

# EXECUTIVE SUMMARY OF DRAFT EIA

## FOR

**M/s. SRI GANESHMURUGAN BLUE METALS ROUGH STONE  
QUARRY PROJECT**

**At**

**Karudayampalayam Village, Pugalur Taluk,  
Karur District, Tamil Nadu State.**

**S.F. No. 293/1(part),293/3(part), 293/4(Part),294/2B, 295/1(Part)**

**Extent: 4.36.50 ha**

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

**Cluster Extent = 18.24.0 ha**

**Complied as per ToR Obtained vide**

**Letter No. SEIAA-TN/F.No.9561/SEAC/ToR-1358/Dated 10.02.2023**

**NAME OF PROPOSED PROJECT PROPONENT**

**M/s. Sri Ganeshmurugan Blue Metals,  
S.F.No.268,  
Pudukanalli, Pugalur Taluk,  
Karur District-639002.**

**ENVIRONMENTAL CONSULTANT**

**GEO TECHNICAL MINING SOLUTIONS**



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**NABET ACC. NO: NABET/EIA/2124/SA 0184**

**Valid till : Dec 31, 2023**

**Baseline Study Period – October 2022 to December 2022**

## CHAPTER I INTRODUCTION

As the proposed rough stone and gravel mining project, known as P1 falls within the 500 m radius cluster of quarries with the total extent of >5 ha (i.e., **18.24.00 ha**), it is classified under category “B1” and requires submission of EIA report for grant of Environmental Clearance (EC) after conducting public hearing. The cluster contains only two proposed projects, known as P1 and P2. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269 (E) Dated 1<sup>st</sup> July 2016, as shown in Figure 1.1.

This EIA draft discusses the cumulative impacts of 2 proposed projects in a cluster on the environment and provides a detailed Environmental Management Plan (EMP) to minimize the adverse impacts of those projects situated in the cluster falling in Karudayampalayam Village, Pugalur Taluk, Karur District and Tamil Nadu State. In compliance with ToR obtained vide Letter No. SEIAA-TN/F.No.9561/SEAC/ToR-1358/Dated 10.02.2023, this EIA report has been prepared for the project proponent, M/s. Sri Ganeshmurugan Blue Metals applied for rough stone and gravel quarry lease in the Patta land falling in S.F.No.293/1(Part), 293/3(Part), 293/4(Part), 294/2B & 295/1(Part) over an extent of 4.36.5 ha in Karudayampalayam Village, Pugalur Taluk, Karur District and Tamil Nadu. This EIA report takes into account the rough stone quarries within the cluster of 500 m radius from the periphery of the proposed project site. The cluster contains two proposed projects, known as P1, P2 and One Existing project, known as E1 and Two Expired projects known as EX1 and EX2. All the projects mentioned above have been taken for cluster extent calculation as per MoEF & CC Notification S.O. 2269(E) Dated 1<sup>st</sup> July 2016. The total extent of all the quarries is 18.24.00 ha, also known as the cluster extent. The quarries involved in the calculation of cluster extent are shown in Figure 1.1.

**Table 1.1 Details of Project Proponent**

<b>Name of the Project Proponent</b>	<b>M/s. Sri Ganeshmurugan Blue Metals</b>
Address	S.F.No.268, Pudukanalli, Pugalur Taluk, Karur District-639002.
Status	Proprietor

**Table 1.2 Details of Quarries within the Cluster Area of 500 m Radius**

<b>Proposed Quarries</b>				
<b>Code</b>	<b>Name of the Owner</b>	<b>S.F. No/ Village</b>	<b>Extent (ha)</b>	<b>Status</b>
<b>P1</b>	M/s. Sri Ganeshmurugan Blue Metals	293/1(part),293/3(part) 293/4(Part),294/2B 295/1(Part) Karudayampalayam	4.36.50	Proposed Area
<b>P2</b>	Tvl.Ram Blue Metals	289/1,290/1B,290/2 Karudayampalayam	1.23.00	Applied Area
<b>Existing Quarry</b>				
<b>E1</b>	Tvl.Ganesh Murugan Blue Metals	273/A3,273/A3,273/A5, 273/A2,273/A6,274/1, 274/5 Karudayampalayam	4.98.0	26.11.2018 to 25.11.2023
<b>Expired Quarries</b>				
<b>EX1</b>	Sri Ganesh Murugan Blue Metals	892 Karudayampalayam	3.03.5	14.10.2016- 13.10.2021
<b>EX2</b>	Tvl.Ram Blue Metals	289/2,290/1A	4.63.0	23.10.2017 to 22.10.2022
<b>Total Cluster Extent</b>			<b>18.24.00</b>	---

**Source:**

*DD Letter - Rc.No.332/Mines/2022, Dated:07.11.2022.*

*DD Letter- Rc.No.293/Mines/2021, Dated:01.04.2022.*

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

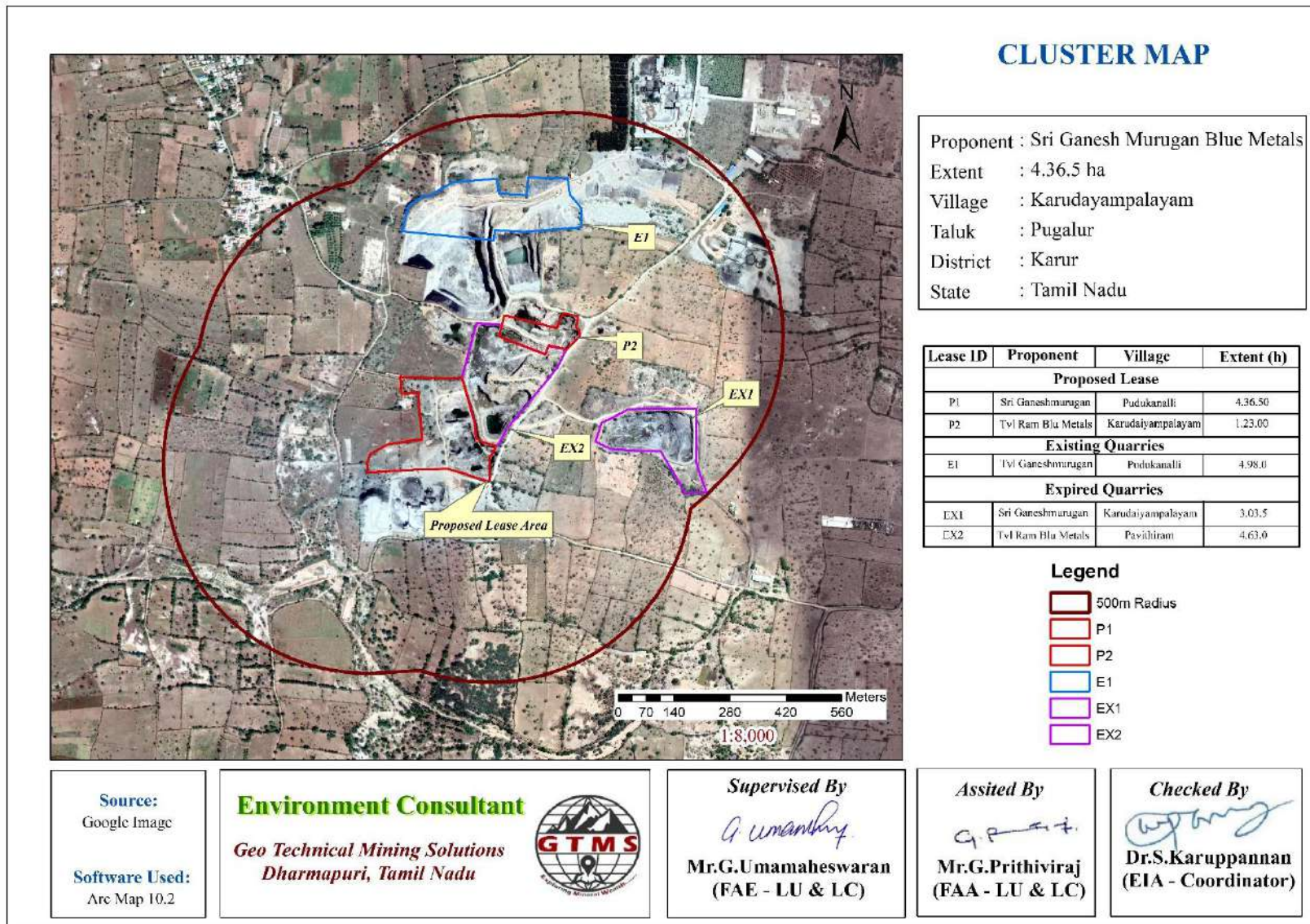


Figure 1.1 Google earth image showing 500m radius limits and the proposed project and existing quarries within the limit

## **CHAPTER II**

### **PROJECT DESCRIPTION**

The proposed project deals with excavation of rough stone and gravel which is primarily used in construction projects. The method adopted for rough stone and gravel excavation is an open cast semi-mechanized mining method involving drilling, blasting and formation of benches with 5 m height and 5 m width and secondary blasting. The proposed project area is located between latitudes from 10°56'38.60"N to 10°56'47.10"N and Longitudes from 77°57'59.49"E to 77°58'9.97"E in Karudayampalayam Village, Pugalur Taluk, Karur District. The project site is a Patta land with the extent of 4.36.5 ha owned by the project proponent. The proponent had applied for quarry lease on 15.07.2022 to extract rough stone and gravel and obtained the precise area communication letter issued by Department of Geology and Mining, Karur vide Rc.No.332/Mines/2022, dated:19.10.2022. Based on the precise area communication letter, mining plan was prepared. The mining plan thus prepared was approved by Deputy Director of Geology and Mining, Karur (Rc.No.332/Mines/2022, dated:07.11.2022).

