

EXECUTIVE SUMMARY

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR
CLUSTER OF QUARRIES
MINOR MINERAL – ROUGH STONE & GRAVEL
(As per EIA Notification, 2006 dated 14.09.2006 and its amendments)**

Category: B1 (Cluster)

Project Proponent

S.No	Name	Extent of Mining Applied
1	Thiru. A. Ammasaiappan	2.35.5 Ha
2	Tmt. S. Selvamani	3.47.5 Ha
3	Tvl. Sri Vetri Velavan Blue Metals	2.39.0 Ha
4	Tmt. M.Sarojini	3.48.0 Ha

Project Details

MYLERIPALAYAM ROUGH STONE AND GRAVEL QUARRY

Cluster Area : 18.29 Ha

Village : Myleripalayam

Taluk : Madukkarai

District : Coimbatore

Terms of Reference issued by SEAC/SEIAA

- i) Lr.No.SEIAA-TN/F.No.8940/SEAC/TOR-1128/2021 dated 23.03.2022 for P 1
- ii) Lr.No.SEIAA-TN/F.No.8941/SEAC/TOR-1119/2022 dated 23.03.2022 for P 2
- iii) Lr.No.SEIAA-TN/F.No.9308/SEAC/ToR-1235/2022 dated 30.08.2022 for P 3
- iv) Lr.No.SEIAA-TN/F.No.9426/SEAC/ToR-1285/2022 dated 08.10.2022 for P 4

EIA CONSULTANT

AADHI BOOMI MINING & ENVIRO TECH (P) LTD (QCI/NABET Accredited EIA Organization)

3/216, K.S.V Nagar, Narasothipatti, Alagapuram (PO),

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Executive Summary

1. INTRODUCTION

The Applicants, **Thiru. A. Ammasaiappan S/o. Arasey Gounder, Tmt. S. Selvamani w/o Subramaniyan, Tvl. Sri Vetri Velavan Blue Metals** and **Tmt. M.Sarojini** have applied for grant of permission for quarrying Rough Stone quarry and gravel quarry in Myleripalayam Village, Madukkarai Taluk, Coimbatore District and Tamil Nadu for a period of Five years.

The Assistant Director, Department of Geology and Mining, Coimbatore has directed the four applicants, Thiru. A. Ammasaiappan S/o. Arasey Gounder, Tmt. S. Selvamani w/o Subramaniyan, Tvl. Sri Vetri Velavan Blue Metals and Tmt. M. Sarojini to get approved mining plan and obtain Environmental clearance from the State Environment Impact Assessment Authority (SEIAA) as per the EIA Notification, 2006 and its amendments for grant of quarrying lease to Rough Stone & Gravel quarry in Myleripalayam Village, Madukkarai Taluk, Coimbatore District, Tamil Nadu for the period of Five years.

The mining plan for rough stone and gravel quarry of four applicants has been prepared as per the Assistant Director's Precise area communication letter under Rule 41 & 42 of Tamil Nadu Minor Minerals Concession Rules, 1959 for quarrying Rough Stone & Gravel and it has been approved by Assistant Director, Department of Geology and Mining, Coimbatore.

As per the cluster letter issued by Assistant Director, Department of Geology and Mining, Coimbatore vide Rc.No.1431/Mines/2021 dated 31.05.2022 for Tvl. Sri Vetri Velavan Blue Metals, the lease area of above said four applicants comes in cluster of 500m radius. The total area of cluster is 18.29 Ha. The extents of lease area of all individual as per cluster letter are given below.

Proposed Quarries

- | | |
|------------------------------------|--------------|
| 1. Tvl. Sri Vetrivelan Blue Metals | – 2.39.0 Ha |
| 2. Thiru.A.Ammasaiappan | – 2.35.5 Ha |
| 3. Thiru.S.Shanmugasundaram | – 2.95.50 Ha |
| 4. Tmt.S.Selvamani | – 3.47.5 Ha |
| 5. Tmt.M.Sarojini | – 3.48.0 Ha |

Existing Quarries

- | | |
|---------------------|-------------|
| 1. Tmt.Meenakshi | – 1.58.0 Ha |
| 2. Thiru.K.Ramraj | – 1.00.0 Ha |
| 3. R.Kathireshkumar | – 1.05.5 Ha |

DRAFT EIA/EMP REPORT FOR CLUSTER OF FOUR QUARRIES
Cluster Area: 18.29 Ha, Rough Stone and Gravel Quarry, Coimbatore District

As the projects comes under B1(cluster) category, the four applicants made TOR application individually through PARIVESH website for carrying out EIA Studies for obtaining Environmental clearance. The details are given in below Table 1.1.

Table No.1.1 Details on Terms of Reference

S.No	Name of Proponent	ToR Application No	SEAC and SEIAA Meeting No	TOR letter No
1.	Thiru. A. Ammasaiappan	SIA/TN/MIN/70882/2021 Dated 07.01.2022	251 st SEAC meeting, dated 04.03.2022 and 495 th SEIAA meeting, dated 23.03.2022	Lr.No.SEIAA-TN/F.No.8940/SEAC/TOR-1128/2021 dated 23.03.2022
2	Tmt. S. Selvamani	SIA/TN/MIN/69516/2021 Dated 03.12.2021	251 st SEAC meeting, dated 04.03.2022 and 495 th SEIAA meeting, dated 23.03.2022	Lr.No.SEIAA-TN/F.No.8941/TOR-1119/2022 dated 23.03.2022
3	Tvl. Sri Vetri Velavan Blue Metals	SIA/TN/MN/77781/2022 dated.04.06.2022	302 nd SEAC meeting, dated 17.08.2022 and 547 th SEIAA meeting, dated 30.08.2022	Lr.No.SEIAA-TN/F.No.9308/SEAC/ToR-1235/2022 dated 30.08.2022
4	Tmt. M.Sarojini	SIA/TN/MN/81043/2022 dated 21.07.2022	312 th SEAC meeting, dated 16.09.2022 and 557 th SEIAA meeting, dated 08.10.2022.	Lr.No.SEIAA-TN/F.No.9426/SEAC/ToR-1285/2022 dated 08.10.2022

In TOR letters, it is mentioned that public hearing needs to be conducted for the proposed rough stone quarry of four project proponent for obtaining EC. As per MoEF&CC OM: F.No.L-11011/175/2018-IA-II(M), dated 12.12.2018, there shall be one public consultation for entire cluster after which the final Environmental Impact Assessment Report or Environmental Management Plan report for the cluster shall be prepared. Based on the OM issued by MOEF & CC, the combined Draft EIA/EMP report has been prepared for the four quarries in the cluster of 18.29 Ha for conducting public hearing.

The points raised in the public hearing and the commitments of the project proponent will be given detail in the Final EIA Report which will be submitted to SEAC/SEIAA, TN for obtaining environmental clearance.

DRAFT EIA/EMP REPORT FOR CLUSTER OF FOUR QUARRIES
Cluster Area: 18.29 Ha, Rough Stone and Gravel Quarry, Coimbatore District

1.1 Details of Project and Project Proponent

Table No 1.2 Details on Project and Project Proponent

A. Proposed Projects to Conduct Public Hearing	
1. Thiru. A. Ammasaiappan	
Particulars	Details
Address of the Project Proponent	THIRU.A. AMMASAIAPPAN S/o. Arasey Gounder, No. 4/90A, S.K.M.S Illam, Kurumbapalayam Madukkarai Taluk, Coimbatore District. Mob: 98945996353 Email: ammasaiappanrscbe@gmail.com
Lease Area	2.35.5 Hectares (Patta Land)
Site Location	S.F.No: 72/1, 2, 3 , Myleripalayam Village, Madukkarai Taluk, Coimbatore District and Tamil Nadu
Geographical Co-ordinates	Latitude: 10°51'50.37519"N to 10°51'58.03831" N Longitude: 77°02'05.87456" E to 77°02'10.29629" E
Toposheet No.	58F/1
Elevation	Elevation of the area is 400m above MSL
Precise Area Communication	Rc No. 453/Mines/2021, dated 16.12.2021
Period of Lease	Five years from the date of execution.
Mining Plan Approval Details	Mining plan approved by AD, Dept of Geology and Mining Vide Rc No. 453/Mines/2021, Dated 31.12.2021
AD Cluster letter	Rc No. 453/Mines/2021/, Dated 31.12.2021
2. Tmt. S. Selvamani	
Particulars	Details
Address of the Project Proponent	Tmt.S.Selvamani W/o Subramaniyan, No.1/525, North Thottam, Malumitchampatti, Madukkarai taluk, Coimbatore District. Mob: 9965526700, 9994145359
Lease Area	3.47.5 Hectares (Patta Land)
Site Location	S.F. No.67/2 & 69, Myleripalayam Village, Madukkarai Taluk, Coimbatore District and Tamil Nadu
Geographical Co-ordinates	Latitude: 10°51'56.04239"N to 10°52'05.1021" N Longitude: 77°01'56.64545" E to 77°02'03.3589" E
Toposheet No.	58F/1
Elevation	Elevation of the area is 400m above MSL

