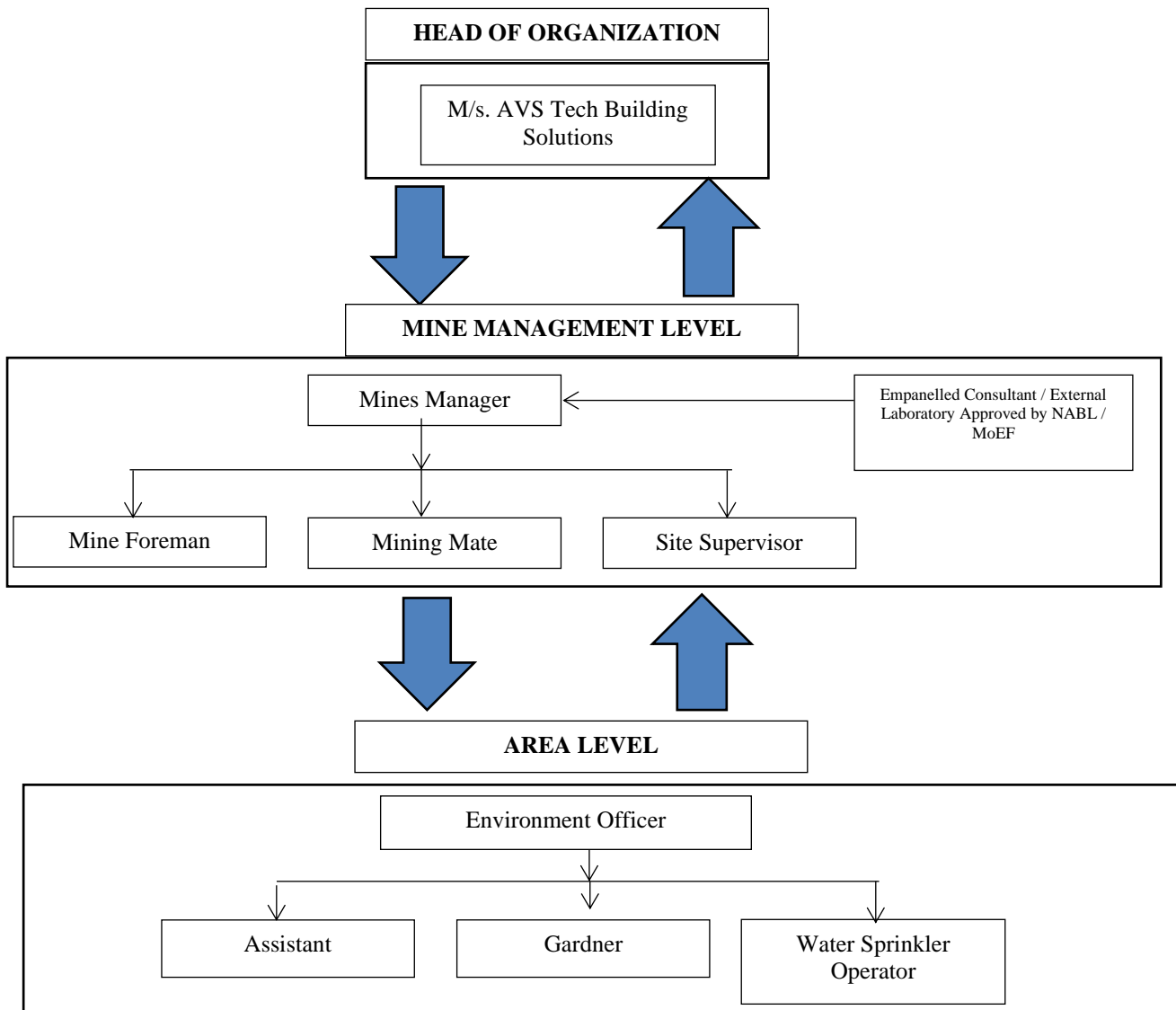
## 6.0 ENVIRONMENT MONITORING PROGRAM

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

The Objective of Monitoring -

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

### 6.1 ENVIRONMENTAL MONITORING CELL





**6.2 POST ENVIRONMENTAL CLEARANCE MONITORING SCHEDULE**

S. No.	Environment Attributes	Location	Monitoring		Parameters
			Duration	Frequency	
1	Air Quality	2 Locations (1 Core & 1 Buffer)	24 hours	Once in 6 months	Fugitive Dust, PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> and NO <sub>x</sub> .
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 31<sup>st</sup> December, 2002. The DGMS risk assessment process is intended to identify existing and probable hazards in the work environment and all operations and assess the risk levels of those hazards in order to prioritize those that need immediate attention. Further, mechanisms responsible for these hazards are identified and their control measures, set to timetable are recorded along with pinpointed responsibilities.

The whole quarry operation will be carried out under the direction of a Qualified Competent Mine Manager holding certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad. Risk Assessment is all about prevention of accidents and to take necessary steps to prevent it from happening.

### 7.2 DISASTER MANAGEMENT PLAN

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities.

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

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

### 7.3 CUMULATIVE IMPACT STUDY

#### CUMULATIVE PRODUCTION LOAD OF ROUGH STONE

Quarry	PROPOSED PRODUCTION DETAILS			
	5 Years in m <sup>3</sup>	Per Year in m <sup>3</sup>	Per Day in m <sup>3</sup>	Number of Lorry Load Per Day @ 12m <sup>3</sup> per load
P1	4,87,120	97,424	325	27
E1	3,17,129	63,426	211	18
E2	4,87,618	1,62,539	542	45
<b>Total</b>	<b>12,91,867</b>	<b>3,23,389</b>	<b>1,078</b>	<b>90</b>

Source: Lab Monitoring Data

#### ANTICIPATED GROUND VIBRATIONS IN CLUSTER

Location Code	Maximum Charge in kgs	Nearest Habitation in m	PPV in m/ms
P1	141	670m – SE	0.788
E1	92	740m – SE	0.478
E2	140	980m – SE	0.426

#### SOCIO ECONOMIC BENEFITS FROM CLUSTER

Location Code	Project Cost	CER
P1	Rs.1,41,66,000	Rs.10,00,000
E1	Rs.53,30,000	Rs.5,00,000
E2	Rs.1,14,00,000	Rs.10,00,000
<b>Total</b>	<b>Rs. 3,08,96,000</b>	<b>Rs. 25,00,000</b>

**EMPLOYMENT BENEFITS**

Location Code	Employment
P1	25
E1	18
E2	18
<b>Total</b>	<b>61</b>

**GREENBELT DEVELOPMENT BENEFITS FROM CLUSTER**

CODE	No of Trees proposed to be planted	Survival %	Name of the Species
P1	2,500	80%	Neem, Pongamia pinnata, Panai
E1	1,500	80%	Neem, Pongamia pinnata
E2	1,500	80%	Neem, Pongamia pinnata
<b>Total</b>	<b>5,500</b>	<b>80%</b>	

**8. PROJECT BENEFITS**

Proposed Project for Quarrying Rough Stone at Dharavendiram Village aims to produce cumulatively 4,87,120 m<sup>3</sup> Rough Stone over a period of 5 Years. This will enhance the socio-economic activities in the adjoining areas and will result in the following benefits

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

**9. ENVIRONMENT MANAGEMENT PLAN**

The Environment Monitoring Cell 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.