According to the approved mining plan, about 507019 m<sup>3</sup> of rough stone and about 4118 m<sup>3</sup> of gravel will be mined up to the depth of 44 m BGL in the first five years. To achieve the estimated production, 4 jack hammers, 1 compressor, 1 excavator with bucket/rock breaker, and 8 tippers will be deployed. To operate the machineries and to break the rough stone to preferred dimension, about 14 persons will be employed. At the end of the quarry life, the dimension of the ultimate pit will be 48 m\*246 m\*44 m and about about 2.20.74 ha of land is used for quarrying; about 2.04.76 ha of land is unutilized. Whereas, at the end of the mine life, about 3.52.0 ha of land will have been quarried; about 0.62.24 ha of land will be used for green belt development and the rest will be used for road and infrastructures.

The final mine closure plan shows that about Rs. 1484100 with the annual recurring cost of Rs. 130950 will be spent towards mine closure. Boundary coordinates of corner pillars of the project site and accessibility details to the location of the project site are given in Tables 2.1 & 2.2, respectively. The lease area of the project site overlaid on Google earth image is shown in Figure 2.1.

**Table 2.1 Corner Geographic Coordinates of Proposed Project**

Pillar ID	Latitude	Longitude	Pillar ID	Latitude	Longitude
1	10°56'47.03''N	77°58'7.21''E	13	10°56'39.33''N	77°57'59.61''E
2	10°56'43.23''N	77°58'8.31''E	14	10°56'40.10''N	77°57'59.49''E
3	10°56'42.14''N	77°58'8.37''E	15	10°56'40.81''N	77°57'59.79''E
4	10°56'41.87''N	77°58'8.73''E	16	10°56'41.59''N	77°58'1.09''E
5	10°56'41.48''N	77°58'9.97''E	17	10°56'41.78''N	77°58'2.09''E
6	10°56'40.72''N	77°58'9.61''E	18	10°56'42.00''N	77°58'3.53''E
7	10°56'40.58''N	77°58'9.48''E	19	10°56'42.02''N	77°58'4.00''E
8	10°56'38.60''N	77°58'9.45''E	20	10°56'45.86''N	77°58'3.64''E
9	10°56'39.21''N	77°58'7.52''E	21	10°56'45.76''N	77°58'2.29''E
10	10°56'39.63''N	77°58'6.05''E	22	10°56'47.10''N	77°58'2.21''E
11	10°56'39.62''N	77°58'5.57''E	23	10°56'46.98''N	77°58'6.13''E
12	10°56'39.56''N	77°58'3.53''E	-	-	-

**Table 2.2 Site Connectivity to the Project Area**

Nearest Roadways	SH-21 Dharapuram-Karur Road	3.5 km SE
	NH-67 Karur-Coimbatore	1.21 km N
Nearest Town	K.Paramathi	6.60 km NW
Nearest Railway Station	Moorthipalayam	10.35 km NE
Nearest Airport	Tiruchirappalli	84.0 km E
Nearest Seaport	Tuticorin	236.0 km S

### 2.3 DETAILS OF RESERVES

Reserves were calculated using cross-section method after leaving the safety distance as shown in Figure 2.2. Details of resources and reserves of the project are given in Table 2.3.

**Table 2.3 Estimated Resources and Reserves of the Project**

Resource Type	Rough Stone in m <sup>3</sup>	Gravel in m <sup>3</sup>
Geological Resource in m <sup>3</sup>	1804625	12824
Mineable Reserves in m <sup>3</sup>	507019	4118
Proposed production for 5 years m <sup>3</sup>	507019	4118

Based on the year wise development and production plan and sections, as shown in Figures 2.3 & 2.3a, the year wise production results are given in Table 2.4.

**Table 2.4 Year-Wise Production Details**

Year	Rough Stone in (m <sup>3</sup> )	Gravel in (m <sup>3</sup> )
I	108951	1830
II	108743	2288
III	124890	---
IV	125065	---
V	39370	---
<b>Total</b>	<b>507019</b>	<b>4118</b>

**2.3 LAND USE PATTERN**

Land use and land cover information for the proposed project site has been given in Table 2.5.

**Table 2.5 Land use data at present, during scheme of mining, and at the end of mine life**

Description	Present Area (ha)	Area at the end of life of quarry (ha)
Area under quarry	2.20.74	3.52.0
Infrastructure	Nil	0.02.0
Roads	0.03.0	0.03.0
Green Belt & Dump	0.08.0	0.62.24
Drainage & Settling Tank	Nil	0.11.76
Unutilized area	2.04.76	0.05.5
<b>Total</b>	<b>4.36.5</b>	<b>4.36.5</b>

Source: Approved mining plan

**2.4 METHOD OF MINING**

The quarrying operation is proposed to be carried out by opencast semi mechanized mining method involving drilling, blasting, and formation of benches. Machineries proposed for this project have been given in Table 2.6.

**2.5 PROPOSED MACHINERY DEPLOYMENT**

List of machineries proposed for the quarrying operation is given in Table 2.6.

**Table 2.6 Proposed Machinery Deployments**

S. No.	Type	No of Unit	Capacity	Make	Motive Power
1	Jack Hammers	4	Hand held	-	Diesel Drive
2	Compressor	1	Air	-	Diesel Drive
3	Excavator	1	-	-	Diesel Drive
<b>Haulage &amp; Transport Equipment</b>					
4	Tipper	8	-	-	Diesel Drive



**Table 2.7 Conceptual Blasting Design**

Blasthole Diameter (D) in mm	32
Burden (B) in m	1
Spacing (S) in m	0.97
Subdrill in m	0.3
Charge length (C) in m	0.64
Stemming	1
Hole Length (L) in m	1.9
Bench Height (BH) in m	1.6
Mass of explosive/hole in g	400
Stemming material size in mm	3.2
Burden stiffness ratio	1.64
Blast volume/hole in m <sup>3</sup>	1.59
Production of rough stone/day in m <sup>3</sup>	376
Number of blastholes/day	236
Blasthole pattern	Staggered/Rectangular
Mass of explosive /day in kg	94
Powder factor in kg/m <sup>3</sup>	0.25
Loading density	0.63
Type of explosives	Slurry
Diameter of packaging in mm	25
Initiation system	NONEL
Fly rock distance in m	23

**Table 2.8 Fuel Requirement Details**

<b>Fuel Requirement for Excavator</b>			
<b>Details</b>	<b>Rough Stone (507019 m<sup>3</sup>)</b>	<b>Gravel (4118 m<sup>3</sup>)</b>	<b>Total Diesel (litre)</b>
Average Rate of Fuel Consumption (l/hr)	16	10	---
Working Capacity (m <sup>3</sup> /hr)	20	60	---
Time Required (hours)	25351	69	---
Total Diesel Consumption for 5 years (litre)	405615	686	406301



<b>Fuel Requirement for Compressor</b>			
Average Rate of Fuel Consumption/hole (litre)	0.4	---	---
Number of Drillholes/day	236	---	---
Total Diesel Consumption for 5 years (litre)	127440	---	127440
<b>Fuel Requirement for Tipper</b>			
Average Rate of Fuel Consumption/Trip (litre)	20	20	---
Carrying Capacity in m <sup>3</sup>	6	6	---
Number of Trips / days	63	1	---
Number of Trips / 5 years	84503	686	---
Total Diesel Consumption for 5 years (litre)	1690063	13727	1703790
<b>Total Diesel Consumption by Excavator, Compressor and Tipper</b>			<b>2237532</b>

**Table 2.9 Capital Requirement Details**

<b>S. No.</b>	<b>Description</b>	<b>Cost (Rs.)</b>
1	Fixed Asset Cost	19,49,975
2	Machinery cost	30,00,000
3	EMP Cost	25,22,400
<b>Total Project Cost</b>		<b>74,72,375/-</b>