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Precise Area communication	Rc No. 807/Mines/2021/, Dated 18.10.2021
Period of Lease	Five years from the date of execution.
Mining Plan Approval Details	Mining plan approved by AD, Dept of Geology and Mining Vide Rc No. 807/Mines/2021/, Dated 25.11.2021
AD Cluster letter	Rc No. 807/Mines/2021/, Dated 25.11.2021

3. Tvl. Sri Vetri Velavan Blue Metals

Particulars	Details
Address of the Project Proponent	Tvl. SREE VETRIVELAVAN BLUE METALS Door no. 16/133 F, Sathy main road east Saravananpatti- 641035 Coimbatore, Tamil Nadu. E.mail: svvbluemetals@gmail.com Mob: 9944822858
Lease Area	2.39.0 Hectares (Patta Land)
Site Location	S.F.No: 70/2, 70/3, Myleripalayam Village, Madukkarai Taluk, Coimbatore District, Tamil Nadu.
Geographical Co-ordinates	Latitude: 10°52'0.69"N to 10°52'7.60"N Longitude: 77° 2'4.77"E to 77° 2'10.15"E
Toposheet No.	58F/1
Elevation	Elevation of the area is 400m above MSL
Precise Area communication	Rc.No.1431/Mines/2021, Dated 13.05.2022
Period of Lease	Five years from the date of execution.
Mining Plan Approval Details	Mining plan approved by AD, Department of Geology and Mining, Coimbatore District vide Rc No. 1431/Mines/2021/, Dated 31.05.2022
AD Cluster letter	Rc.No.1431/Mines/2021, Dated 31.05.2022.

4. Tmt. M.Sarojini

Particulars	Details
Address of the Project Proponent	Tmt. M.Sarojini W/o.K.Marudhachalam 4/61-E, Kurumbapalayam Road, Madukkarai Village, Madukkarai Taluk, Pincode: 641 105. Coimbatore District. Mob: 9360004356, 8098001512
Lease Area	3.48.0 Hectares (Patta Land)

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Cluster Area: 18.29 Ha, Rough Stone and Gravel Quarry, Coimbatore District

Site Location	S.F.No.67/1 & 68, Myleripalayam Village, Madukkarai Taluk, Coimbatore District, Tamil Nadu.
Geographical Co-ordinates	Latitude: N10°51'55.8205" to N10°52'04.6490" Longitude: E77°01'53.0343" to E77°01'58.8656"
Toposheet No.	58F/1
Elevation	Elevation of the area is 400m above MSL
Precise Area communication	R.C.No.927/Mines/2021, dated 24.06.2022
Period of Lease	Five years from the date of execution.
Mining Plan Approval Details	Mining plan approved by AD, Department of Geology and Mining, Coimbatore District vide R.C.No.927/Mines/2021, dated 06.07.2022.
AD Cluster letter	R.C.No.927/Mines/2021, dated 06.07.2022
B. Proposed Quarries – Public Hearing Completed Files and Awaiting for EC	
1. S.Shanmuga sundaram	
Address of the Project Proponent	Thiru. S.Shanmugasundaram S/o. Thiru I.Subbaian, Arasampalayam Village, Kenathukadavu, Coimbatore District. Tamil Nadu. Pin Code – 642 109. Ph: +919443933864, +917708433698.
Lease Area	2.95.5 Hectares (Patta Land)
Site Location	73/1, 73/2, 73/3 and 73/4, Myleripalayam Village, Madukkarai Taluk, Coimbatore District, Tamil Nadu
Precise Area communication	letter No. 182/Mines/2019 dated 15.07.2019
Period of Lease	Five years from the date of execution.
Mining Plan Approval Details	Rc.No.182/Mines/2019 Dated 24.07.2019
Public Hearing date	31.08.2021
EC Proposal No & Status	SIA/TN/MIN/67675/2019 & Awaiting for EC
C. Existing Quarries	
1.Tmt.A.Meenakshi	
Lease Area	1.58.0Ha
Site Location	74/1, 74/2, 75 Myleripalayam Village, Madukkarai Taluk, Coimbatore District, Tamil Nadu.
2. Thiru.K.Ramraj	
Lease Area	1.00.0 Ha
Site Location	70/1(P), 70/1 Myleripalayam Village, Madukkarai Taluk,

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	Coimbatore District, Tamil Nadu.
3.R.Kathireskumar	
Lease Area	1.05.5 Ha
Site Location	165A/3A, 165A/3C

1.2 SCOPE OF THEPROJECT

The proposal for Environmental Clearance of Proposed Rough stone & Gravel quarry of **Thiru. A. Ammasaiappan S/o. Arasey Gounder, Tmt. S. Selvamani w/o Subramaniyan, Tvl. Sri Vetri Velavan Blue Metals** and **Tmt. M. Sarojini** require EIA/EMP Report as per respective Terms of Reference.

1.3 ENVIRONMENTAL SETTINGS & MINING DETAILS

Table 1.3 Accessibility				
Nearest Village	Myleripalayam <ul style="list-style-type: none"> • For Lease Area of A.Ammasaiappan – 1.2km – NW • For Lease Area of S.Selvamani - 800m – NW • For Lease Area of Tvl.Sree Vetrivelavan Blue Metals – 1.1km – NW • For Lease Area of M.Sarojini - 800m – NW 			
Nearest Settlement	Sno	Village Name	Total population as per 2011 census	Distance with Direction
	1	Myleripalayam	4990	1.2 km-NW
	2	Karacheri	4892	3.0 km-E
	3	Arasampalayam	3818	1.8 km -S
	4	Solavampalayam	6387	3.0 km- SW
	5	Kondampatti	2467	4.5 km- SE
	6	Kinathukadavu (TP)	8653	5.5 km-SW
	7	Chettipalayam	3370	5.5 km-N
	8	Okilipalayam	996	4.0 km-NW
	9	Malumichampatti (CT)	12936	5.5 km-NW

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	10	Vadasithur	5080	6.0 km-SE
Nearest Town	Coimbatore – 20 km - NW			
Nearest Roadway	MDR-988 – Arsampalayam -- Myleripalayam – 680 m – Southwest NH -83 – Pollachi -- Coimbatore – 2.5 km - West SH-163 – Chettipalayam -- Pappampatti – 4.0 km - North			
Nearest Railway station	Kinathukadavu Railway Station– 3.9 km –SW			
Nearest Airport	Coimbatore International Airport –20km – N			

Table No 1.4 Environmental Sensitiveness

Interstate Boundary	Tamil Nadu –Kerala Interstate boundary –17.6km (SW)
Coastal Zone	Arabian Sea – 117km – West
Reserve Forest	Polampatti Block –I R.F – 10.79 km The proposed projects site does not attract Forest Conservation Act, 1980.
Wildlife sanctuary	Nil within 10km radius. The Proposed projects site does not the Wildlife (Protection) Act, 1972.
Water bodies	1. Kothavadi river–SE-6.7km 1. Kothavadi Lake – SE – 6.4km
Defense Installations	Nil within 10km radius
Critically Polluted area	Nil within 10km radius

Table No 1.5 Mining Details – A.Ammasaiappan

Method of Mining	Open cast Semi -Mechanized method of mining				
Geological resources (95%)	246511m ³				
Mineable reserves (95%)	216315m ³				
Production (95%)	Rough stone- 200299m ³ for five years or 40059.8 m ³ /annum (Avg)				
Top soil	Gravel – 12212m ³				
Ore: Waste ratio	1: 0.05				
Depth of Mining	32m bgl				
Water Table	40-42 m bgl				
Road design	1: 10 inside the pit and ramp 1:16 for transport				
Overall Pit Slope	45°				
Period of Lease	5 years from the date of execution				
Existing pit dimension	Pit	Bench	L(m)	W(m)	D(m)
	I	I	123m	105m	17m(R.L. 400m – 383m)

