

**EXECUTIVE SUMMARY OF**  
**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT**  
**AND**  
**ENVIRONMENTAL MANAGEMENT PLAN**  
**FOR OBTAINING**  
**Environmental Clearance under EIA Notification – 2006**  
**Schedule Sl. No. 1 (a) (i): Mining Project**

**“B1” CATEGORY – MINOR MINERAL – CLUSTER – NON-FOREST LAND**  
**CLUSTER EXTENT = 10.51.5 hectares**

**Mr. B. VENKATAKRISHNAN RED EARTH QUARRY**  
**At**  
Kondalangkuppam Village, Vanur Taluk, Villuppuram District

ToR issued vide Letter No. SEIAA-TN/F.NO.9383/TOR-1279/2022 dated  
08.10.2022.

**NAME AND ADDRESS OF THE PROPOSED PROJECT PROPONENT**

| Name and Address  | Extent & S.F.No.                              |
|---|---|
| <b>Mr.B.Venkatakrishnan</b><br><b>No.25, 2nd Cross Street,</b><br><b>Kurumbapet, Housing Board,</b><br><b>Puducherry – 605009</b> | 1.53.5 ha &<br>70/2, 70/3, 70/4<br>70/5A,71/3 |

**ENVIRONMENTAL CONSULTANT**

**GEO TECHNICAL MINING SOLUTIONS**



No: 1/213-B, Ground Floor, Natesan Complex  
Oddapatti, Collectorate Post office,  
Dharmapuri-636705. Tamil Nadu.  
E-mail: [info.gtmsdpi@gmail.com](mailto:info.gtmsdpi@gmail.com),  
Website: [www.gtmsind.com](http://www.gtmsind.com)



NABET ACC. NO: NABET/EIA/2124/SA 0184  
Valid till: Dec 31, 2023

**ENVIRONMENTAL LAB**

**EKDANT ENVIRO SERVICES (P) LIMITED**

NABL Accredited & Recognised Laboratory  
No.R7/1, AVK Tower, North Main Road, Anna Nagar, West Exten.Chennai-600 101  
Baseline Study Period – December 2022 - February, 2023

APRIL-2023

## CHAPTER I INTRODUCTION

As the proposed red earth mining project, known as P1 falls within the 500 m radius cluster of quarries with the total extent of >5 ha (**i.e., 10.51.5 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 and three Expired Projects known as EX1, EX2 and EX3. 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 Kondalangkuppam Village, Vanur Taluk, Villuppuram District and Tamil Nadu State. In compliance with TOR obtained vide Letter No. SEIAA-TN/F.NO.9383/TOR-1279/2022 dated 08.10.2022. This EIA report has been prepared for the project proponent Mr. B.Venkatakrishnan applied for red earth quarry lease in the patta land falling in S.F.Nos.70/2, 70/3, 70/4, 70/5A & 71/3 over an extent of 1.53.5 ha in Kondalangkuppam Village, Vanur Taluk, Villuppuram District and Tamil Nadu. This EIA report takes into account the red earth quarry 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 three Expired Projects known as EX1, EX2 and EX3. 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 10.51.5 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>Mr.B.Venkatakrishnan</b>   |
| Address                              | S/o. Balaram<br>No.25, 2 <sup>nd</sup> Cross Street,<br>Kurumbapet, Housing Board,<br>Puducherry – 605009 |
| 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. and Village</b>                                    | <b>Extent (ha)</b> | <b>Status</b>                  |
| P1                          | B. Venkatakrishnan       | 70/2, 70/3, 70/4<br>70/5A,71/3<br>Kondalangkuppam               | 1.53.5             | Proposed Area                  |
| P2                          | S. Devamani              | 70/5B, 70/7B, 70/6,<br>88/2, 69/2, 70/8<br>Kondalangkuppam      | 3.05.5             | Applied Area                   |
| <b>Expired Quarries</b>     |                          |   |                    |                                |
| EX1                         | P. Senjivel              | 60/2<br>Kondalangkuppam   | 1.17.0             | 13.03.2018<br>to<br>12.03.2020 |
| EX2                         | A. Arikrishanan          | 85/1, 85/2, 85/3,<br>85/5, 89/2, 91/1B, 91/2<br>Kondalangkuppam | 3.54.0             | 23.03.2018<br>To<br>22.03.2020 |
| EX3                         | Tmt. A. Gunaselvi        | 194/2B1, 194/2B2,<br>194/3B, 194/4A<br>Kondalangkuppam          | 1.21.50            | 25.02.2020<br>to<br>24.02.2022 |
| <b>Total Cluster Extent</b> |                          |   | <b>10.51.5</b>     |                                |