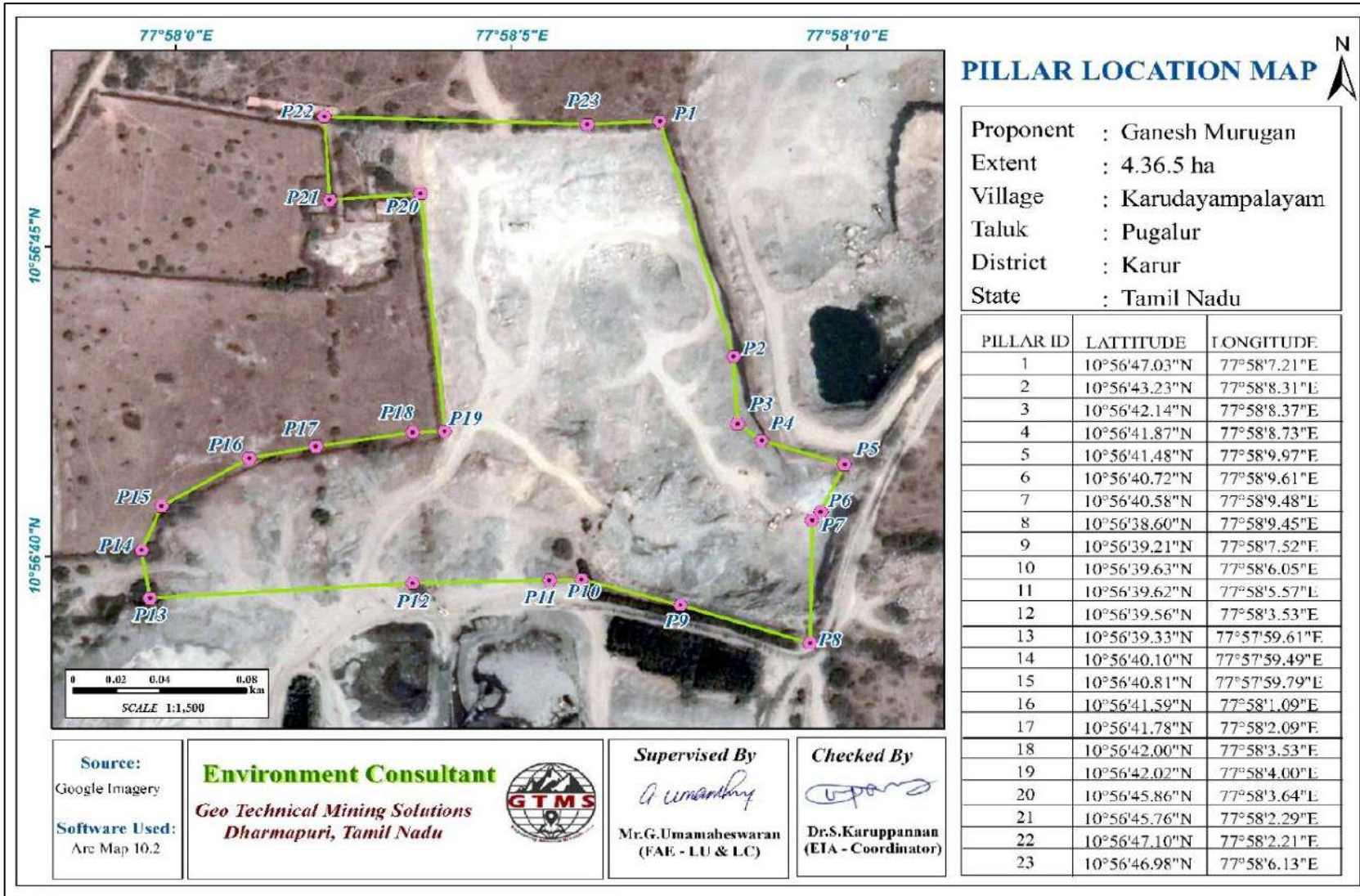


Figure 2.1 Google Earth Image Showing Lease Area with Pillars

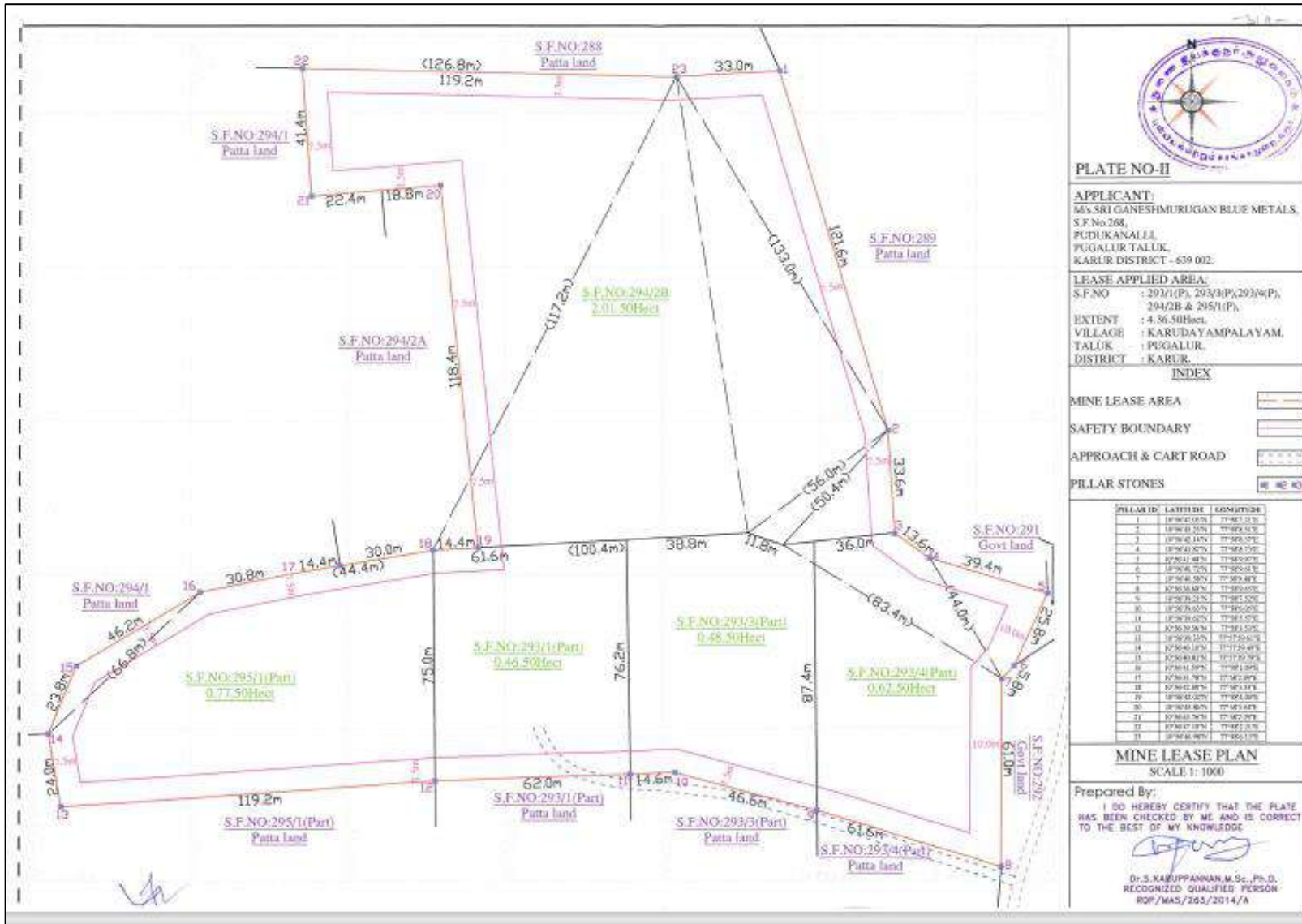


Figure 2.2 Mine Lease Plan



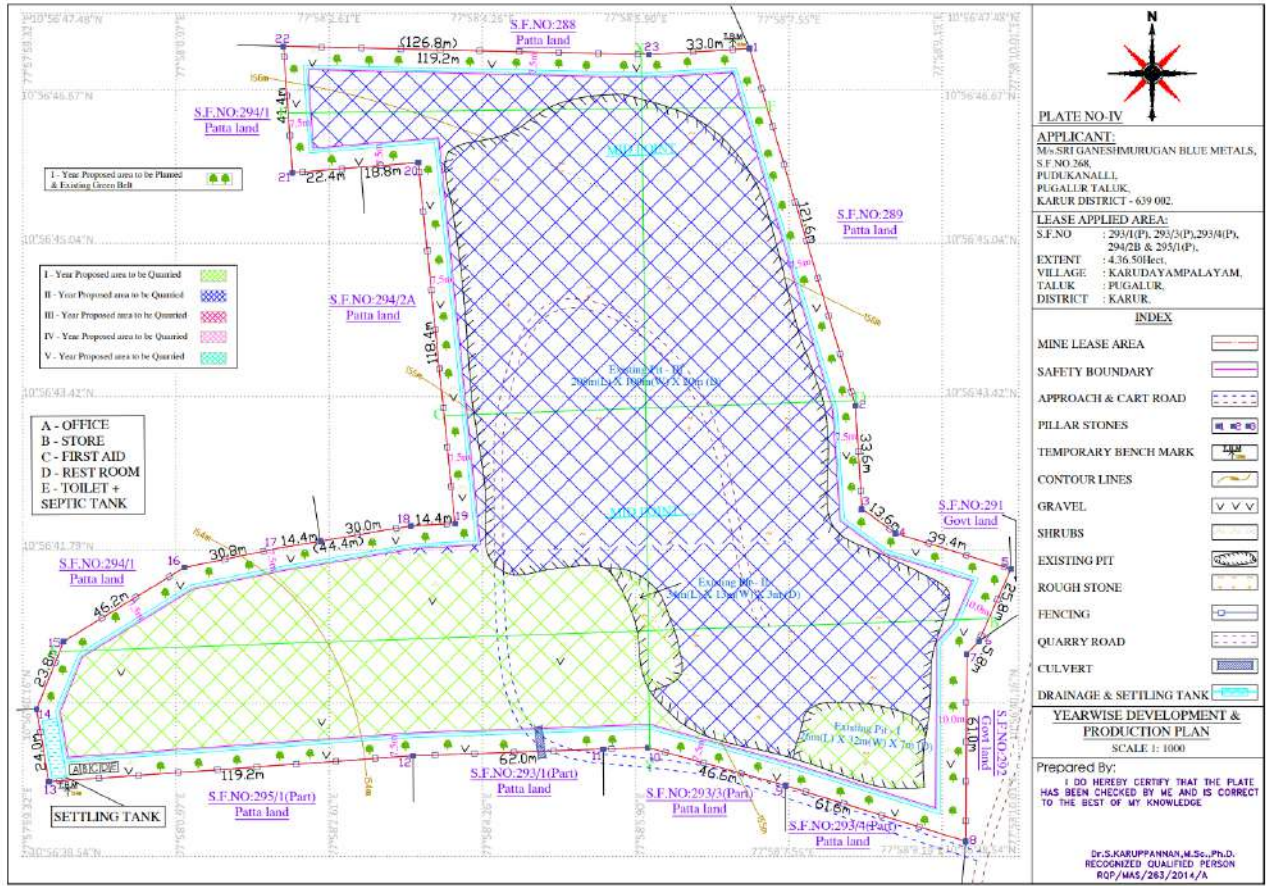


Figure 2.3 Yearwise development and production plan

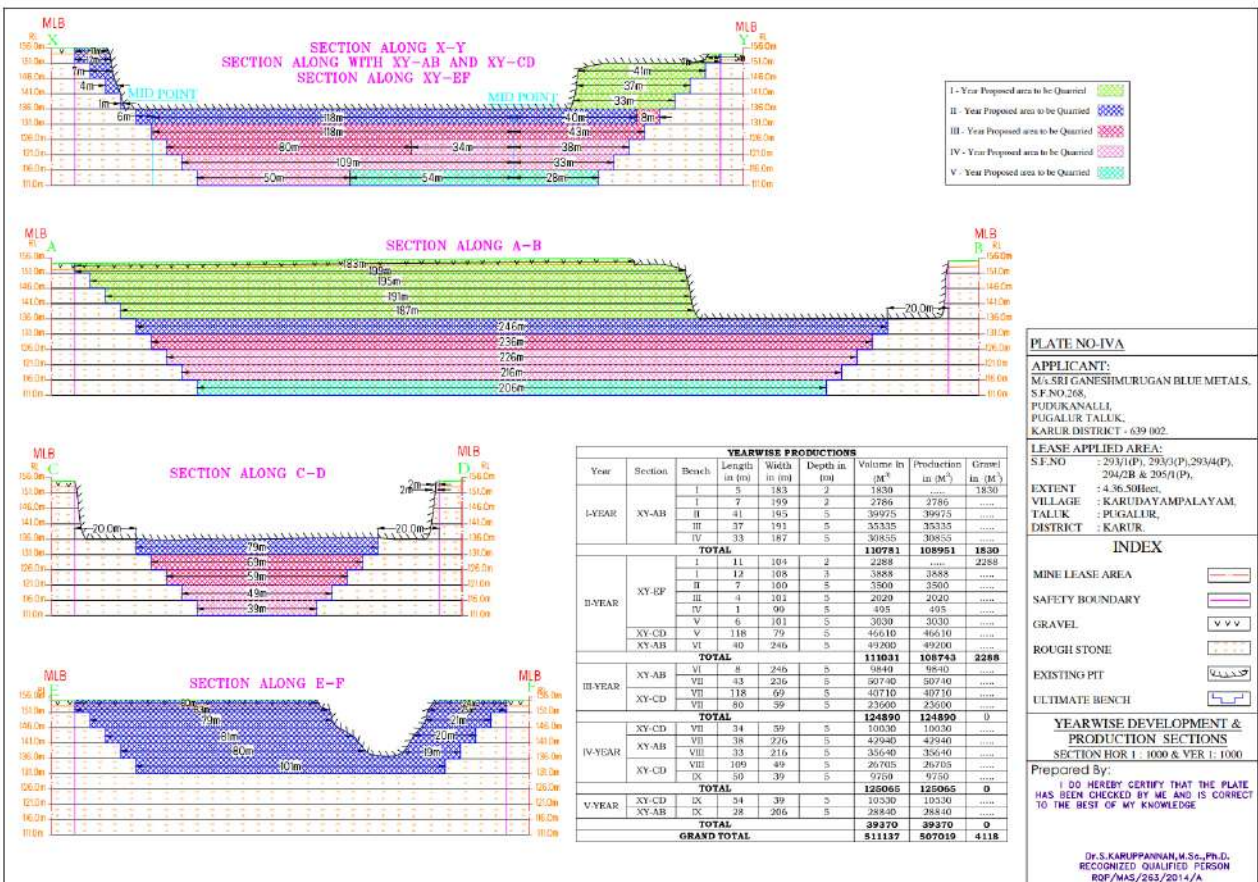


Figure 2.3a Yearwise Development and Production Plan Sections

## 2.5 CONCEPTUAL MINE CLOSURE PLAN

- ❖ Mine closure is a process of returning a disturbed site to its natural state for other productive uses to minimize adverse effects on the environment or threats to humans' health and safety.
- ❖ The objective of the mine closure plan is to transform quarries to be physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting, and non-contaminating.
- ❖ At the end of mining life, the mine pit will act as an artificial reservoir for collecting rain water and will help to meet the water demand during drought season.
- ❖ After mine closure, the greenbelt will be developed along the safety barrier and over top benches. Water from the pit will be used to the greenbelt development and maintenance. Budgetary provision for mine closure is provided in Table 2.7.

**Table 2.7 Mine Closure Budget**

<b>Activity</b>	<b>Capital Cost</b>	<b>Recurring Cost/Annum</b>
873 plants inside the lease area	174600	26190
1310 plants outside the lease area	392850	39285
Wire Fencing (4.36.5 ha)	873000	43650
Renovation of Garland Drain (4.36.5 ha)	43650	21825
<b>Total</b>	<b>1484100</b>	<b>130950</b>

**CHAPTER III**  
**DESCRIPTION OF THE ENVIRONMENT**

**3.0 INTRODUCTION**

Field monitoring studies were carried out to evaluate the existing environmental condition of the project site during October through December, 2022 as per CPCB guidelines. Environmental baseline data were collected by an NABL accredited and MoEF notified Excellence Laboratory for the environmental attributes including soil, water, noise, air and by FAEs for ecology and biodiversity, traffic, and socio-economy.

**3.1 LAND ENVIRONMENT**

Land use pattern of the area of 5 km radius was studied using Sentinel II imagery. LULC types and their extent are given in Table 3.1.

**Table 3.1 Land Use / Land Cover Statistics for the Area of 5 km Radius**

<b>S. No.</b>	<b>Classification</b>	<b>Area (ha)</b>	<b>Area (%)</b>
1	Crop land	7257.2	92.3
2	Dense Forest	3.09	0.03
3	Land with or without scrub	156.3	1.9
4	Mining / Industrial wastelands	139.6	1.8
5	Plantations	247.1	3.1
6	Water bodies	52.8	0.7
<b>Total</b>		<b>7856.10</b>	<b>100</b>

*Source: Sentinel II Satellite Imagery*

**3.2 SOIL ENVIRONMENT**

nine locations were selected for soil sampling based on soil types, vegetative cover, and industrial & residential activities including infrastructure facilities. The physical and chemical characteristic results of soil samples are provided below.