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Project Cost	Rs 36.10 Lakhs				
EMP Cost	Rs 4.00 lakhs				
CER Cost	Rs.5 lakhs				
Table No 1.6 Mining Details – S.Selvamani					
Method of Mining	Open cast Semi -Mechanized method of mining				
Geological resources (95%)	478373m ³				
Mineable reserves (95%)	441026m ³				
Production (95%)	Rough stone- 326342m ³ for five years or 65268.4 m ³ /annum.(Avg)				
Top soil	Gravel – 10656m ³				
Reject (5%)	17176 m ³				
Ore: Waste ratio	1: 0.05				
Depth of Mining	38m bgl.				
Water Table	40-42 m bgl				
Road design	1: 10 inside the pit and ramp 1:16 for transport				
Overall Pit Slope	45°				
Period of Lease	5 years from the date of execution				
Existing pit dimension	Pit	Bench	L(m)	W(m)	D(m)
	I	I	225m	95m	22m(R.L. 402m – 380m)
Existing Dump Dimension	S.No	L(m)	W(m)	D(m)	
	Dump I	48m	45m	4m(R.L. 402m – 406m)	
	Dump II	68	38	4m(R.L. 402m – 406m)	
Project Cost	Rs 44.10 Lakhs				
EMP Cost	Rs 4.00 lakhs				
CER Cost	Rs.5 lakhs				
Table No 1.7 Mining Details – Tvl.Sree Vetrivelavan Blue Metals					
Method of Mining	Open cast Semi -Mechanized method of mining				
Geological resources	867890m ³				
Mineable reserves	327148m ³				
Production (95%)	Rough stone- 310791m ³ @ 95% for five years or 62158 m ³ /annum.(Avg)				
Top soil	Gravel – 31618m ³				
Reject (5%)	16357 m ³				
Ore: Waste ratio	1: 0.05				
Depth of Mining	34m bgl				
Water Table	40-42 m bgl				
Road design	1: 10 inside the pit and ramp 1:16 for transport				

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Overall Pit Slope	45°				
Period of Lease	5 years from the date of execution				
Existing pit dimension	Nil as it is fresh area				
Project Cost	81 Lakhs				
EMP Cost	6.75 Lakhs				
CER Cost	Rs.5 lakhs				
Table No 1.8 Mining Details – Tmt.M.Sarojini					
Method of Mining	Open cast Semi -Mechanized method of mining				
Geological resources	361530m ³				
Mineable reserves	Rough Stone (95%): 304716m³ for 5 years Gravel: 1350m³				
Production (95%)	Rough Stone (95%): 304716m³ for 5 years Gravel: 1350m³				
Top soil	Gravel – 1350m ³				
Reject (5%)	16038 m ³				
Ore: Waste ratio	1: 0.05				
Depth of Mining	32m bgl				
Water Table	40-42 m bgl				
Road design	1: 10 inside the pit and ramp 1:16 for transport				
Overall Pit Slope	45°				
Period of Lease	5 years from the date of execution				
Existing pit dimension	Pit	L(m)	W(m)	D(m)	Elevation
	I	97m	67m	16m	401m to 385m
Project Cost	Rs.95 Lakhs				
EMP Cost	Rs.8.75 Lakhs				
CER Cost	Rs.5 lakhs				

1.4 Description of the environment

1.4.1 Base line environmental study

Collection of base line data is an integral part of the preparation of environmental impact assessment reports. The baseline monitoring study has been carried out during October 1st 2019 – December 31st 2019 to assess the existing environmental scenario in the area. For the purpose of EIA studies, mine lease area was considered as the core zone and area outside the mine lease boundary up to 10km radius from the lease boundary was considered as buffer zone.

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Table No 1.9 Baseline Data

Particulars	Details	Standards
Meteorology (October 1st 2019 – December 31st, 2019)		
Rainfall (Avg.)	647.2 mm	--
Temperature (Avg.)	18-32°C	--
Wind speed	1.13 m/s	--
Wind Direction	NE & SW directions	
Ambient Air Quality (NAAQS)		
PM ₁₀	40.5-70.2 µg/m ³	100 µg/m ³
PM _{2.5}	25.4-39.4 µg/m ³	60 µg/m ³
SO ₂	5.6-8.1 µg/m ³	80 µg/m ³
NO _x	7.8-13.7 µg /m ³	80 µg/m ³
Noise Level (CPCB Standards)		
Day time (6:00 am - 10:00 pm)	Core zone – 31.7-39.4 dB (A) Buffer zone – 34.6- 41.7 dB (A)	Industrial Area Day Time - 75 dB (A) Residential Area Day Time – 55 dB (A)
Night time (10:00 pm - 06:00 am)	Core zone – 30.4 – 38.2 dB (A) Buffer zone – 29.4-38.2 dB(A)	Industrial Area Night Time – 70 dB(A) Residential Area Night Time – 45 dB (A)
Water Quality IS 10500:2012 (Desirable limits)		
pH	7.44-7.76	6.5 to 8.5
TDS	490-520 mg/l	500 mg/l
Electrical conductivity at 25°C	860-1010micromhos/cm	-
Total Hardness as CaCO ₃	390-436 mg/l	200 mg/l
Silica SiO ₂	56-58 mg/l	-
Total suspended solids	BDL(DL=1.0)	IS:3025:P.16:1984:R.2012
Chlorides Cl	98-110 mg/l	250
Total iron Fe	BDL(DL=0.01)	0.3mg/l
Sulfates SO ₄	53-58 mg/l	200 mg/l
Soil Quality		
pH	6.65-7.08	Neutral to slightly alkaline
Bulk density	1.32-1.47 g/cc	Favorable physical condition for plant growth.
Hydro Geology		
Water Table	40-42mbgl	

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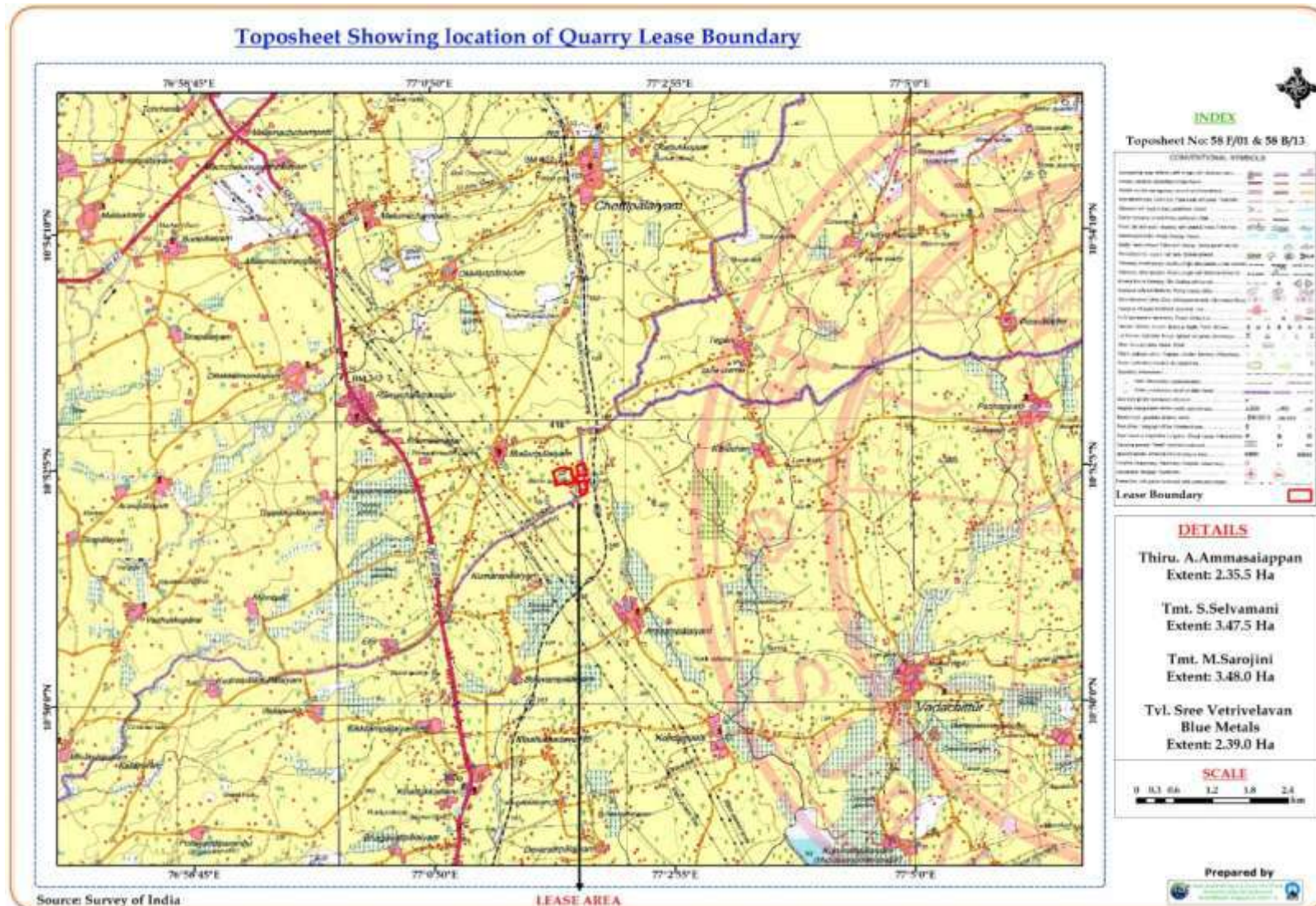