**Source:**

*i. DD Letter: Rc.No.A/G & M/442/2021, Dated:13.06.2022.*

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

*Dated:01.07.2016.*

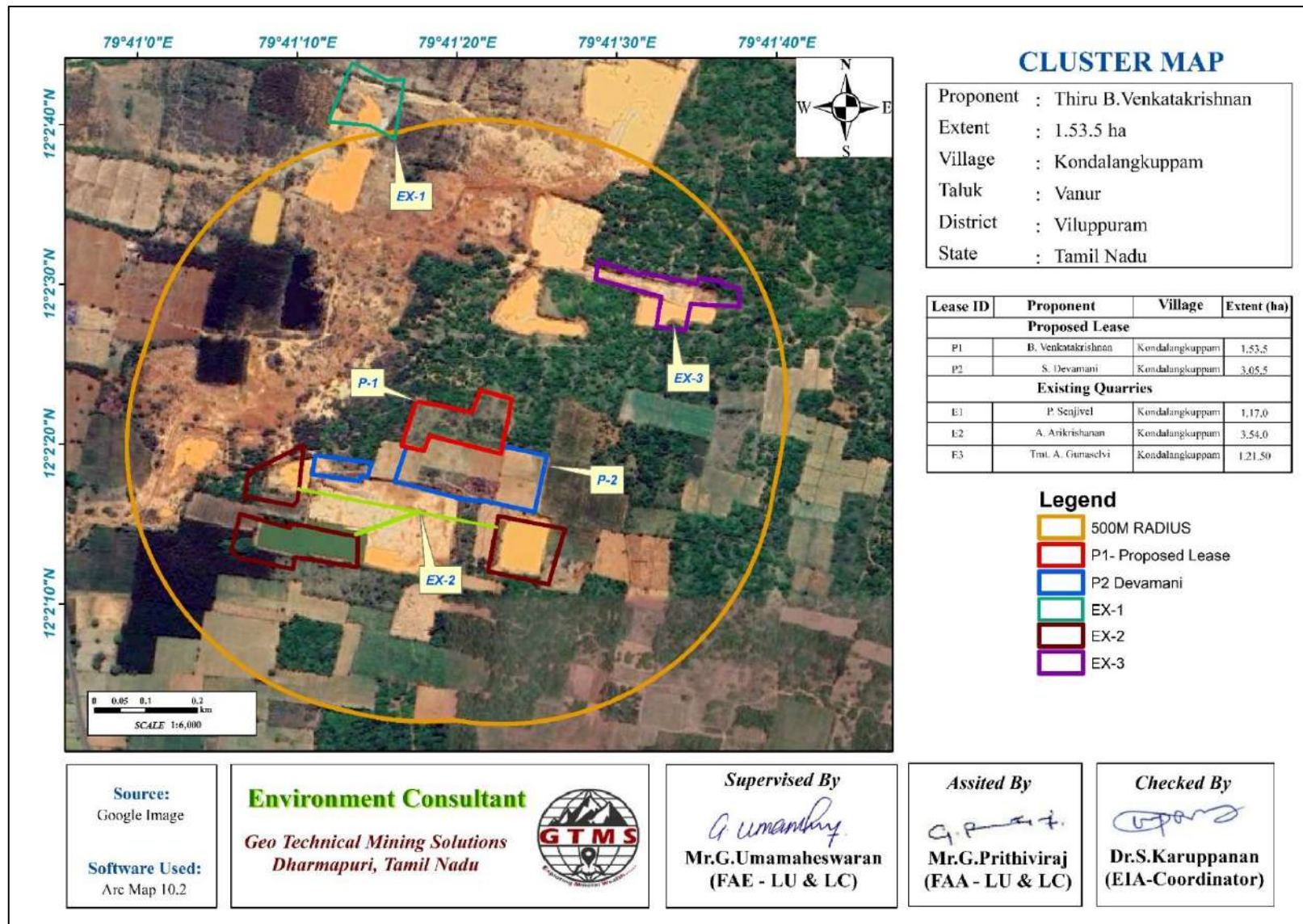


Figure 1.1 Google earth image showing 500m radius limits and the proposed project and existing quarries within the limit

## CHAPTER II

### PROJECT DESCRIPTION

The proposed project deals with excavation of red earth quarry which is primarily used in construction projects. The method adopted for red earth quarry excavation is an open cast semi-mechanized mining method. The proposed project area is located between latitudes from 12°02'19.41"N to 12°02'23.38"N and Longitudes from 79°41'16.53"E to 79°41'23.40"E in Kondalangkuppam Village, Vanur Taluk, Villuppuram District. The project site is a Patta land with the extent of 1.53.5 ha owned by the project proponent. The proponent had applied for quarry lease on 22.11.2021 to extract red earth and obtained the precise area communication letter issued by Department of Geology and Mining, Villuppuram vide Roc.No.B/G & M/09/2022 dated 06.06.2022. 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, Villuppuram (Rc.No.A/G&M/442/2021 dated 13.06.2022).

According to the approved mining plan, about 23004 m<sup>3</sup> of red earth will be mined up to the depth of 2 m BGL in two years. To achieve the estimated production, 1 excavator and 3 tippers will be deployed. To operate the machineries about 5 persons will be employed. At the end of the quarry life, the dimension of the ultimate pit will be 67 m\*92 m\*2 m and about 1.15.0 ha of land is used for quarrying; about 0.02.5 ha of land is unutilized. about 0.25.0 ha of land will have been green belt; about 0.11.0 ha of land will be used for Drainage and settling tank and the rest will be used for road and infrastructures.

The final mine closure plan shows that about Rs. 521900 with the annual recurring cost of Rs. 46050 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**

| <b>Pillar ID</b> | <b>Latitude</b> | <b>Longitude</b> |
|------------------|-----------------|------------------|
| 1                | 12°2'22.83"N    | 79°41'23.40"E    |
| 2                | 12°2'20.05"N    | 79°41'22.87"E    |
| 3                | 12°2'19.41"N    | 79°41'22.76"E    |
| 4                | 12°2'20.53"N    | 79°41'18.29"E    |
| 5                | 12°2'19.58"N    | 79°41'17.93"E    |
| 6                | 12°2'19.90"N    | 79°41'16.53"E    |

|    |              |               |
|----|--------------|---------------|
| 7  | 12°2'22.67"N | 79°41'17.43"E |
| 8  | 12°2'22.42"N | 79°41'18.97"E |
| 9  | 12°2'21.98"N | 79°41'20.91"E |
| 10 | 12°2'23.38"N | 79°41'21.49"E |

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

| Type of Features | Name/Location   | Distance (km) | Direction |
|------------------|-----------------|---------------|-----------|
| Nearest Roadways | SH - 136        | 1.86 km       | E         |
| Nearest Villages | Parankani       | 1.19 km       | N         |
|                  | Kondalangkuppam | 1.12 km       | SW        |
|                  | Ranganathapuram | 1.80 km       | E         |
|                  | Thollamur       | 2.0km         | NW        |
| Nearest Airport  | Cuddalore       | 36 km         | NE        |
| Nearest Seaport  | Chennai         | 141.5 km      | NE        |