***Physical Characteristics***

The soil samples in the study area show loamy textures varying between sandy loam, silty loam and silty clay. pH of the soil varies from 6.5 to 7.9 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 173 to 340  $\mu\text{s}/\text{cm}$ . Bulk density ranges between 1.3 and 9.8  $\text{g}/\text{cm}^3$ .

### ***Chemical Characteristics***

Nitrogen ranges between 0.02 and 0.08 %. Phosphate ranges between 0.14 and 1.7 %. Potassium ranges between 0.09 and 0.43 %. Calcium ranges between 376 and 573 mg/kg. Organic matter content ranges between 1.2 and 9.5 %.

## **3.3 WATER ENVIRONMENT**

### ***Surface Water***

Amaravathi River and Thathampalayam Lake are the two prominent surface water resources present in the study area. These are ephemeral in nature, which convey water only after rainfall events. The proposed project area is located 4.51 km SE of Amaravathi River and 3.04 km SE of Thathampalayam Lake, as shown in Table 3.5 and Figure 3.4. Two surface water samples, known as SW1 and SW2 were collected from the two surface water bodies to assess the baseline water quality. Table 3.6 summarizes surface water quality data of the two samples. Results for surface water samples in the Table 3.6 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

### ***Ground Water Resources***

Groundwater in the study area occurs in the crystalline rocks of Archaean age and Recent alluvium. The movement of the groundwater is controlled by the intensity of weathering and fracturing of crystalline rocks. Dug wells and bore wells are the most common ground water abstraction structures in the area. However, in dry season, people in the study area heavily rely on bore wells for their domestic and agriculture purpose.

Seven groundwater samples, known as BW1, BW2, BW3, BW4, BW5, BW6, and BW7 were collected from bore wells and analyzed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Ground water sampling locations and their distance and direction from the lease area are provided in Table 3.5 and the spatial occurrence of water sampling locations is shown in Figure 3.4. Table 3.6 summarizes ground water quality data of the seven samples.

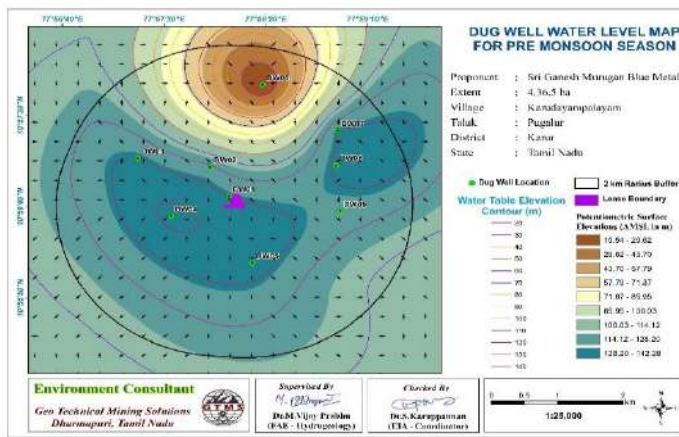
Results for ground water samples in the Table 3.6 indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

### ***Groundwater Levels and Flow Direction***

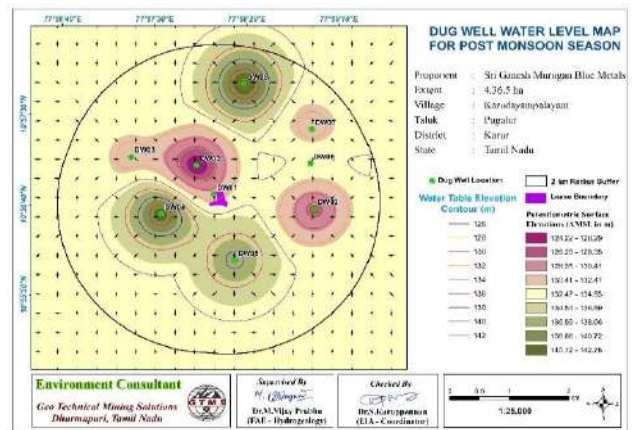
Data regarding groundwater elevations were collected from 9 open wells and 9 bore wells at various locations within 2 km radius around the proposed project sites for the period