Fig No 1.1 Toposheet showing location of the lease area

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Cluster Area: 18.29 Ha, Rough Stone and Gravel Quarry, Coimbatore District

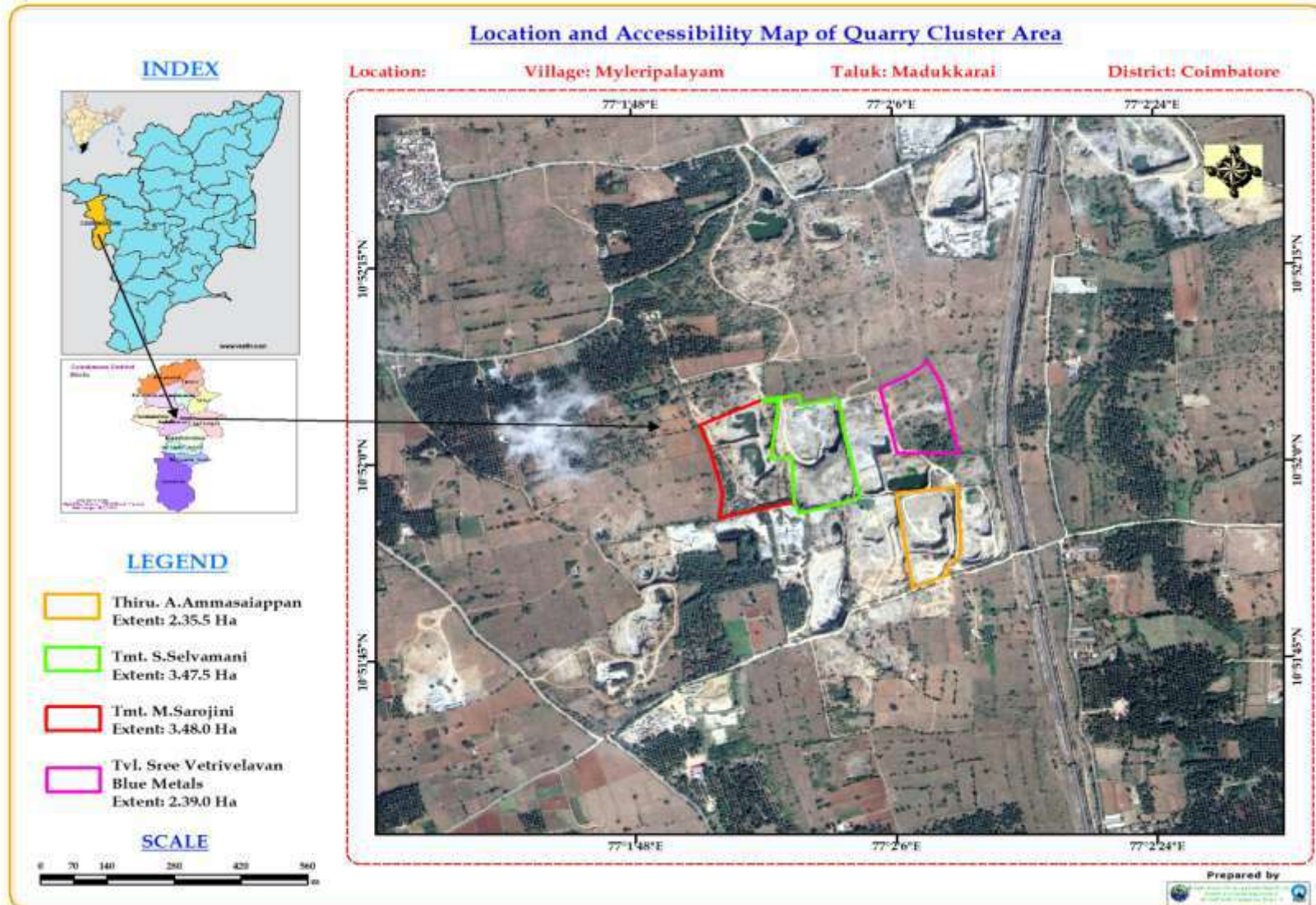


Fig No 1.2 Map Showing the Location and Accessibility of Quarry Lease Boundary

DRAFT EIA/EMP REPORT FOR CLUSTER OF FOUR QUARRIES
Cluster Area: 18.29 Ha, Rough Stone and Gravel Quarry, Coimbatore District