### 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                                  | Red Earth (m <sup>3</sup> ) |
|--|-----------------------------|
| Geological Resource in m <sup>3</sup>          | 30712                       |
| Mineable Reserves in m <sup>3</sup>            | 23004                       |
| Proposed production for 2 years m <sup>3</sup> | 23004                       |

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

**Table 2.4 Year-Wise Production Details**

| Year         | Red Earth (m <sup>3</sup> ) |
|--------------|-----------------------------|
| I            | 12148                       |
| II           | 10856                       |
| <b>Total</b> | <b>23004</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 Mining        | Nil               | 1.15.0                                 |
| Infrastructure           | Nil               | 0.01.0                                 |
| Roads                    | Nil               | 0.04.0                                 |
| Green Belt               | Nil               | 0.25.0                                 |
| Unutilized area          | 1.53.5            | 0.02.5                                 |
| Drainage & Settling tank | Nil               | 0.06.0                                 |
| <b>Total</b>             | <b>1.53.5</b>     | <b>1.53.5</b>                          |

Source: Approved mining plan

## 2.4 METHOD OF MINING

The quarrying operation is proposed to be carried out by Open -Cast Semi-Mechanized mining method.

## 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  | Excavator | 1          | --       | -    | Diesel Drive |
| <b>Haulage &amp; Transport Equipment</b> |           |            |          |      |              |
| 2  | Tipper    | 3          | -        | -    | Diesel Drive |

**Table 2.7 Fuel Requirement Details**

| <b>Fuel Requirement for Excavator</b>         |                                      |                         |
|---|--------------------------------------|-------------------------|
| Details                                       | Red Earth<br>(23004 m <sup>3</sup> ) | Total Diesel<br>(litre) |
| Average Rate of Fuel Consumption (l/hr)       | 10                                   | ---                     |
| Working Capacity (m <sup>3</sup> /hr)         | 60                                   | ---                     |
| Time Required (hours)                         | 383                                  | ---                     |
| Total Diesel Consumption for 2 years (litre)  | 3834                                 | 3834                    |
| <b>Fuel Requirement for Tipper</b>            |                                      |                         |
| Average Rate of Fuel Consumption/Trip (litre) | 20                                   | --                      |
| Carrying Capacity in m <sup>3</sup>           | 6                                    | --                      |
| Number of Trips / days                        | 7.1                                  | --                      |

|   |       |              |
|---|-------|--------------|
| Number of Trips / 2 years                               | 3834  | --           |
| Total Diesel Consumption for 2 years (litre)            | 76680 | 76680        |
| <b>Total Diesel Consumption by Excavator and Tipper</b> |       | <b>80514</b> |

**Table 2.8 Capital Requirement Details**

| S. No.                    | Description      | Cost (Rs.)         |
|---------------------------|------------------|--------------------|
| 1                         | Fixed Asset      | 640000             |
| 2                         | Operational cost | 500000             |
| 3                         | EMP              | 125000             |
| 4                         | Expenditure cost | 110000             |
| <b>Total Project Cost</b> |                  | <b>13,75,000/-</b> |

*Source: Approved Mining Plan*

## 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 2.9.

**Table 2.9 Mine Closure Budget**

| Activity                          | Capital Cost  | Recurring Cost/Annum |
|-----------------------------------|---------------|----------------------|
| 307 plants inside the lease area  | 61400         | 9210                 |
| 461 plants outside the lease area | 138150        | 13815                |
| Wire Fencing                      | 307000        | 15350                |
| Renovation of Garland Drain       | 15350         | 7675                 |
| <b>Total</b>                      | <b>521900</b> | <b>46050</b>         |