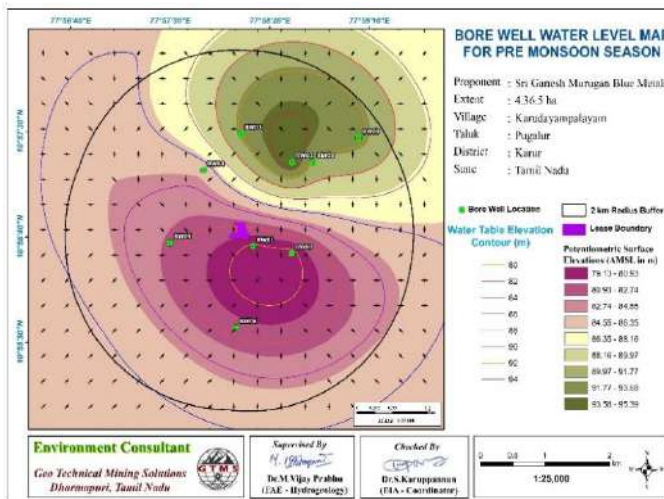
from April through June, 2022 (Pre-Monsoon Season) and from October through December, 2022 (Post Monsoon Season). Average depths to the static water table in open wells range from 19.6 to 22.7 m BGL in post monsoon and from 20.6 to 23.5 m BGL in pre monsoon. The bore well data thus collected onsite are provided in Tables 3.9 and 3.10. The average depths to static potentiometric surface in bore wells for the period of October through December 2022 (Post-Monsoon Season) vary from 66.3 to 69.5 m and from 72.5 to 68.5 m for the period of March through May, 2022 (Pre-Monsoon Season). The groundwater flow studies indicate that in the two monsoon seasons groundwater flows towards the bore well number 1 located in southern direction of the proposed project site.



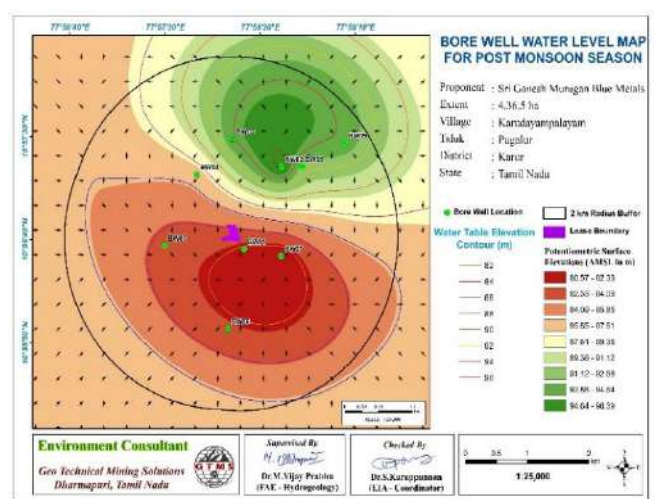
**Figure 3.1 Open well static groundwater elevation map showing the direction of groundwater flow during pre-monsoon season**



**Figure 3.2 Open well static groundwater elevation map showing the direction of groundwater flow during post-monsoon season**



**Figure 3.3 Borewell static groundwater elevation map showing the direction of groundwater flow during pre-monsoon season**



**Figure 3.4 Borewell static groundwater elevation map showing the direction of groundwater flow during post-monsoon season**

### **3.4 AIR ENVIRONMENT**

The existing ambient air quality of the area is important for evaluating the impact of mining activities on the ambient air quality. The baseline studies on air environment include identification of specific air pollutants and their existing levels in ambient air. The ambient air quality in the study area of 5 km radius around the proposed quarry sites provides the baseline ambient air quality information.

#### ***Ambient Air Quality***

As per the monitoring data, PM<sub>10</sub> ranges from 48.30 µg/m<sup>3</sup> to 36.50µg/m<sup>3</sup>; PM<sub>2.5</sub> from 26.60µg/m<sup>3</sup> to 18.90 µg/m<sup>3</sup>; SO<sub>2</sub> from 11.40 µg/m<sup>3</sup> to 7.90 µg/m<sup>3</sup>; NO<sub>2</sub> from 22.20 µg/m<sup>3</sup> to 15.70µg/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

### **3.5 NOISE ENVIRONMENT**

42.5 dB (A) Leq during day time and 32.8 dB (A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 35.8 to 43.8dB (A) Leq and during night time from 26.5 to 40.1dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

### **3.6 BIOLOGICAL ENVIRONMENT**

The main objective of biological study is to collect the baseline data regarding flora and fauna in the study area and identify ecologically sensitive areas and whether there are any rare, endangered, endemic or threatened (REET) species of flora and fauna in the core zone as well as buffer zone. From the study of biological environment, it is concluded that there was no schedule I species of animals observed within study area as per Wildlife Protection Act, 1972 and no species were found in vulnerable, endangered or threatened category as per IUCN and that there is no endangered red list species found in the study area.

### **3.7 SOCIO ECONOMIC ENVIRONMENT**

Socio-economic study is an essential part of environmental study. It is a measure of an individual's or family's or group of people's economic and social position based on education, income, health, and occupation. Socio-economic most important determinant of livelihoods as levels of knowledge, skill and income conditions which mean for their living. The study found that a part of population is suffering from lack of permanent job to run their day-to-day life. Their expectation is to earn some income for their sustainability on a long-term basis. The proposed project will aim to provide preferential employment to the local people there by improving the employment opportunity in the area, which will in turn improve the social standards.

### 3.8 TRAFFIC DENSITY

**Table 3.2 Traffic Survey Locations**

Station Code	Road Name	Distance and Direction	Type of Road
TS1	Village road	0.1 km	Village road
TS2	Dharapuram-Karur (SH)	3.38 km	Dharapuram-Karur (SH)
TS3	Paramathi-Karur(NH67)	1.21 km	Paramathi-Karur (NH67)

Source: On-site monitoring by GTMS FAE & TM

**Table 3.3 Existing Traffic Volume**

Station code	HMV		LMV		2/3 Wheelers		Total PCU
	No	PCU	No	PCU	No	PCU	
TS1	80	240	44	44	110	55	339
TS2	146	438	54	54	127	64	556
TS3	175	525	65	65	144	72	662

Source: On-site monitoring by GTMS FAE & TM

### 3.9 SITE SPECIFIC FEATURES

**Table 3.4 Details of Environmentally Sensitive Ecological Features in the Study Area**

SI. No	Sensitive Ecological Features	Name	Areal Distance in km from cluster
1	National Park /	None	Nil within 10 km radius
	Wild life Sanctuaries	None	Nil within 10 km radius
2	Reserve Forest	Thathampalayam R. F	2.82 km SE
3	Lakes/Reservoirs/	Uppar odai	0.7 km S
	Dams/Streams/Rivers	Amaravati River	4.6 km SE
4	Tiger Reserve/Elephant Reserve/ Biosphere Reserve	None	Nil within 10 km radius
5	Critically Polluted Areas	None	Nil within 10 km radius
6	Mangroves	None	Nil within 10 km radius
7	Mountains/Hills	None	Nil within 10 km radius

8	Notified Archaeological Sites	None	Nil within 10 km radius
9	Industries/ Thermal Power Plants	None	Nil within 10 km radius
10	Defence Installation	None	Nil within 10 km radius

## CHAPTER IV

### ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 4.0 INTRODUCTION

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 for sustainable resource extraction.

#### 4.1 LAND ENVIRONMENT

##### *Anticipated Impact*

- ❖ *Removal of 507019 cubic meters of ordinary stone and 4118 cubic meters of gravel causing permanent damage to mineral resources.*
- ❖ The main anticipated impact on the land environment due to quarrying operation is changes in landscape and land use pattern.
- ❖ The size of lands used for mining is insignificant when compared to the size of other LULCs. This small size of mining activities shall not have any significant impact on the land environment. While speaking the impact of the mining project on groundwater resources, the mining activity will not reach the groundwater aquifers. Therefore, it will not affect groundwater quality and quantity.

##### *Mitigation Measures*

The mining activity will be progressively implemented along with other mitigative measures as discussed below:

- ❖ Garland drains will be constructed all around the quarry pit and a check dam will be constructed at the suitable location in lower elevations to prevent erosion due to surface runoff during heavy rainfall and to collect the storm water for various uses.
- ❖ Green belt will be developed in safety zone. The water stored in the quarry will be used for greenbelt.

- ❖ Thick plantation will be done on unutilized area, top benches, safety barrier, etc.,
- ❖ At conceptual stage, the land use pattern of the quarry will be changed into greenbelt area and temporary reservoir.
- ❖ Natural vegetation surrounding the quarry will be retained to minimize dust emissions.
- ❖ Proper fencing will be established at the conceptual stage and security will be posted round the clock to prevent inherent entry of the public and cattle.

## **4.2 SOIL ENVIRONMENT**

### ***Anticipated Impact***

No top soil is produced during the project operation. However, some of the important common mitigation measures is provided below.

### ***Mitigation Measures***

- ❖ *Run-off diversion* – Garland drains will be constructed all around the project boundary to prevent surface flows from entering the quarry area. The water from garland drainage system 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 ponds trap sediments and reduce suspended sediment loads before runoff is discharged from the quarry sites. Sedimentation ponds will 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.
- ❖ *Retention of vegetation* – Retain existing vegetation or replant the vegetation at the site wherever possible.
- ❖ *Monitoring and maintenance* –Erosion control systems will be maintained to make sure seamless performance of the systems during rainy season.

## **4.3 WATER ENVIRONMENT**

### ***Anticipated Impact***

- ❖ As the proposed project acquires 4.0 KLD of water from water vendors, it will not extract water by developing abstraction structures in the lease area. Therefore, the project will not deplete aquifer beneath the lease area.
- ❖ The impact of mining on the water quality is insignificant because of no use of chemicals or hazardous substances during quarrying process.
- ❖ The quarrying activity will not intersect ground water table as the proposed depth is 44 m below ground level and water table is found at depths of 60 m below ground level.