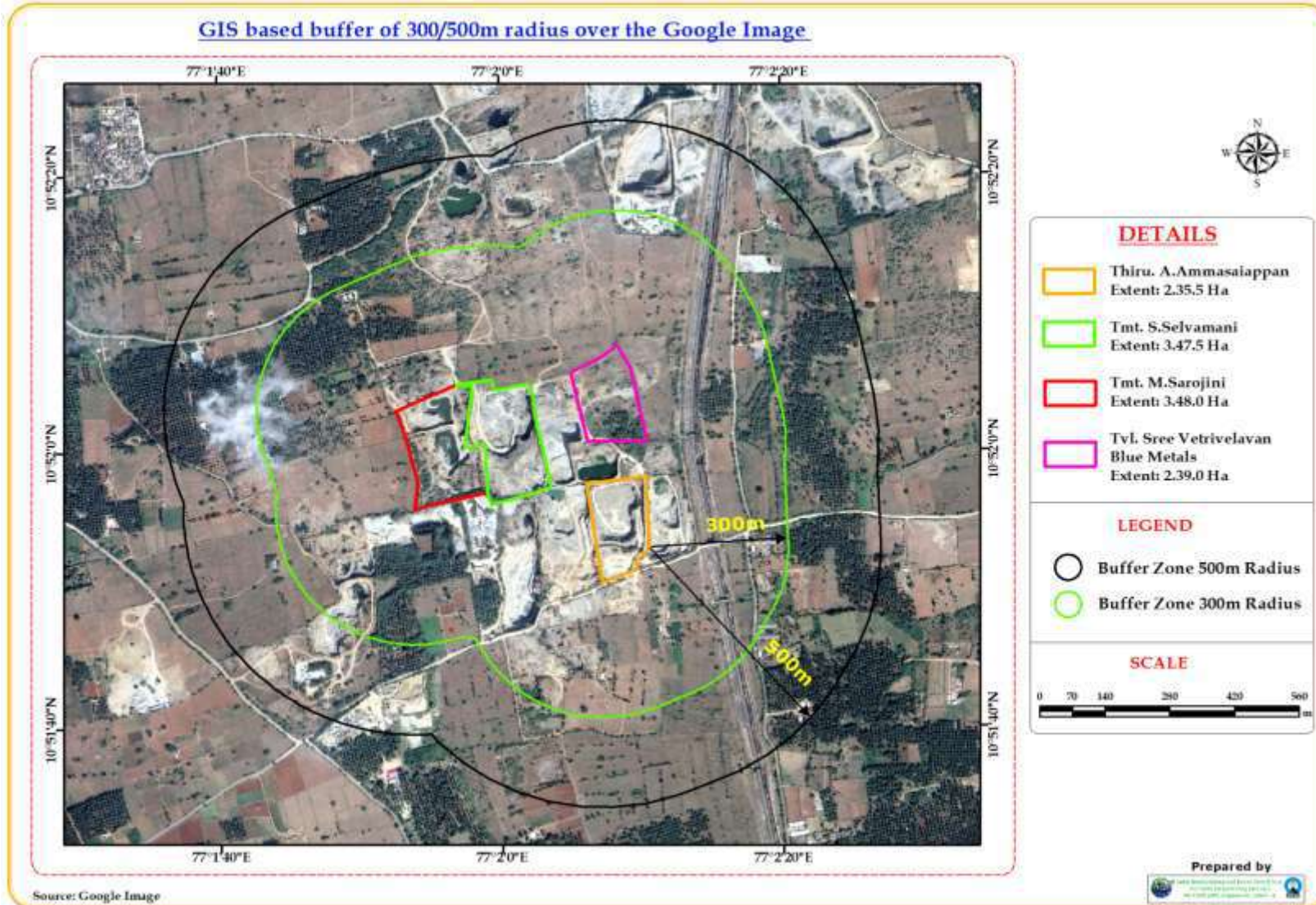


Fig No 1.3 Google Earth Image showing 300m and 500m radius around lease area

DRAFT EIA/EMP REPORT FOR CLUSTER OF FOUR QUARRIES
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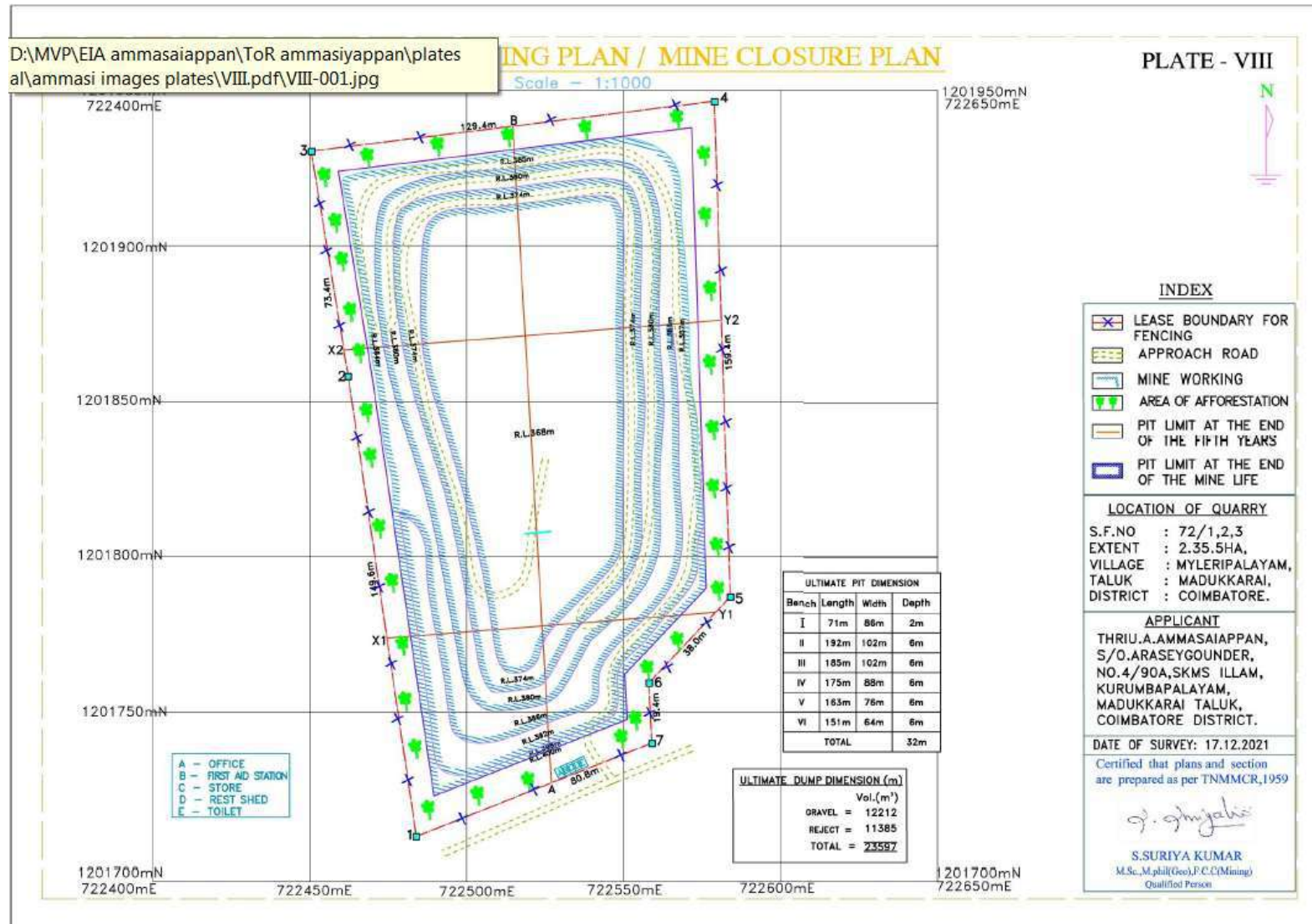


Fig No 1.4 Conceptual plan of the proposed Thiru.A.Ammasaiappan

DRAFT EIA/EMP REPORT FOR CLUSTER OF FOUR QUARRIES
Cluster Area: 18.29 Ha, Rough Stone and Gravel Quarry, Coimbatore District

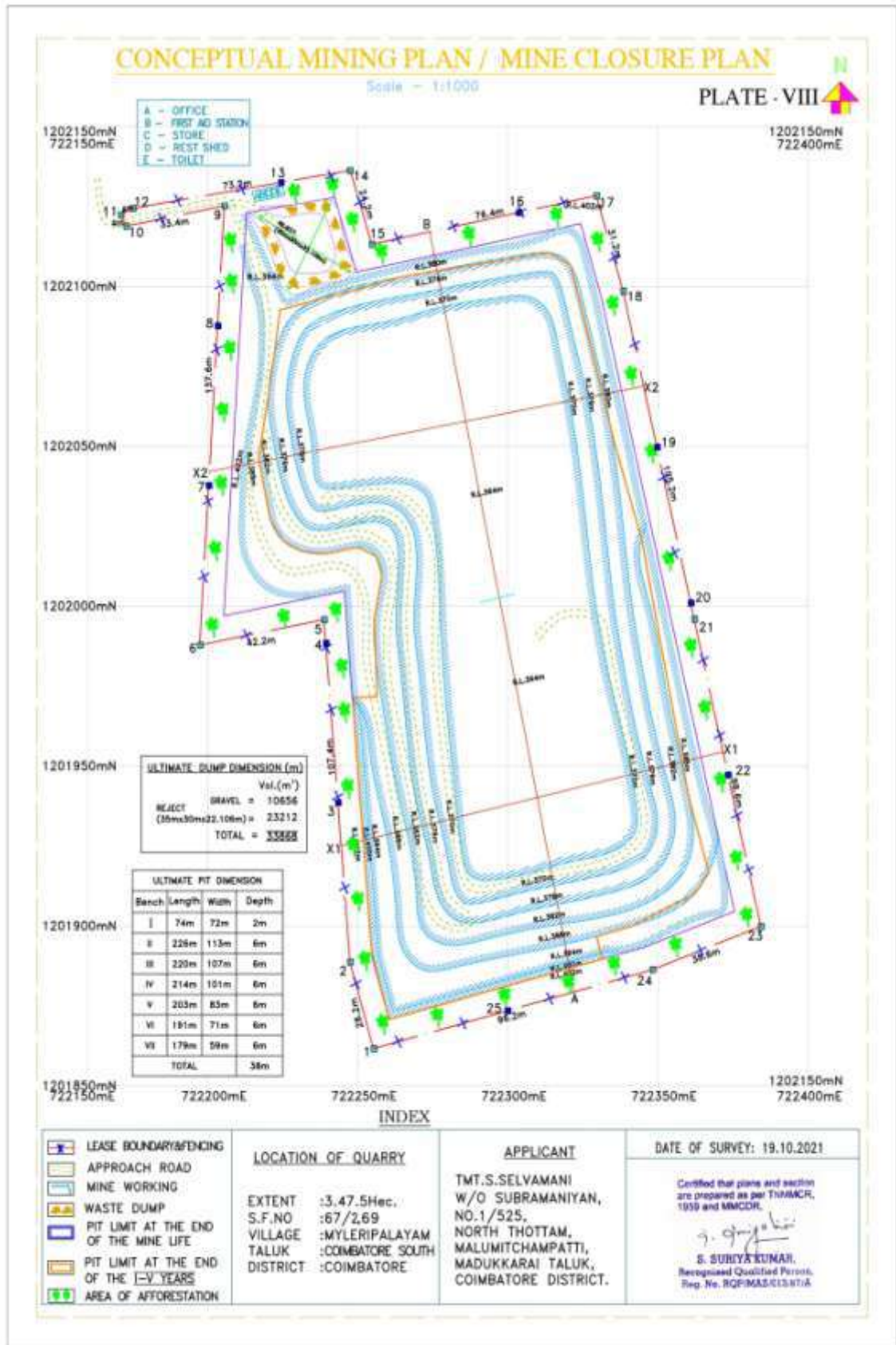


Fig No 1.5 Conceptual plan of the proposed Tmt.S.Selvamani

DRAFT EIA/EMP REPORT FOR CLUSTER OF FOUR QUARRIES
Cluster Area: 18.29 Ha, Rough Stone and Gravel Quarry, Coimbatore District