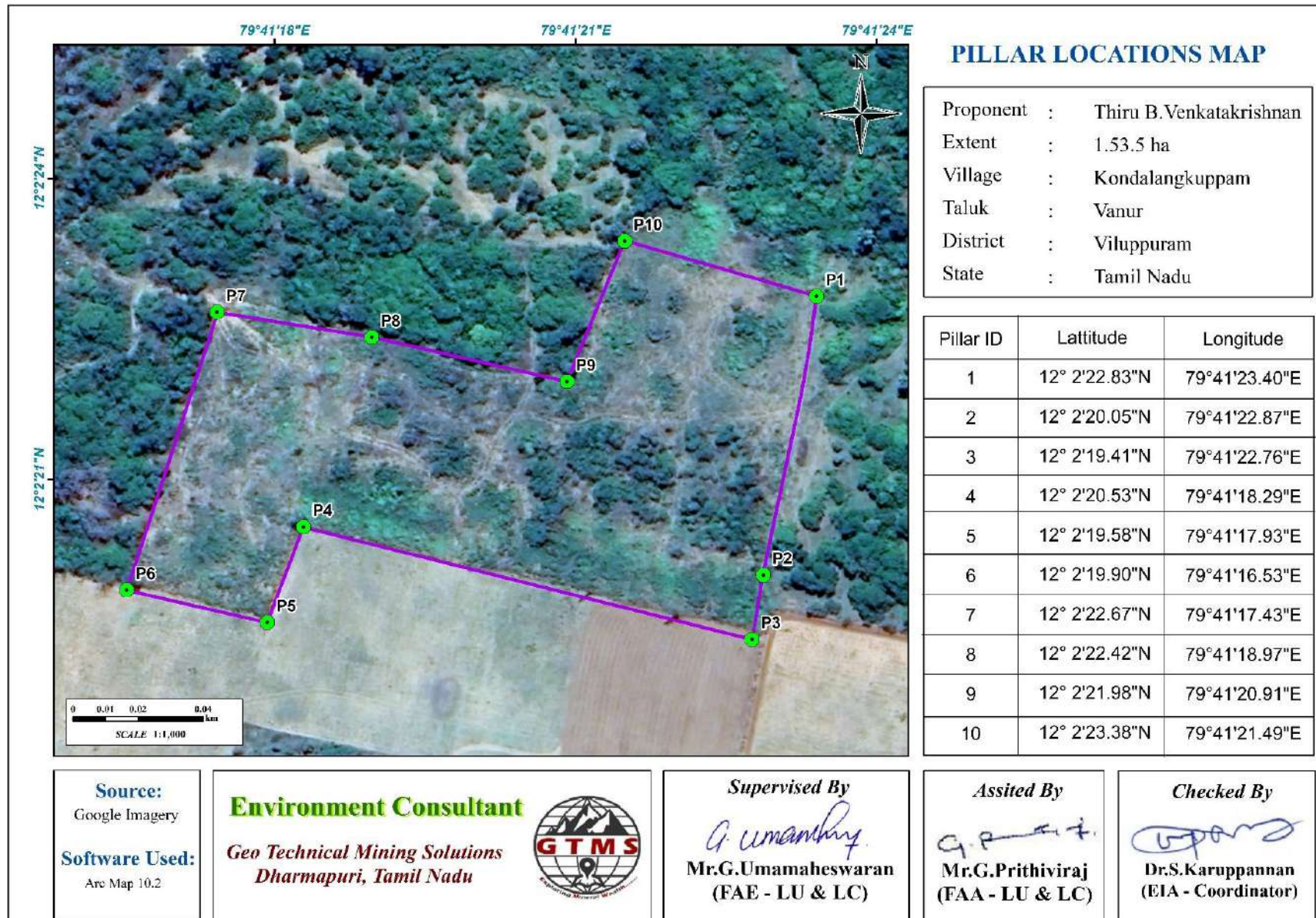


Figure 2.1 Google Earth Image Showing Lease Area with Pillars

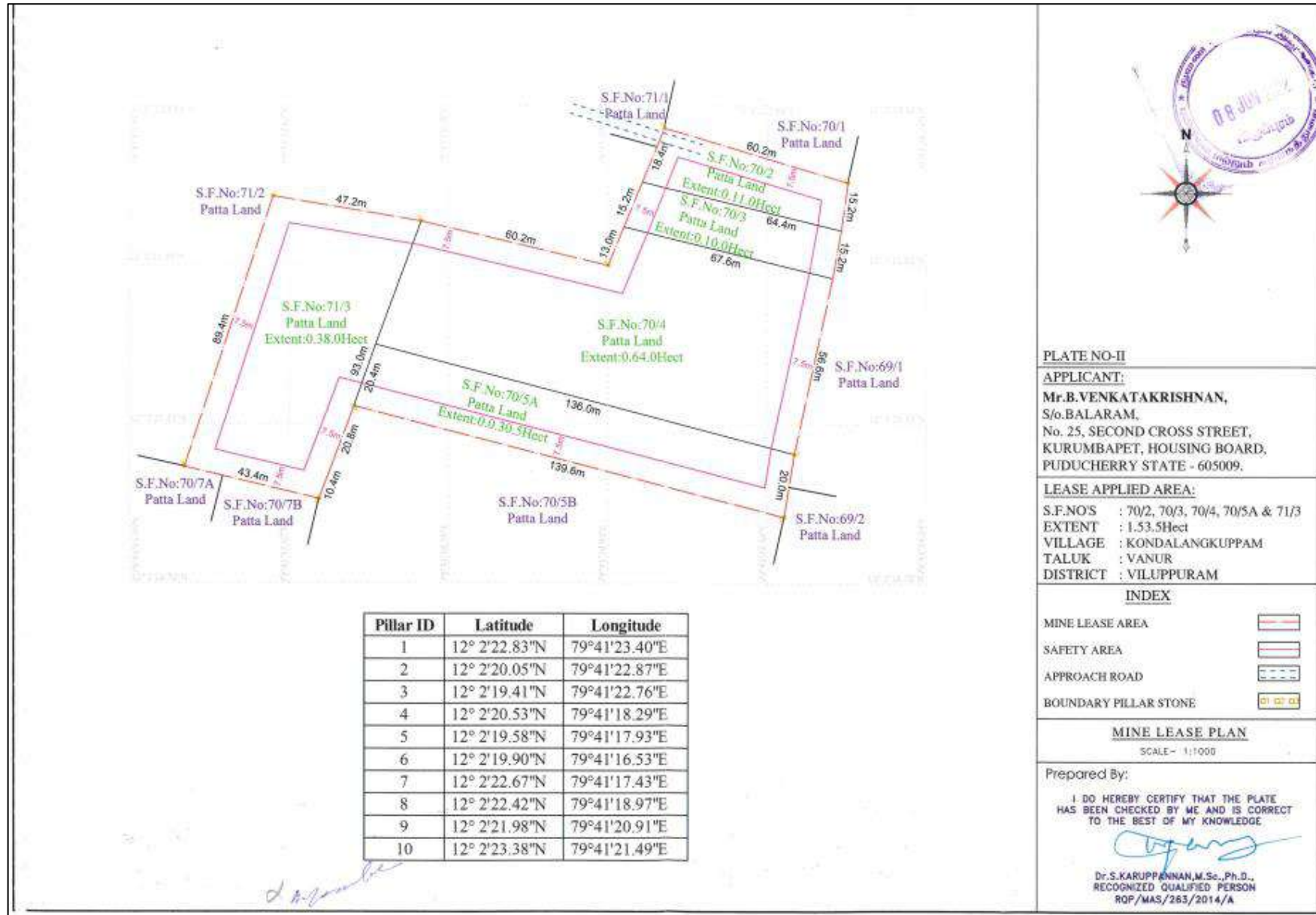


Figure 2.2 Mine Lease Plan

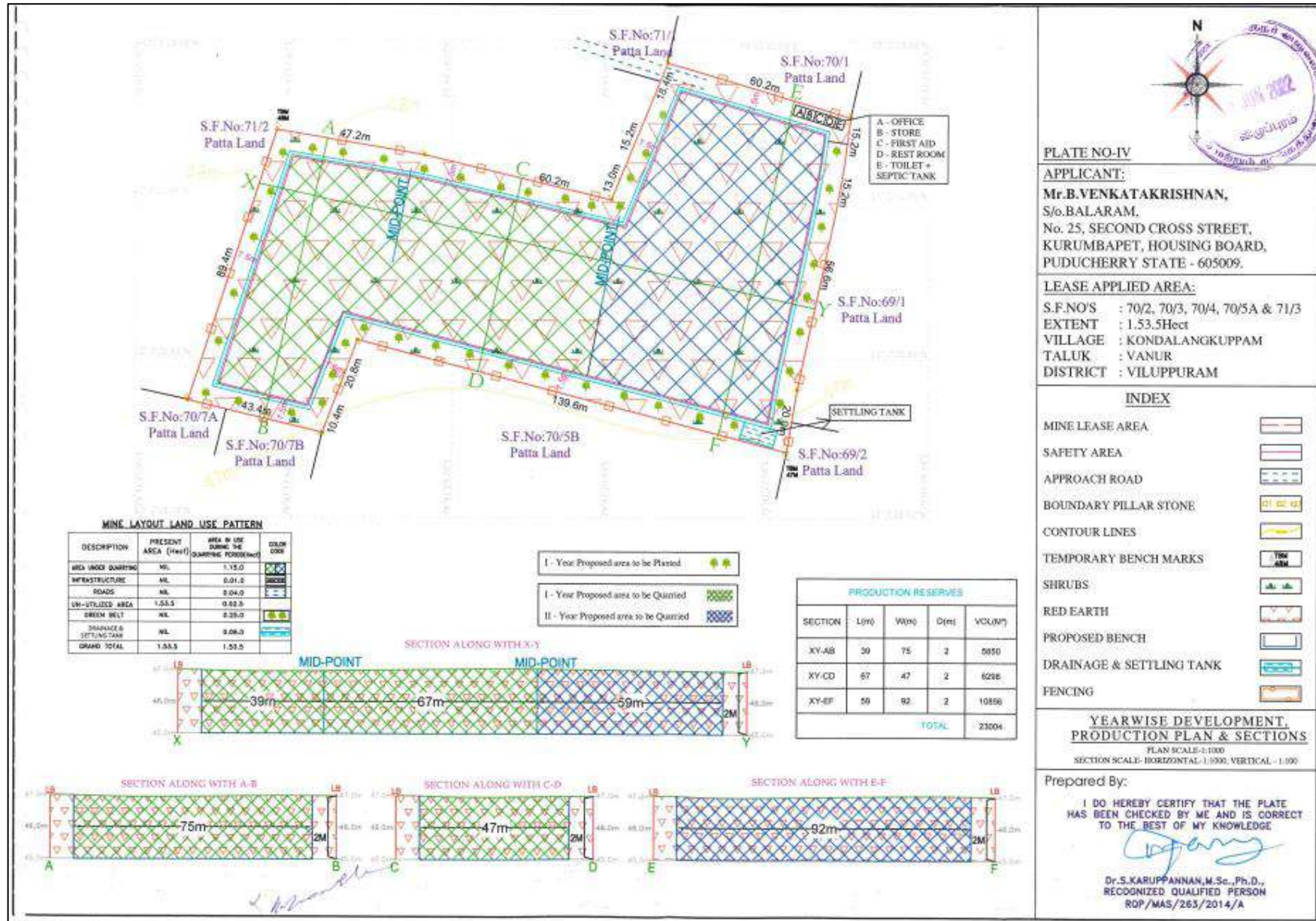


Figure 2.3 Development, Production Plan and Sections

**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 **December 2022 - February, 2023** 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**

| S. No.       | Classification             | Area (ha)      | Area (%)   |
|--------------|----------------------------|----------------|------------|
| 1            | Barren Rocky/ Stony Waste  | 190.73         | 2.51       |
| 2            | Crop Land                  | 2640.19        | 34.72      |
| 3            | Dense Forest               | 1027.60        | 13.52      |
| 4            | Fallow Land                | 15.22          | 0.20       |
| 5            | Land with or without scrub | 358.51         | 4.72       |
| 6            | Mining/Industrial lands    | 113.19         | 1.49       |
| 7            | Plantations                | 2671.05        | 35.13      |
| 8            | Settlements                | 240.88         | 3.17       |
| 9            | Water Bodies               | 345.87         | 4.55       |
| <b>Total</b> |                            | <b>7603.25</b> | <b>100</b> |

*Source: Sentinel II Satellite Imagery*

**3.2 SOIL ENVIRONMENT**

Seven 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 silty clay loam, silty loam and sandy loam. pH of the soil varies from 7.1 to 7.5 indicating slightly acidic to slightly alkaline nature. Electrical conductivity of the soil varies from 217 to 287  $\mu\text{s}/\text{cm}$ . Bulk density ranges between 1.01 and 1.53  $\text{g}/\text{cm}^3$ .

***Chemical Characteristics***

Calcium ranges between 78 and 156 mg/kg. Magnesium ranges between 18.8 and 29.2 mg/kg. Potassium ranges between 17.34 and 34.90 mg/kg. Iron content ranges between 78.7-172.4 mg/kg. Organic matter content ranges between 0.98 and 1.41 %.

### ***Soil Erosion***

Soil erosion map shows that:

- ❖ Soil erosion is very low in the proposed lease area
- ❖ Low to moderate soil erosion is in south side of the lease area.