- ❖ There is no intersection of surface water bodies in the project area.
- ❖ As there is no proposal for rough stone and gravel processing or workshop within the project area there will be no effluent anticipated from the mines.

#### **Mitigation Measures**

- ❖ Rainwater will be collected in the mining pit and the water will be pumped out to surface settling tank of the dimension of 15 m x 10 m x 3 m to remove suspended solids if any. The water stored in the settling tank will be used for dust suppression, greenbelt development and rainwater harvesting.
- ❖ A drainage network, known as garland drains will be constructed to divert surface run-off into the quarrying area.
- ❖ The quality of water in the quarry will be analysed periodically.
- ❖ Domestic sewage from site office and latrines in the mining site will be discharged to septic tanks followed by soak pits.
- ❖ Wastewater from the mining site will be treated in settling tanks before using it for dust suppression and tree plantation purposes.
- ❖ Desilting will be carried out before and immediately after the monsoon season.
- ❖ The quality of water in open and bore wells, and surface water bodies will be monitored regularly.

#### **4.4 AIR ENVIRONMENT**

##### **Anticipated Impact**

Anticipated increase of the air pollutants due to quarrying activities have been predicted using AERMOD software and the results shown in Tables 4.1 to 4.4 will be used in providing mitigation measures.

**Table 4.1 Incremental and Resultant PM<sub>2.5</sub>**

Station ID	Distance to core area (km)	Direction	PM <sub>2.5</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (60 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Base line	Predicted	Total			
AAQ1	--	--	23.1	9.02	32.12	Below standard	39.05	Not significant
AAQ2	0.94	W	19.7	5	24.7		25.38	
AAQ3	3.64	W	23.9	1	24.9		4.18	
AAQ4	4.18	SW	22.0	0.5	22.5		2.27	

AAQ5	2.66	NW	21.0	5	26		23.81	
AAQ6	1.95	SE	19.1	1	20.1		5.24	
AAQ7	3.99	SW	23.7	0.5	24.2		2.11	
AAQ8	3.35	NE	19.9	5	24.9		25.13	
AAQ9	4.30	SSE	19.7	0.5	20.2		2.54	

**Table 4.2 Incremental and Resultant PM<sub>10</sub>**

Station ID	Distance to core area (km)	Direction	PM <sub>10</sub> concentrations( $\mu\text{g}/\text{m}^3$ )			Comparison against air quality standard ( $100 \mu\text{g}/\text{m}^3$ )	Magnitude of change (%)	Significance
			Base line	Predicted	Total			
AAQ1	--	--	45.5	15.2	60.7	Below standard	33.41	Not significant
AAQ2	0.94	W	34.2	10	44.2		29.24	
AAQ3	3.64	W	43.3	5	48.3		11.55	
AAQ4	4.18	SW	41.0	1	42		2.44	
AAQ5	2.66	NW	39.2	5	44.2		12.76	
AAQ6	1.95	SE	37.0	5	42		13.51	
AAQ7	3.99	SW	47.4	0	47.4		0.00	
AAQ8	3.35	NE	36.4	5	41.4		13.74	
AAQ9	4.30	SSE	39.6	1	40.6		2.53	

**Table 4.3 Incremental & Resultant SO<sub>2</sub>**

Station ID	Distance to core area (km)	Direction	SO <sub>2</sub> concentrations( $\mu\text{g}/\text{m}^3$ )			Comparison against air quality standard ( $80 \mu\text{g}/\text{m}^3$ )	Magnitude of change (%)	Significance
			Base line	Predicted	Total			
AAQ1	--	--	9.43	6.56	15.99	Below standard	69.57	Not significant
AAQ2	0.94	W	9.08	5	14.08		55.07	
AAQ3	3.64	W	10.00	0.5	10.5		5.00	
AAQ4	4.18	SW	8.71	0.5	9.21		5.74	
AAQ5	2.66	NW	9.15	5	14.15		54.64	
AAQ6	1.95	SE	9.99	1	10.99		10.01	



AAQ7	3.99	SW	9.03	0.5	9.53		5.54	
AAQ8	3.35	NE	9.14	5	14.14		54.70	
AAQ9	4.30	SSE	6.60	0.5	7.1		7.58	

**Table 4.4 Incremental & Resultant NO<sub>x</sub>**

Station ID	Distance to core area (km)	Direction	NO <sub>x</sub> concentrations(µg/m <sup>3</sup> )			Comparison against air quality standard (80 µg/m <sup>3</sup> )	Magnitude of change (%)	Significance
			Base line	Predicted	Total			
AAQ1	--	--	20.0	7.12	27.12	Below standard	35.60	Not significant
AAQ2	0.94	W	16.8	5	21.8		29.76	
AAQ3	3.64	W	17.9	0.5	18.4		2.79	
AAQ4	4.18	SW	17.8	0.5	18.3		2.81	
AAQ5	2.66	NW	18.2	5	23.2		27.47	
AAQ6	1.95	SE	19.1	1	20.1		5.24	
AAQ7	3.99	SW	18.4	0.5	18.9		2.72	
AAQ8	3.35	NE	17.0	5	22		29.41	
AAQ9	4.30	SSE	22.6	0.5	23.1		2.21	

The values of cumulative concentration i.e., background + incremental concentration of pollutant in all the receptor locations are still within the prescribed NAAQ limits without effective mitigation measures. By adopting suitable mitigation measures, the pollutant levels in the atmosphere can be controlled further.

#### ***Mitigation Measures***

- ❖ Water will be sprinkled on haul roads twice a day to avoid dust generation during transportation.
- ❖ Rough stone and gravel will be properly covered with tarpaulin and transported during the day time.
- ❖ The speed of tippers plying on the haul road will be limited to below 20 km/hr to avoid generation of dust.
- ❖ Main source of gaseous pollution will be from vehicle used for transportation of mineral; therefore, weekly maintenance of vehicles and other machines will be done to improve combustion process and reduce the emission of pollutants.
- ❖ The 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 (Pollution Under Control) certificate.
- ❖ Trees will be planted all along the main haul roads and haul roads will often be levelled to prevent the generation of dust due to movement of tippers.
- ❖ Green belt of adequate width will be developed around the project areas.
- ❖ Dust masks will be provided to the workers and their use will be strictly monitored.
- ❖ Annual medical check-ups, trainings and campaigns will be arranged to create awareness about the importance of wearing dust masks among all mine workers and tipper drivers.
- ❖ Ambient air quality monitoring will be conducted six months once to assess the effectiveness of mitigation measures proposed for the projects.

#### 4.5 NOISE ENVIRONMENT

##### *Anticipated Impact*

**Table 4.5 Predicted Noise Incremental Values**

<b>Noise Monitoring Location</b>	<b>Distance From Project Site(m)</b>	<b>Baseline Noise Level (dBA)m During Day Time</b>	<b>Predicted Noise Level(dBA)</b>	<b>Total(dBA)</b>
Core	100	42.0	57.16	57.29
Pudukkanalli	570	39.8	42.04	44.07
Malapalayampudur	880	37.2	38.27	40.78
Venkadapuram	4180	35.8	24.74	36.13
Karudayampalayam	2680	41.2	28.60	41.43
Thottivadi	3960	36.8	25.21	37.09
Pavithiram	2240	43.8	30.15	43.98
Pallamarudhapatti	2070	40.9	30.84	41.31
Thumbivadi	4280	41.5	24.53	41.59
Nedungur	3470	41.3	26.35	41.44
NAAQ Standards	Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A) Residential Day Time -55 dB (A) & Night Time- 45 dB (A)			

Total noise level in all the sampling areas is well below the CPCB standards for industrial and residential areas. By adopting suitable mitigation measures, the noise levels due to the project can be controlled further.

**Table 4.6 Predicted PPV Values due to Blasting**

Location ID	Maximum Charge in kgs	Nearest Habitation in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	94	570	0.73	23	0.38	146

**Table 4.10 Predicted PPV Values due to Blasting at 100-500 m radius**

Location ID	Maximum Charge in kgs	Radial Distance in m	PPV in mm/s	Fly rock distance in m	Air Blast	
					Pressure (kPa)	Sound Level (dB)
P1	94	100	11.95	23	3.08	164
		200	3.94		1.34	157
		300	2.06		0.82	152
		400	1.30		0.58	149
		500	0.91		0.45	147

The peak particle velocity produced by the charge of 94 kg is well below that of 8 mm/s as per Directorate General of Mines Safety for safe level criteria through Circular No. 7 dated 29/8/1997.

***Mitigation Measures***

- ❖ Proper maintenance, oiling and greasing of machines will be done every week to reduce generation of noise.
- ❖ Sound insulated chambers will be provided for the workers working on machines producing higher levels of noise.
- ❖ Silencers / mufflers will be installed in all machineries.
- ❖ Green belt will be developed around the project area and along the haul roads to minimize propagation of noise.
- ❖ Personal Protective Equipment (PPE) like ear muffs/ear plugs will be provided to the operators of heavy machines and persons working near the heavy machines and their use will be ensured through training and awareness.
- ❖ Regular medical check-up and proper training will be provided to personnel to create awareness about adverse noise level effects.

- ❖ The blasting operations in the cluster quarries are carried out without deep hole drilling and blasting using delay detonators which reduce the ground vibrations
- ❖ Proper quantity of explosives, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting
- ❖ Adequate safe distance from blasting will be maintained as per DGMS guidelines
- ❖ Blasting shelter will be provided as per DGMS guidelines
- ❖ Blasting operations will be carried out only during day time
- ❖ The charge per delay will be minimized and preferably a greater number of delays will be used per blasts
- ❖ During blasting, other activities in the immediate vicinity will be temporarily stopped
- ❖ Drilling parameters like depth, diameter and spacing will be properly designed to give proper blast
- ❖ A fully trained explosives blast man (Mining Mate, Mines Foreman, 2nd Class Mines Manager/ 1st Class Mines Manager) will be appointed
- ❖ Sufficient angular stemming material will be used to confine the explosive force and minimise environmental disturbance caused by venting / misfire
- ❖ The detonators will be connected in a predetermined sequence to ensure that only one charge is detonated at any one time and a NONEL or similar type initiation system will be used
- ❖ The detonation delay sequence shall be designed so as to ensure that firing of the holes is in the direction of free faces so as to minimise vibration effects
- ❖ Appropriate blasting techniques shall be adopted in such a way that the predicted peak particle velocity shall not exceed 0.251 mm/s
- ❖ Vibration monitoring will be carried out every 6 months to check the efficacy of blasting practices.