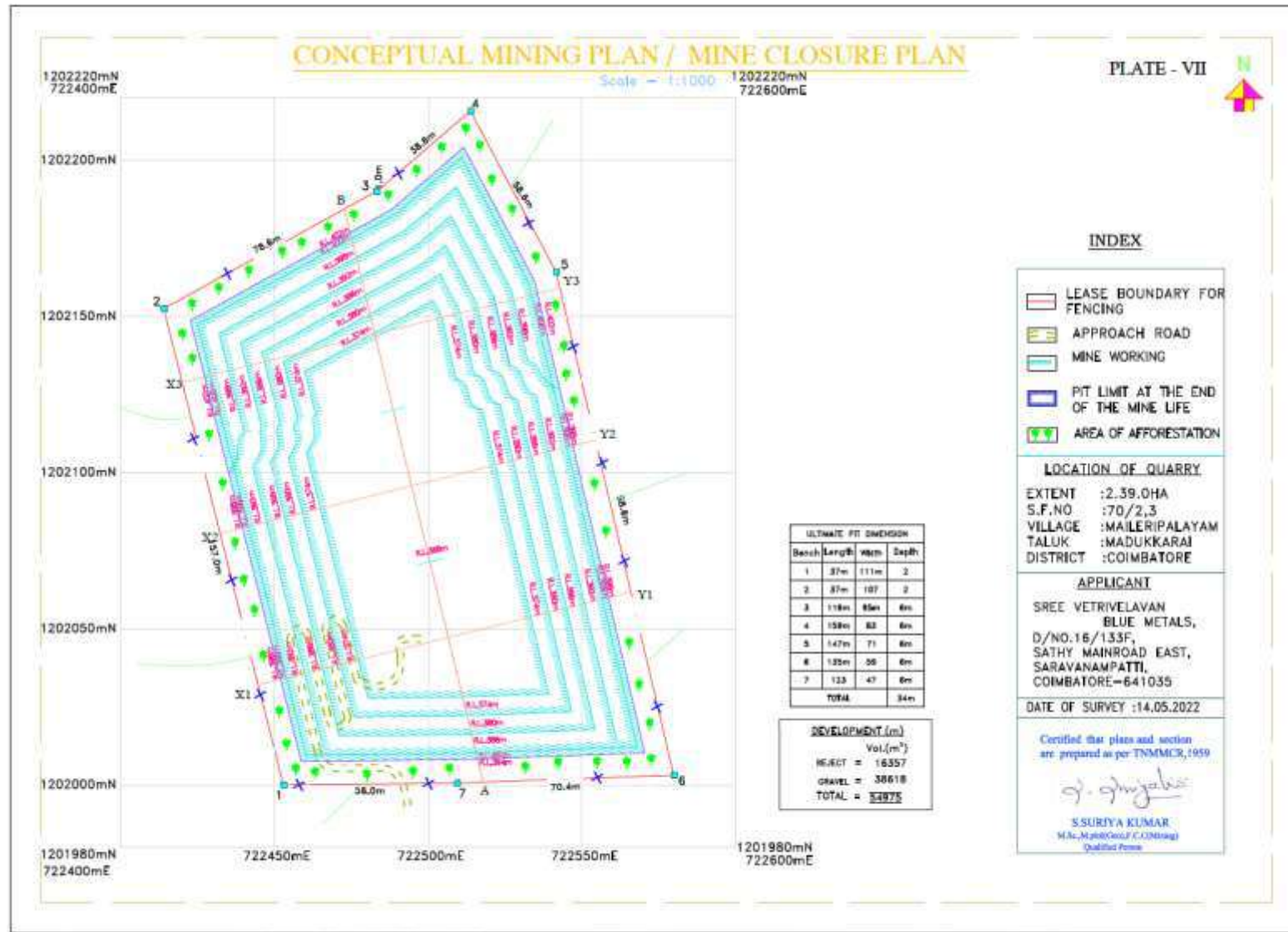


Fig No 1.6 Conceptual plan of the proposed Sree Vetrivelavan Blue Metals

DRAFT EIA/EMP REPORT FOR CLUSTER OF FOUR QUARRIES
Cluster Area: 18.29 Ha, Rough Stone and Gravel Quarry, Coimbatore District



Fig No 1.7 Conceptual plan of the proposed Tmt.M.Sarojini

1.5 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1.5.1 Air Environment

The air borne particulate matter is the main air pollutant by opencast mining. The mining operation will be carried out by adopting semi-mechanized methods which involves Jack Hammer drilling and blasting, excavation, loading and transportation.

Total predicted 24-h maximum GLC of PM₁₀ at project site for scenario 1 i.e loading-unloading and transportation and scenario 2 i.e blasting was 87.2µg/m³ and 76.2µg/m³ respectively occurred at the project site after superposition of base-line value 70.2µg/m³ over the incremental 17µg/m³ and 6µg/m³ respectively due to combined impact of loading and unloading and transportation over the haul road and due to blasting. The predicted incremental GLC of SO_x and NO_x for scenario 3 i.e. due to the operation of excavator and movement of vehicle in the project site were found to be 1.4µg/m³ and 2.7µg/m³ respectively occurred at the project site. Therefore the total predicted GLC of SO_x and NO_x after superposition of base-line value 9.5µg/m³ and 15.8µg/m³.

The above prediction is for one quarry. Assume that emission rate from the various mining activity in adjacent seven quarries are same. So the incremental GLC will also be same. Therefore when eight adjacent quarries are working together, the incremental GLC and total predicted GLC will be very high. The installation of more number of water sprinklers will combat the incremental increase of GLC and to maintain the parameters within the limits of NAAQS.

1.5.2 Noise Environment

Noise pollution poses a major health risk to the mine workers. The sources of noise in the proposed open cast rough stone & gravel quarry are such as Drilling, Blasting, and during movement of vehicles.

The noise generated by the mining activity is dissipated within the core zone. This is because of distance involved and other topographical features adding to the noise attenuation. From the results, it can be seen that the ambient noise levels (day time and night time) at all the locations will remain within permissible limits prescribed by CPCB and 90dB (A) norms of DGMS. At present there is no mining activity carried out. However, the expected noise levels are not likely to have any effect. Precaution will be made to keep down the noise exposure level of 85 dB (A) to the operating personnel for 8 hrs duration.

1.5.3 Ground Vibration

a) Thiru. A. Ammasaiappan Rough Stone Quarry

The charge per blast of 50kg is above the Peak Particle Velocity of 5mm/s. So the proponent will be advised to use two delays to keep the ground vibration within 5mm/s. The nearest habitation is 220m –E.

b) Tmt.S.Selvamani Rough Stone Quarry

The charge per blast of 82kg is above the Peak Particle Velocity of 5mm/s. So the proponent will be advised to use two delays to keep the ground vibration within 5mm/s. The nearest habitation is 260m –NW.

c) Tvl. Vetrivelavan Blue Metals Rough Stone Quarry

The charge per blast of 74kg is above the Peak Particle Velocity of 5mm/s. So the proponent will be advised to use two delays to keep the ground vibration within 5mm/s. The nearest habitation is 260m –E.

d) Tmt.M.Sarojini Blue Metals Rough Stone Quarry

The charge per blast of 76kg is above the Peak Particle Velocity of 5mm/s. So the proponent will be recommended to use five delays to keep the ground vibration within 5mm/s. The nearest habitation is 132m –NW.

1.5.4 Water Environment

Mining operations can affect groundwater quality in several ways. The most obvious occurs in the mining below the water table, either in underground workings or open pits. This provides a direct conduit to aquifers. Groundwater quality is also affected when waters (natural or process waters or wastewater) infiltrate through surface materials (including overlying waste or other material) into ground water. But this Rough stone mine is devoid of any such impacts.