### **3.3 WATER ENVIRONMENT**

#### ***Surface Water***

Sangarabarani River is the prominent surface water resources present in the study area. This river was ephemeral in nature, which convey water only after rainfall events. The proposed project area is located in 4.63 (Thiruvakkarai) km WSW of Sangarabarani River and 3.72 (Kaikilampattu) km SW of Sangarabarani River. Two surface water sample, known as SW01 and SW02 were collected from the Sangarabarani River in Thiruvakkarai (4.63 km) and Sangarabarani River in Kaikilampattu (3.72 km), to assess the baseline water quality. Result for surface water sample in the indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

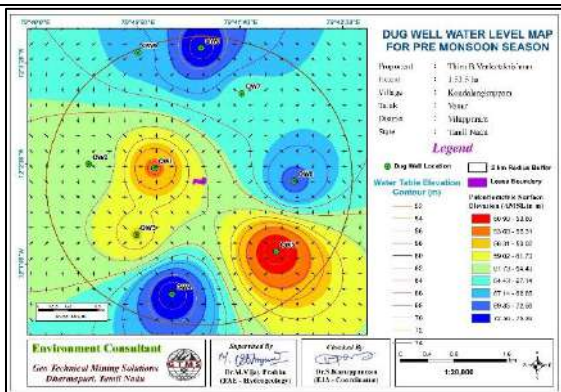
#### ***Ground Water Resources***

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. Six groundwater samples, known as OW01, OW02, BW01, BW02, BW03 and BW04 collected from bore wells and open wells were analysed for physico-chemical conditions, heavy metals and bacteriological contents in order to assess baseline quality of ground water. Results for ground water samples indicate that the physical, chemical and biological parameters, and heavy metals are within permissible limits in comparison with standards of IS10500:2012.

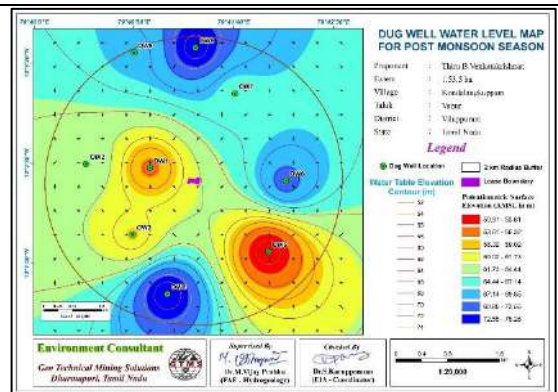
#### ***Groundwater Levels and Flow Direction***

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 March through May 2022 (Pre-Monsoon Season) and from December 2022 through February, 2023 (Post Monsoon Season). Average depths to the static water table in open wells range from 11.3 to 15.9 m BGL in pre monsoon and 6.5 to 10.5 m BGL in post monsoon. The average depths to static potentiometric surface in bore wells for the period of December 2022 through February, 2023 (Post Monsoon Season) vary from 55.10 to 60.0 m and from 60.2 to 70.0 m for the period of March through May, 2022 (Pre-Monsoon Season). The bore well

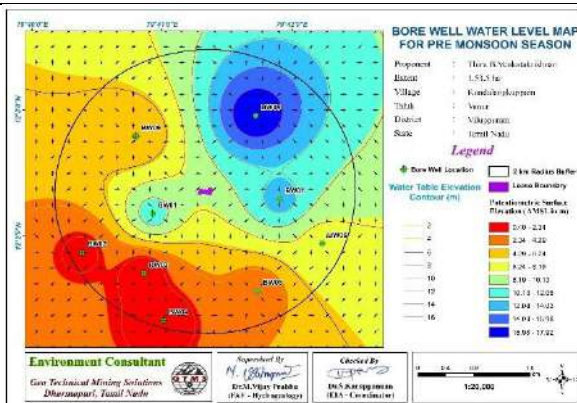
groundwater for the post- and pre-monsoon seasons flows towards the bore well number 3. It is located in South Southwest direction of the proposed project site.



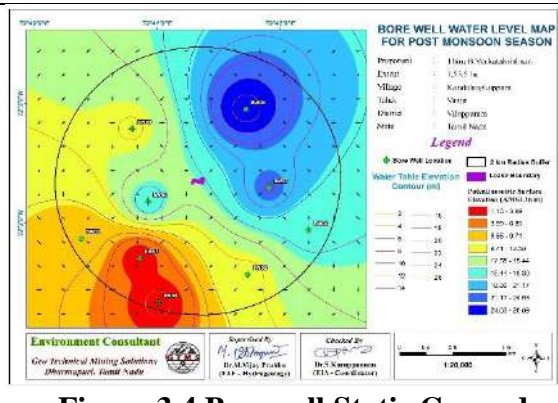
**Figure 3.1 Open Well Static Groundwater Elevation Map Showing the Direction of Groundwater Flow During Pre-Monsoon Season**



**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>2.5</sub> ranges from 15.2 µg/m<sup>3</sup> to 19.3 µg/m<sup>3</sup>; PM<sub>10</sub> from 32.3 µg/m<sup>3</sup> to 36.9 µg/m<sup>3</sup>; SO<sub>2</sub> from 6.9 µg/m<sup>3</sup> to 10.0 µg/m<sup>3</sup>; NO<sub>x</sub> from 13.0 µg/m<sup>3</sup> to 18.9 g/m<sup>3</sup>. The concentration levels of the pollutants fall within the acceptable limits of NAAQS prescribed by CPCB.

### 3.5 NOISE ENVIRONMENT

The noise level in core zone was 39.2 dB (A) Leq during day time and 35.6 dB(A) Leq during night time. Noise levels recorded in buffer zone during day time varied from 40.4 to 46.8 dB (A) Leq and during night time from 35.8 to 41.6 dB (A) Leq. Thus, the noise level for industrial and residential area meets the requirements of CPCB.