#### **4.6 BIOLOGICAL ENVIRONMENT**

##### ***Anticipated Impact***

- There shall be negligible air emissions or effluents from the project site. During loading the truck, dust generation will be likely. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly
- Most of the land in the buffer area is undulating terrain with crop lands, grass patches and small shrubs. Hence, there will be no effect on flora of the region.

- Carbon released from quarrying machineries and tippers during quarrying would be 4442 kg per day, 1199317 kg per year and 5996585 kg over five years, as provided in Table 4.8.

**Table 4.8 Carbon Released During Five Years of Rough Stone and Gravel Production**

	<b>Per day</b>	<b>Per year</b>	<b>Per five years</b>
Fuel consumption of excavator	301	81260	406302
Fuel consumption of compressor	94.4	25488	127440
Fuel consumption of tipper	1262	340758	1703790
Total fuel consumption in liters	1657	447506	2237532
CO <sub>2</sub> emission in kg	4442	1199317	5996585

***Mitigation Measures***

- ❖ During conceptual stage, the top bench will be re-vegetated by planting local /native species and lower benches will be converted into rainwater harvesting structure following completion of mining activities, which will replace habitat resources for fauna species in this locality over a longer time.
- ❖ Existing roads will be used; new roads will not be constructed to reduce impact on flora.

***Carbon Sequestration***

- ❖ To mitigate carbon emission due to mining activities, we recommend planting trees around the quarry to offset the carbon emission during quarrying. A tree can sequester 24 kg of carbon per year. Therefore, we recommend planting large number of trees around the quarry and near school campuses, government wasteland, roadsides etc.
- ❖ As per the greenbelt development plan as recommended by SEAC), about 2183 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of about 194 kg of the total carbon, as provided in Table 4.9.

**Table 4.9 CO<sub>2</sub> Sequestration**

CO <sub>2</sub> sequestration in kg	194	52328	261638
Remaining CO <sub>2</sub> not sequestered in kg	4248	1146989	5734946
Trees required for environmental compensation	47791		
Area required for environmental compensation in hectares	96		

## **4.7 SOCIO ECONOMIC ENVIRONMENT**

### ***Anticipated Impact***

- ❖ The project will generate employment for about 14 persons
- ❖ Dust generation from mining activity can have negative impact on the health of the workers and people in the nearby area.
- ❖ Approach roads can be damaged by the movement of tippers

### ***Mitigation Measures***

- ❖ Good maintenance practices will be adopted for plant machinery and equipment to avert potential noise problems.
- ❖ Green belt will be developed in and around the project sites as per Central Pollution Control Board (CPCB) guidelines.
- ❖ Appropriate air pollution control measure will be provided 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 the mines act and rules.
- ❖ Both the State and the Central governments will be benefited through financial revenues by way of royalty, tax, DMF, NMET etc. from the projects directly and indirectly.

## **4.8 OCCUPATIONAL HEALTH MEASURES**

All the persons will undergo pre-employment and periodic medical examination. Employees will be monitored for occupational diseases by conducting the following tests

- ❖ General physical tests
- ❖ Audiometric tests
- ❖ Full chest, X-ray, Lung function tests, Spiro metric tests
- ❖ Periodic medical examination – yearly
- ❖ Lung function test – yearly, those who are exposed to dust
- ❖ Eye test

Essential medicines will be provided at the site. The medicines and other test facilities will be provided at free of cost. The first aid box will be made available at the mine for immediate treatment. First aid training will be imparted to the selected employees regularly. The lists of first aid trained members shall be displayed at strategic places.

## CHAPTER V

### ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

The mineral deposits are site specific in nature; hence question of seeking alternate sites do not arise for the projects.

## CHAPTER VI

### ENVIRONMENT MONITORING PROGRAM

Regular monitoring program of environmental components is essential to take into account the changes in the environmental components as shown in Table 6.1. The Objectives of monitoring is:

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

**Table 6.1 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 (1 SW & 1 GW)	-	Once in 6 months	Parameters specified under IS:10500, 1993 & CPCB Norms
4	Hydrology	Water level in open wells in buffer zone	-	Once in 6 months	Depth in BGL



		around 1 km at specific wells			
5	Noise	2 locations (1Core & 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 6 months	Physical and Chemical Characteristics
8	Greenbelt	Within the Project Area	Daily	Monthly	Maintenance

*Source: Guidance of manual for mining of minerals, February 2010*

## 6.2 BUDGETARY PROVISION FOR EMP

The cost in respect of monitoring of environmental components has been shown in Table 6.2.

**Table 6.2 Environment Monitoring Budget**

S. No.	Parameter	Capital Cost	Recurring Cost per annum
1	Air Quality	-	Rs. 60,000/-
2	Meteorology	-	Rs. 15,000/-
3	Water Quality	-	Rs. 20,000/-
4	Water Level Monitoring		Rs. 10,000/-
5	Soil Quality	-	Rs.20,000/-
6	Noise Quality	-	Rs.10,000/-
7	Vibration Study	-	Rs.1,50,000/-
8	Greenbelt	-	Rs.10,000/-
<b>Total</b>		<b>-</b>	<b>Rs.2,95,000 /-</b>

*Source: Field Data*

## CHAPTER VII

### ADDITIONAL STUDIES

#### 7.1 RISK ASSESSMENT

Risk assessment is all about prevention of accidents and to take necessary steps to prevent it from happening. The methodology for the risk assessment is 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 assess the risk levels of those hazards in order to prioritize those that need an immediate attention. Further, mechanisms responsible for these hazards are identified and control measures are recorded

along with pinpointed responsibilities. The whole quarry operation will be carried out under the direction of a qualified competent mine manager certified by the DGMS, Dhanbad.

## **7.2 DISASTER MANAGEMENT PLAN**

The objective of the disaster management plan is to make use of the combined resources of the mine and the outside services to:

- ❖ Rescue and treat 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**

- The results on the cumulative impact of the two proposed projects on air environment of the cluster do not exceed the permissible limits set by CPCB for air pollutants.
- The cumulative results of noise for the habitation in consideration do not exceed the limit set by CPCB for residential areas for day time.
- PPV resulting from two proposed projects is well below the permissible limit of Peak Particle Velocity of 8 mm/s.
- The two proposed project will allocate Rs.10,00,000/- towards CER as recommended by SEAC.
- The two proposed projects will directly provide jobs to about 35 local people.
- The proposed projects will plant about 2798 saplings in and around the lease area.
- The proposed projects will add 225 PCU per day to the nearby roads.

## **7.4 PLASTIC WASTE MANAGEMENT PLAN**

The Project Proponent shall comply with Tamil Nadu Government Order (Ms) No. 84 Environment and Forest (EC.2) Department Dated: 25.06.2018 regarding ban on one time use and throw away plastics irrespective of thickness with effect from 01.01.2019 under Environment (Protection) Act, 1986.

### ***Objective***

- ❖ To investigate the actual supply chain network of plastic waste.
- ❖ To identify and propose a sustainable plastic waste management by installing bins for collection of recyclables with all the plastic waste

- ❖ Preparation of a system design layout, and necessary modalities for implementation and monitoring.

<b>S. No.</b>	<b>Activity</b>	<b>Responsibility</b>
1	Framing of Layout Design by incorporating provision of the Rules, user fee to be charged from waste generators for plastic waste management, penalties/fines for littering, burning plastic waste or committing any other acts of public nuisance	Mines Manager
2	Enforcing waste generators to practice segregation of bio-degradable, recyclable and domestic hazardous waste	Mines Manager
3	Collection of plastic waste	Mines Foreman
4	Setting up of Material Recovery Facilities	Mines Manager
5	Segregation of Recyclable and Non-Recyclable plastic waste at Material Recovery Facilities	Mines Foreman
6	Channelization of Recyclable Plastic Waste to registered recyclers	Mines Foreman
7	Channelization of Non-Recyclable Plastic Waste for use either in Cement kilns, in Road Construction	Mines Foreman
8	Creating awareness among all the stakeholders about their responsibility	Mines Manager
9	Surprise checking's of littering, open burning of plastic waste or committing any other acts of public nuisance	Mine Owner

## **CHAPTER VIII**

### **PROJECT BENEFITS**

Various benefits are envisaged due to the proposed mine and benefits anticipated from the proposed project to the locality, neighbourhood, region and nation as a whole are:

- ❖ Direct employment to 14 local people
- ❖ Rain water harvesting structures to augment the water availability for irrigation and plantation and ground water recharge
- ❖ Creation of community assets (infrastructure) like school buildings, village roads/ linked roads, dispensary & health Centre, community Centre, market place etc.,
- ❖ Strengthening of existing community facilities through the Community Development Program
- ❖ Skill development & capacity building like vocational training

- ❖ Awareness program and community activities, like health camps, medical aids, sports & cultural activities, plantation etc.,
- ❖ CSR activities mainly contributing to education, health, training of women self-help groups and infrastructure etc., will be taken up in the Karudayampalayam Village. CSR budget is allocated as 2.5% of the profit.
- ❖ Rs. 5,00,000 will be allocated for CER.

## **CHAPTER IX**

### **ENVIRONMENT MANAGEMENT PLAN**

In order to implement the environmental protection measures, an amount of Rs. **2922000** as capital cost and recurring cost as Rs. **2624661** as recurring cost/annum is proposed considering present market price considering present market scenario for the proposed project. After the adjustment of 5% inflation per year, the overall EMP cost for 5 years will be Rs. **17424910**.