The impact due to mining on the water quality is expected to be insignificant because of no use of chemicals or hazardous substances during mining process. The depths of mining of four proposed quarries are above the ground water table and it will not intersect ground water table and it is 30m below ground level. The water sample from all the locations including core zone except Pungambadi has high TDS and TH exceeds the permissible limit. Chlorides were found to be high in all the five

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locations. Total coliform was found in the range of 27 MPN index/100ml to 220MPN index/100ml at 95 percent confidence limit in all the water samples. E.coli was found <2 in all the water samples. Based on the Water Quality Index calculated, water qualities from all location were poor to unfit for drinking. For excellent quality, the water should be treated by reverse osmosis to reduce dissolved solids and total hardness to the required rate. Boiling, chlorination of water will remove the microorganisms effectively from all waters in the above said villages and core zone making the water aseptically fit for drinking purposes.

Prolonged consumption of water containing high TH causes Cardio vascular problems, diabetes, skin diseases, rashes, reproductive failure and renal failure. For the excellent quality of drinking the water must be treated with reverse osmosis process to overcome above mentioned such impacts on human body. Boiling of water will remove the microorganisms effectively from all waters in the above said villages and core zone making the water aseptically fit for drinking purposes.

1.5.5 Soil Environment

a) Thiru. A. Ammasaiappan Rough Stone Quarry

The limited quantity of top soil generated will be dumped along 7.5m inner boundary of the lease area. The top soil will be used to develop greenbelt within the lease area. No chemical or toxic elements will be used during mining activity. So the health of soil in and around the quarry will not be affected. The 12212m³ of gravel generated upto the depth of 2m will be sold to the local needy customers.

b) Tmt.S.Selvamani Rough Stone Quarry

The limited quantity of top soil generated will be dumped along 7.5m inner boundary of the lease area. The top soil will be used to develop greenbelt within the lease area. No chemical or toxic elements will be used during mining activity. So the health of soil in and around the quarry will not be affected. The 10656m³ of gravel generated upto the depth of 2m will be sold to the local needy customers.

c) Tvl. Vetrivelavan Blue Metals Rough Stone Quarry

The limited quantity of top soil generated will be dumped along 7.5m inner boundary of the lease area. The top soil will be used to develop greenbelt within the lease area. No chemical or toxic elements will be used during mining activity. So the

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health of soil in and around the quarry will not be affected. The 31618m³ of gravel generated upto the depth of 2m will be sold to the local needy customers.

d) Tmt.M.Sarojini Blue Metals Rough Stone Quarry

The limited quantity of top soil generated will be dumped along 7.5m inner boundary of the lease area. The top soil will be used to develop greenbelt within the lease area. No chemical or toxic elements will be used during mining activity. So the health of soil in and around the quarry will not be affected. The 1350m³ of gravel generated upto the depth of 2m will be sold to the local needy customers.

1.5.6 Waste Dump

a) Thiru. A. Ammasaiappan Rough Stone Quarry

The proposed rate of production of Rough stone for five years is about 200299m³ at the rate of 95% recovery up to permissible depth. The 5% reject of 10542m³ shall be dumped as per earmarked site in the approved mining plan.

b) Tmt.S.Selvamani Rough Stone Quarry

The proposed rate of production of Rough stone for five years is about 326342m³ at the rate of 95% recovery up to permissible depth. The 5% reject of 17176m³ shall be dumped as per earmarked site in the approved mining plan.

c) Tvl. Vetrivelavan Blue Metals Rough Stone Quarry

The proposed rate of production of Rough stone for five years is about 310791m³ at the rate of 95% recovery up to permissible depth. The 5% reject of 16357m³ shall be dumped as per earmarked site in the approved mining plan.

d) Tmt.M.Sarojini Blue Metals Rough Stone Quarry

The proposed rate of production of Rough stone for five years is about 304716m³ at the rate of 95% recovery up to permissible depth. The 5% reject of 16038m³ shall be dumped as per earmarked site in the approved mining plan.

1.5.7 Biological Environment

There are no notified endangered species in the area, which may be affected due to the quarry activities; therefore the biological environment will not have significant

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impact due to quarrying activity. The impact on the biological environment due to amount of dust generation is minimized by well-developed green belt in and around the quarry lease area.

1.5.8 Land Environment

Rough stone & gravel quarry project will result in disturbance of the land use pattern of the mine lease area. The land degradation is unavoidable during quarry activities like excavation, overburden dumping, soil extraction etc. So reclamation of mined out land and proper formation of benches will be given due importance as a step for sound land resource management.

The land use analyses show that the area is of predominantly Agriculture followed by buffer zones of the study area, which clearly indicates that the development of agriculture land increases over a period of time. At the end of the project, the quarried pit will be act as water storage pond. The stored water will be used for developing agricultural activity around the mining lease area. It is generally agreed that as the total volume of production from year to year may increases. Some fallow land also increases due to seasonal crop production, which shows a positive impact due to mining activity.

1.5.9 Socio Economic Environment

The quarrying activity will definitely increase the employment opportunity (directly as well as indirectly) in the project area. Some of these impacts would be beneficial. The expectation of the people of area is concerned towards employment, education, road and health facilities. The literacy rate may be increased with the economic benefits which may arise from the quarrying activities.

a) Thiru. A. Ammasaiappan Rough Stone Quarry

Direct Employment - 19 persons

Indirect Employment - 20 persons

b) Tmt.S.Selvamani Rough Stone Quarry

Direct Employment - 20 persons

Indirect Employment - 20 persons

c) Tvl. Vetrivelavan Blue Metals Rough Stone Quarry

Direct Employment - 20 persons

Indirect Employment - 20 persons

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d) Tmt.M.Sarojini Blue Metals Rough Stone Quarry

Direct Employment - 19 persons

Indirect Employment - 20 persons

Indirect employment is that people will keep shops such as tea shops, hotels, spare parts store, mechanic shed, etc. around the quarry depending on the proposed projects. Population rate is increased day by day in India. It is necessary to create employment to all people for their livelihood and country's economic development.

Table 1.10 Environmental Management Plan

S.No	Parameters	Mining Activity	Mitigation measures
1	Air Environment	Drilling	<ul style="list-style-type: none"> ○ Dust extractor or wet drilling to be followed to control dust at source of emission ○ Use of Sharp drill bits for drilling holes and charging the holes by using optimum charge and using time delay detonator
		Blasting	<ul style="list-style-type: none"> ○ Regular water sprinkling on blasted heaps at regular intervals will help in reducing considerable dust pollution
		Loading	<ul style="list-style-type: none"> ○ Water sprinkling be done before loading by making it moist
		Transportation	<ul style="list-style-type: none"> ○ Water sprinklers along the sides of haul road shall be fixed to control fly of dust while transporting minerals and waste ○ Overloading will be prevented ○ Trucks/Dumpers covered by tarpaulin covers
		DG Sets	<ul style="list-style-type: none"> ○ DG sets will be used only during power failure ○ Adequate stack height for DG sets will be provided as per CPCB norms
		General measures	<ul style="list-style-type: none"> ○ Avenue trees along roads around ML boundary shall be planted as per the norms of MoEF to control fly of dust. ○ Labours engaged in such dust prone areas should be provided with safety devices like ear muff, mask, goggles as per the MMR,

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			<p>1961 amendments and circulars of DGMS.</p> <ul style="list-style-type: none"> ○ Regular health check-up of workers and nearby villagers in the impacted area should be carried out and also regular occupational health assessment of employees should be carried out as per the Factories Act ○ Ambient Air Quality Monitoring will be conducted on regular basis to assess the quality of ambient air.
2	Water Environment	Surface water	<ul style="list-style-type: none"> ○ Wastewater discharge from mine if any will be treated in settling tanks before using for dust suppression and tree plantation purposes.
		Ground water	<ul style="list-style-type: none"> ○ The mining activity will not intersect the ground water table ○ De silting will be carried out before and immediately after the monsoon season
		Storm water	<ul style="list-style-type: none"> ○ Pit will be used for Storage of rainwater ○ Rain water will be collected in sump in the mining pit 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 rain water harvesting
		General measures	<ul style="list-style-type: none"> ○ Regular monitoring and analyzing the quality of water
3	Noise Environment	Drilling	<ul style="list-style-type: none"> ○ Limiting time exposure of workers to excessive noise
		Blasting	<ul style="list-style-type: none"> ○ Carrying out blasting only during day time and not on cloudy days ○ Noise levels will be controlled by using optimum explosive charge, proper delay