### 3.6 BIOLOGICAL ENVIRONMENT

Biological assessment of the site was done to identify ecologically sensitive areas and whether there are any rare, endangered, endemic or threatened (REET) species of flora & fauna in the core area as well its buffer zone to be impacted. The study has also been designed to suggest suitable mitigation measures, if necessary, for protection of wildlife habitats and conservation of REET species if any. The study found that there is no endemic, endangered migratory fauna found in the area. This area is not also a migratory path of any faunal species. Hence, this small mining operation over short period of time will not have any significant impact on the surrounding flora and fauna.

### 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.

### 3.7 TRAFFIC ENVIRONMENT

**Table 3.2 Traffic Survey Locations**

| Station Code | Road Name           | Distance and Direction | Type of Road        |
|--------------|---------------------|------------------------|---------------------|
| TS1          | Village Road        | 0.96 Km-SW             | Village Road        |
| TS2          | Mayilam-pondicherry | 2.9 Km-NNW             | Mayilam-pondicherry |

*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          | 35  | 105 | 42  | 42  | 69           | 35  | 182       |
| TS2          | 98  | 294 | 51  | 51  | 102          | 51  | 396       |

*Source: On-site monitoring by GTMS FAE & TM*

**Table 3.4 Red Soil Transportation Requirement**

| Transportation of red earth per day |                      |               |
|-------------------------------------|----------------------|---------------|
| Capacity of trucks                  | No. of Trips per day | Volume in PCU |
| 15 tonnes                           | 7                    | 21            |

Source: Approved Mining Plan

**Table 3.5 Summary of Traffic Volume**

| Route                | Existing traffic volume in PCU | Incremental traffic due to the project | Total traffic volume | Hourly Capacity in PCU as per IRC – 1960 guidelines |
|----------------------|--------------------------------|--|----------------------|---|
| Village Road         | 182                            | 21                                     | 203                  | 1200  |
| Mayilam- Pondicherry | 396                            | 21                                     | 417                  | 1200  |

Source: On-site monitoring analysis summary by GTMS FAE & TM

### 3.8 SITE SPECIFIC FEATURES

**Table 3.6 Details of Environmentally Sensitive Ecological Features in the Study Area**

| S. No | Sensitive Ecological Features                     | Name                  | Areal Distance in km from cluster |
|-------|---|-----------------------|-----------------------------------|
| 1     | National Park / Wild life Sanctuaries             | None                  | Nil within 10 km radius           |
|       |   | None                  | Nil within 10 km radius           |
| 2     | Reserve Forest                                    | None                  | Nil within 10 km radius           |
| 3     | Lakes/Reservoirs/ Dams/Streams/Rivers             | Gingee River          | 3.62 km S                         |
|       |   | Ossudu Lake           | 8.6 km SE                         |
| 4     | Tiger Reserve/Elephant Reserve/ Biosphere Reserve | Ossudu Bird Sanctuary | 8.6 km SE                         |
| 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           |

Source: Survey of India Toposheet



## 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*

- ❖ Permanent impact on mineral resources due to removal of 23004 m<sup>3</sup> of Red Earth
- ❖ Permanent or temporary change on land use and land cover
- ❖ Change in topography of the mine lease area
- ❖ Problems to agricultural land and human habitations due to dust, and noise caused by movement of heavy vehicles
- ❖ Degradation of the aesthetic environment of the core zone due to quarrying
- ❖ Soil erosion and sediment deposition in the nearby water bodies due to earthworks during the rainy season
- ❖ Siltation of water course due to wash off from the exposed working area

##### *Mitigation Measures*

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

- ❖ Proper fencing will be carried out at the conceptual stage, Security will be posted round the clock, to prevent inherent entry of the public and cattle.

## **4.2 SOIL ENVIRONMENT**

### ***Anticipated Impact***

This project does not result in any impact on the soil of the project site as topsoil is neither removed from the project site nor preserved in the safety margin area. However, some of the common mitigation measures have been discussed in the following sections to protect the immediate soil environment surrounding the lease area.

### ***Soil Erosion***

- ❖ Low to moderate soil erosion is observed in the south side of the lease area

### ***Mitigation Measures***

- ❖ Soil erosion is very low in the proposed lease area. Therefore, the lease area will not cause soil erosion in any way. but Run-off diversion – Garland drains will be constructed around the project boundary to prevent surface flows from entering the quarry works areas and will be discharged into vegetated natural drainage lines, or as distributed flow across an area stabilised against erosion.
- ❖ Sedimentation ponds - Run-off from working areas will be routed towards sedimentation ponds. These trap sediment and reduce suspended sediment loads before runoff is discharged from the quarry site. Sedimentation ponds should be designed based on runoff, retention times, and soil characteristics. There may be a need to provide a series of sedimentation ponds to achieve the desired outcome.
- ❖ Retain vegetation – Retain existing or re-plant the vegetation at the site wherever possible.
- ❖ Monitoring and maintenance – Weekly monitoring and daily maintenance of erosion control systems so that they perform as specified specially during rainy season.

## **4.3 WATER ENVIRONMENT**

### ***Anticipated Impact***

- ❖ As the water required for the mining operations, obtained from the approved water supplying agency, the project does not develop any abstraction structures in the lease area. Therefore, no impact responsible for the water table declination is anticipated.
- ❖ Surface and ground water resources may be contaminated due to mine pit water discharge, domestic sewage, waste water from vehicle washing, washouts from surface exposure or working areas, discharge of oil & grease, and suspended solids due to waste

from washing of machineries. To address this impact, some of the important mitigation measures is provided as below.