## **CHAPTER X**

### **CONCLUSION**

Various aspects of mining activities were considered and related impacts were evaluated. Considering all the possible ways to mitigate the environmental issues, environmental management plan (EMP) 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.

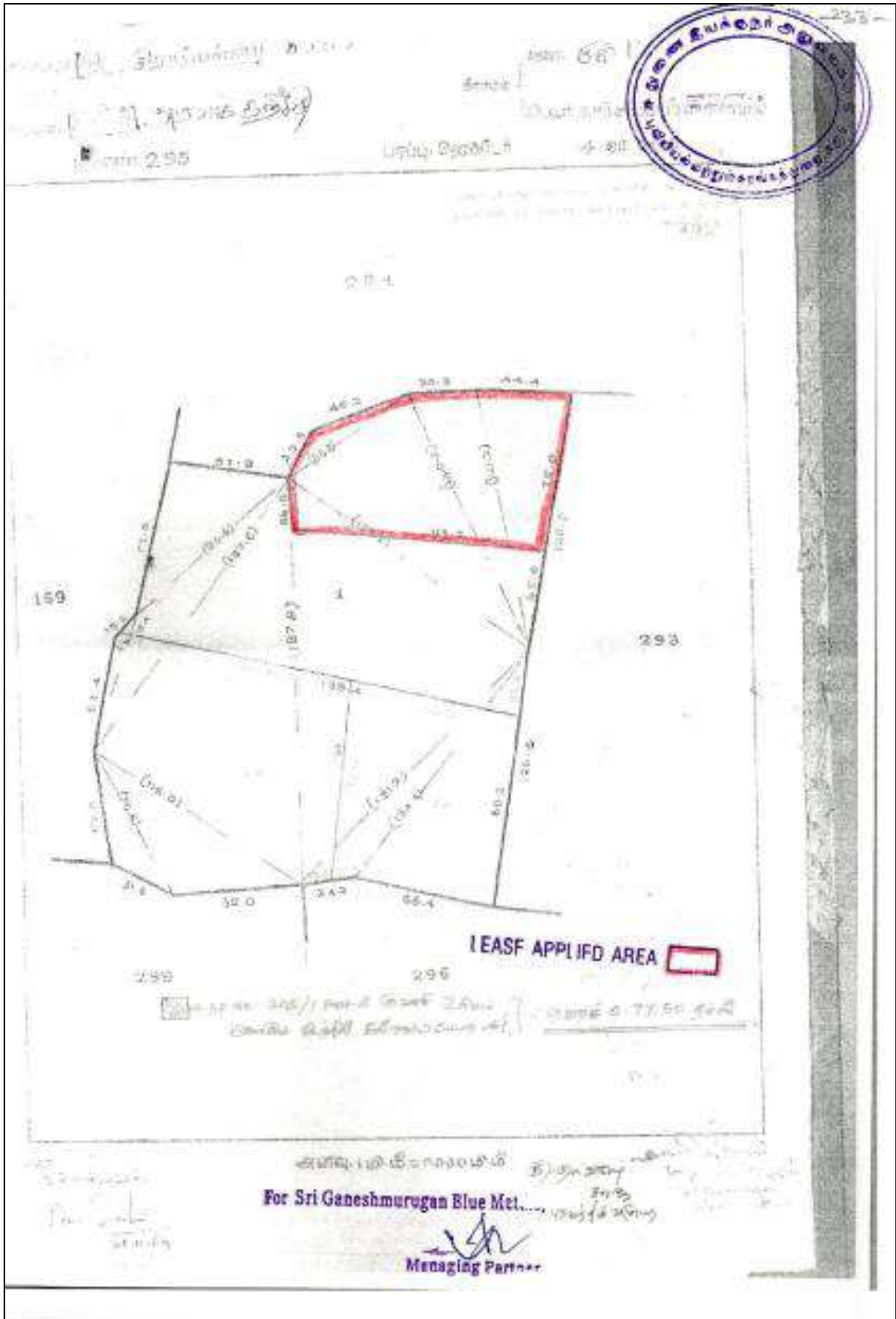
## **LAND DOCUMENTS**

Some of the important land related documents are shown in below.



An FMP sketch showing proposed lease area in red colour





An FMP sketch showing proposed lease area in red colour





பக்கம் 36 - கட்டுமானப் பணியின் பட்டியல்.

2	3	4	5	6	7	8	9	10	11	12
283	ச	4	00 84	6	1	38	0 84.0	1 16	471	ச. முத்துசாமிசவுந்தர்.
284-A	ச	4	01 84	6	1	38	0 22.5	0 31	951	முத்துசாமிசவுந்தர் - குமாரதேவ குமாரதேவ சவுந்தர். *
-B	ச	4	01 84	...	...	...	0 34.0	...	...	வசந்தி பாரதி.
							0 56.5	0 31		
285	ச	4	01 84	...	...	...	0 17.0	...	...	வசந்தி பாரதி.
286-பு	ச	4	01 84	6	1	38	0 37.5	0 52	471	ச. முத்துசாமிசவுந்தர்.
-பு	ச	4	01 84	6	1	38	0 61.0	0 85	143	ச. குமாரதேவ குமாரதேவ சவுந்தர்.
							0 98.5	1 37		
287	ச	4	01 84	...	...	...	0 16.0	...	...	வசந்தி பாரதி.
288	ச	4	01 84	6	1	38	4 02.5	5 57	788	ம. குமாரதேவ குமாரதேவ (1), ச. குமாரதேவ குமாரதேவ (2), ச. குமாரதேவ குமாரதேவ (3), ச. குமாரதேவ குமாரதேவ (4), ச. குமாரதேவ குமாரதேவ (5), ச. குமாரதேவ குமாரதேவ (6), ச. குமாரதேவ குமாரதேவ (7), ச. குமாரதேவ குமாரதேவ (8), ச. குமாரதேவ குமாரதேவ (9), ச. குமாரதேவ குமாரதேவ (10).
289	ச	4	01 84	6	1	38	4 51.0	6 24	523	ம. குமாரதேவ குமாரதேவ.
290	ச	4	01 84	6	1	38	1 35.0	1 86	621	ச. குமாரதேவ குமாரதேவ (1), ச. குமாரதேவ குமாரதேவ (2).
291	ச	4	01 84	...	...	...	0 59.0	...	...	வசந்தி பாரதி.
							0 22.5	...	...	வசந்தி பாரதி.
							0 68.0	0 94	406	ச. குமாரதேவ குமாரதேவ.
							0 70.0	0 97	57	ச. குமாரதேவ குமாரதேவ.
							0 70.0	0 97	463	ச. முத்துசாமிசவுந்தர்.

For Sri Ganeshmurugan Blue Metals,

Managing Partner.

சுப்பிரமணியன் குமாரதேவ,  
R2, AnnaLamburthi, சூரியன் குமாரதேவ குமாரதேவ.

A Register Document







தமிழக அரசு

வருவாய்த் துறை

நில உரிமை விபரங்கள் : இ. எண் 10(1) பிரிவு

மாவட்டம் : கரூர்

வட்டம் : புகளூர்

வருவாய் இராமம் : காருடையாம்பாளையம்

உரிமையாளர்கள் பெயர்

1. ஸ்ரீ கணேஷ் மூருகன் புனாமெட்டல்ஸ் நிழுவனத்திற்காக


... ஏகாம்பரம்



பட்டி எண் : 1853

புல எண்	உட்பிரிவு	புன்செய்		நன்செய்		மற்றவை		குறிப்புரைகள்
		பரப்பு	தீர்வை	பரப்பு	தீர்வை	பரப்பு	தீர்வை	
		ஹெக்டர் - ஏர்	ரூ - பை	ஹெக்டர் - ஏர்	ரூ - பை	ஹெக்டர் - ஏர்	ரூ - பை	
264	11	0 - 1.00	0.06	--	--	--	--	R261/13--- -- 21-02-2001
264	12	0 - 47.50	0.95	--	--	--	--	R261/13--- -- 21-02-2001
274	1	1 - 70.00	2.35	--	--	--	--	R261/13--- -- 21-02-2001
279	A1	1 - 40.00	1.93	--	--	--	--	R261/13--- -- 21-02-2001
293	1	0 - 68.00	0.94	--	--	--	--	2017/0103/14/040915- --- 15-09-2017
293	2	0 - 70.00	0.97	--	--	--	--	R261/13--- -- 17-02-2006
293	3	0 - 70.00	0.97	--	--	--	--	R261/13--- -- 22-02-2004
293	4	0 - 79.00	1.09	--	--	--	--	R261/13--- -- 22-02-2004
293	5	1 - 56.00	2.16	--	--	--	--	R261/13--- -- 17-02-2006
294	2B	2 - 1.50	2.79	--	--	--	--	R261/13--8A/50/1420 - 01-03-2011
295	1	2 - 14.50	2.97	--	--	--	--	2018/0103/14/050767- --- 19-02-2018
295	2A	1 - 21.86	1.69	--	--	--	--	2020/0103/14/119465- 2018/14/02/000024SD -- 19-02-2020
		13 - 39.36	18.87					

**குறிப்பு 2 :**



- மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் மின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தாங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 14/07/2022/01853/10207 என்ற குறிப்பு எண்ணை உள்ளீடு செய்து உறுதி செய்துகொள்ளவும்.
- இத் தகவல்கள் 14-07-2022 அன்று 02:29:54 PM நேரத்தில் அச்சிடக்கப்பட்டது.
- கைப்பேசி கேமராவின் 2D barcode டாடிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்

https://eservices.tn.gov.in/eservicesnew/land/chitta/Extract\_ta.html?lan=ta

For Sri Ganeshmurugan Blue Metals,

1/2

Managing Partner.

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