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			<p>detonators and proper stemming to prevent blow out of holes.</p> <ul style="list-style-type: none"> ○ Providing proper noise proof enclosure for the workers separated from the noise source and noise prone equipment
		Transportation	<ul style="list-style-type: none"> ○ Proper and regular maintenance of vehicles, machinery and other equipments. ○ The noise generated by the machinery will be reduced by proper lubrication of the machinery and other equipments. ○ Speed of trucks entering or leaving the mine will be limited to moderate speed to prevent undue noise from empty vehicles. ○ Adequate silencers will be provided in all the diesel engines of vehicles. ○ Minimum use of horns and speed limit of 10 km/hr in the village area. ○ It will be ensured that all transportation vehicles carry a valid PUC Certificates
		General measures	<ul style="list-style-type: none"> ○ Use of personal protective devices i.e., earmuffs and earplugs by workers, who are working in high noise generating areas ○ Provision of Quiet areas, where employees can get relief from workplace noise. ○ The development of green belts around the periphery of the mine to attenuate noise. ○ Regular medical check-up and proper training to personnel to create awareness about adverse noise level effects.
4	Vibration	Blasting	<ul style="list-style-type: none"> ○ No deep hole blasting envisaged. ○ Small dia shot holes are used for breaking boulders. ○ Specific charge pattern has to be designed by proper trial vibration studies with varying charge ratios. ○ If the vibration still exceeds the limit a long Trench to a depth of 6m may cut in the

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			<p>direction of wave's movement to break longitudinal waves which travel close to surface, preferably near mine buffer zone</p> <ul style="list-style-type: none"> ○ In spite of all measures periodical testing of vibration and noise using approved seismograph by DGMS has to be followed as a part of Environmental monitoring
5	Soil Environment	Topsoil	<ul style="list-style-type: none"> ○ Humus top soil shall be preserved for reuse in afforestation and agriculture ○ Top soil should not be mixed with other waste or reject materials. It should be conserved by judicious utilization in the mine premises ○ Garland drains will be provided around the mine and dumps to arrest any soil from the mine area being carried away by the rain water. This will also avoid the soil erosion and siltation in the mining pits and maintaining the stability of the benches
6	Waste Dump	Stabilization of Dumps	<ul style="list-style-type: none"> ○ The rejects\ waste dump shall be properly terraced in to 1.5m benches with proper repose angle and then the top soil shall be spread over the dumps and slope to make them humus for some time, after the soil suitable for water retention trees will be planted at the top, slope and toe of the stabilized dumps to form vegetation. ○ Garland drainage around dump shall prevent under wash of dump by hydrostatic pressure to be developed by surface water and control wash outs and collapse ○ Dump should be terraced for every 5m height and stabilized
7	Plantation	Mine lease boundary and waste dump	<ul style="list-style-type: none"> ○ Provision of green belt all along the periphery of the lease area for control of dust and to attenuate noise ○ Stabilization of Dump with plantation

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			<ul style="list-style-type: none"> ○ It is strongly recommended that the loss of plant in each year will be counted and again planted in subsequent plantation. ○ The plant should be planted taken from nursery, where the survival rate is high.
8	Land Environment		<ul style="list-style-type: none"> ○ The restoration of the degraded land would cover backfilling and terracing with the overburden / wastes and surfacing the same with top soil. ○ Provision of Garland drainage around the dumps ○ Fast growing trees and other native shrubs would be planted to stabilize the reclaimed land ○ Appropriate measures will be taken for Green belt development. ○ The rain water will be stored in the pit which will recharge the ground water as a part of rain water harvesting scheme for irrigating the nearby agricultural lands.
9	Socio Economic		<ul style="list-style-type: none"> ○ Good maintenance practices will be adopted for 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. ○ Drilling, blasting etc at specified location will be followed with proper schedule. ○ Appropriate air pollution control measure will be taken so as to minimize the environmental impact within the core zone. ○ An emergency preparedness plan will be prepared in advance, to deal with fire fighting, evacuation and local communication. ○ For the safety of workers, personal protective appliances like hand gloves,

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		<p>helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices has been provided which meet 'BIS' (Bureau of Indian Standards).</p> <ul style="list-style-type: none"> ○ As a part of CSR activities, community welfare activities will be undertaken by the proponent which leads to socio economic development
10	Occupational Health	<ul style="list-style-type: none"> ○ First-aid facilities as per provisions under Rule (44) of Mines Rules 1955 ○ Initial and Periodical medical examination shall be conducted for the employees under Rule 29B & 45 (A). ○ Insurance will be taken in the name of the labourers working in the mines ○ Workers involved in mining work shall be provided protective equipments such as Thick Gloves, Goggles, ear plugs, safety boot wears, etc...

1.6 Analysis of Alternatives

The quarrying site is dependent on the geology and mineral deposition of the area. Hence, this project is, mineral and site specific and no alternative site considered for this project.

1.7 Environmental Monitoring Program

Success of any environmental management programme depends upon the efficiency of the organizational set up responsible for the implementation of the programme. Regular monitoring of the various environmental parameters is also necessary to evaluate the effectiveness of the management programme. Environmental Monitoring Programme will be conducted for various environmental components as per conditions stipulated in the Environmental Clearance Letter issued by SEIAA & Consent to Operate issued by TNPCB.

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Table No: 1.11 Post Project Environmental Monitoring Program

S. No.	Environment Attributes	Location	Monitoring		Remarks
			Duration	Frequency	
1	Meteorology and Air Quality	Continuous monitoring weather station in core zone/ nearest IMD station	24 hours	Monthly Once	Wind speed, direction, Temperature, Relative humidity and Rainfall.
2	Air Pollution Monitoring – PM _{2.5} , PM ₁₀ , SO ₂ and NO _x	6 locations (One station in the core zone and at least one in nearby residential, area, one in the upwind, two station on the downwind direction and one in cross wind Direction).	8 hours	Six Month Once	Fine Dust Sampler and Respirable Dust Sampler
3	Water Pollution Monitoring	Mine effluents, Set of grab samples during pre and post monsoon for ground and surface water in the vicinity.	–	Six Month Once	Physico–chemical, microbiological characteristics
4	Hydrogeology	Water level in open wells in buffer zone around 1kmat specific wells	-	Once in 6months	Water level monitoring devices may be used
5	Noise	Mine Boundary, High noise generating areas within the lease and at the nearest residential area	24 hours	Monthly Once	Sound level meter

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6	Vibration	At the nearest habitation (in case of reporting)	–	During blasting operation	Digital Seismograph
7	Soil	Core Zone and Buffer zone (Grab samples)	–	Six Month Once	Physical and Chemical characteristics

1.8 Project Benefits

The proponents, **Thiru. A. Ammasaiappan S/o. Arasey Gounder, Tmt. S. Selvamani w/o Subramaniyan, Tvl. Sri Vetri Velavan Blue Metals** and **Tmt. M.Sarojini** are very much conscious of his obligations to society at large. Under plantation programme, it is suggested to develop green belt further all along the boundary of the quarry lease area. Apart from the green belts and aesthetic plantation for eliminating fugitive emissions and noise control, all other massive plantation efforts will be executed with the assistance of experts and cooperation of the local community. The quarrying activity will create rural employment. In addition there will be indirect employment to many more people in the form of contractual jobs like construction of infrastructural facilities, transportation of Rough Stone and gravel to destinations, sanitation, supply of goods and services to the quarry and other community services etc. The local population will have preference to get an employment. The proponent will help in socio economic development of the village by providing educational facilities to children, and welfare amenities like drinking water to school; road and medical facilities to villages and employment opportunities to nearby villagers. CSR budget is allocated as 2.5% of the profit.

1.9 Environmental Management Plan

The Environmental Management Plan (EMP) must be integrated into the process of quarry planning so that the ecological balance of the area is well maintained and adverse effects are minimized. EMP includes all preventive as well as mitigation measures to minimize the impacts on the environment. The Quarry Plan is for the production of Rough Stone without deep hole drilling and heavy blasting. Only controlled blasting is undertaken. Such limited quarrying activity is not likely to cause any impact adversely on the environment as far as pollution of air, water, land and noise is concerned.

2.0 Conclusion

As discussed, it is safe to mention that the project is not likely to cause significant impacts on the ecology and environment of the area, as adequate preventive measures will be adopted to contain the pollutants within permissible limits. The total operations shall be carried out with ease & minimum risk to the workers. The proposed Environmental Management Plan will keep the area in a safe environment with negligible impact on the environment. Plantation will substantiate the impact due to the quarrying activity. Quarrying activity will help in improving the socio-economic benefits in areas like employment, communication and infrastructure development.