### ***Mitigation Measures***

- ❖ Garland drainage system and settling tank will be constructed along the proposed mining lease area. The garland drainage will be connected to settling tank and sediments will be trapped in the settling tanks and only clear water will be discharged to the natural drainage
- ❖ Rainwater from the mining pits will be collected in sump and will be allowed to store and pumped out to surface settling tank of 15 m x 10 m x 3 m to remove suspended solids if any. This collected water will be judiciously used for dust suppression and such sites where dust likely to be generated and for developing green belt. The proponent will collect and judiciously utilize the rainwater as part of rainwater harvesting system.
- ❖ The water collected will be reused during storm for dust suppression and greenbelt development within the mines.
- ❖ Interceptor traps/oil separators will be installed to remove oils and greases. Water from the tipper wash-down facility and machinery maintenance yard will be passed through interceptor traps/oil separators prior to its reuse.
- ❖ Flocculating or coagulating agents will be used to assist in the settling of suspended solids during monsoon seasons.
- ❖ Periodic (every 6 month once) analysis of ground water quality of quarry pit water and ground water of nearby villages will be conducted.
- ❖ Domestic sewage from site office and urinals/latrines provided in ML is discharged in septic tank followed by soak pits.
- ❖ Waste water discharge from mine will be treated in settling tanks before using for dust suppression and tree plantation purposes.
- ❖ De-silting will be carried out before and immediately after the monsoon season.
- ❖ Regular monitoring (once every 6 months) and analysing the quality of water in open well, bore wells and surface water.

#### 4.4 AIR ENVIRONMENT

##### *Anticipated Impact*

- ❖ Emission of air pollutants such as particular matter (PM), gases such as sulphur dioxide, oxides of nitrogen at various stages of activities such as excavation and transportation of materials. The rate of emission and the incremental concentration of pollutants is estimated in the following sections before 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    |
|------------|----------------------------|-----------|--|-----------|-------|---|-------------------------|-----------------|
|            |                            |           | Baseline   | Predicted | Total |   |                         |                 |
| AAQ1       | --                         | --        | 20.6   | 5.87      | 26.47 | Below Standard  | 28.50                   | Not Significant |
| AAQ2       | 1.80                       | SW        | 15.8   | 5         | 20.8  |   | 31.65                   |                 |
| AAQ3       | 4.74                       | SW        | 16.7   | 0.5       | 17.2  |   | 2.99                    |                 |
| AAQ4       | 3.95                       | NW        | 19.8   | 0.5       | 20.3  |   | 2.53                    |                 |
| AAQ5       | 4.17                       | SSE       | 17.9   | 0         | 17.9  |   | 0.00                    |                 |
| AAQ6       | 1.91                       | ENE       | 14.8   | 0         | 14.8  |   | 0.00                    |                 |
| AAQ7       | 3.78                       | NNE       | 15.4   | 0         | 15.4  |   | 0.00                    |                 |

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

| Station ID | Distance to core area (km) | Direction | PM <sub>10</sub> concentrations (µg/m <sup>3</sup> ) |           |       | Comparison against air quality standard (100 µg/m <sup>3</sup> ) | Magnitude of change (%) | Significance    |
|------------|----------------------------|-----------|--|-----------|-------|--|-------------------------|-----------------|
|            |                            |           | Baseline   | Predicted | Total |  |                         |                 |
| AAQ1       | --                         | --        | 37.7   | 9.18      | 46.88 | Below Standard   | 24.35                   | Not Significant |
| AAQ2       | 1.80                       | SW        | 33.3   | 5         | 38.3  |  | 15.02                   |                 |
| AAQ3       | 4.74                       | SW        | 35.8   | 1         | 36.8  |  | 2.79                    |                 |
| AAQ4       | 3.95                       | NW        | 38.0   | 0.5       | 38.5  |  | 1.32                    |                 |
| AAQ5       | 4.17                       | SSE       | 33.2   | 0         | 33.2  |  | 0.00                    |                 |
| AAQ6       | 1.91                       | ENE       | 31.2   | 0         | 31.2  |  | 0.00                    |                 |
| AAQ7       | 3.78                       | NNE       | 33.7   | 0         | 33.7  |  | 0.00                    |                 |

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

| Station ID | Distance to core area (km) | Direction | SO <sub>2</sub> concentrations (µg/m <sup>3</sup> ) |           |       | Comparison against air quality standard (80 µg/m <sup>3</sup> ) | Magnitude of change (%) | Significance    |
|------------|----------------------------|-----------|---|-----------|-------|---|-------------------------|-----------------|
|            |                            |           | Baseline  | Predicted | Total |   |                         |                 |
| AAQ1       | --                         | --        | 11.5  | 5.03      | 16.53 | Below Standard  | 43.74                   | Not Significant |
| AAQ2       | 1.80                       | SW        | 7.5   | 1         | 8.5   |   | 13.33                   |                 |
| AAQ3       | 4.74                       | SW        | 7.9   | 0.5       | 8.4   |   | 6.33                    |                 |
| AAQ4       | 3.95                       | NW        | 9.6   | 0.5       | 10.1  |   | 5.21                    |                 |
| AAQ5       | 4.17                       | SSE       | 7.8   | 0         | 7.8   |   | 0.00                    |                 |
| AAQ6       | 1.91                       | ENE       | 6.8   | 0         | 6.8   |   | 0.00                    |                 |
| AAQ7       | 3.78                       | NNE       | 7.7   | 0         | 7.7   |   | 0.00                    |                 |

**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    |
|------------|----------------------------|-----------|--|-----------|-------|---|-------------------------|-----------------|
|            |                            |           | Baseline   | Predicted | Total |   |                         |                 |
| AAQ1       | --                         | --        | 19.5   | 2.87      | 22.37 | Below Standard  | 14.72                   | Not Significant |
| AAQ2       | 1.80                       | SW        | 15.8   | 1         | 16.8  |   | 6.33                    |                 |
| AAQ3       | 4.74                       | SW        | 16.8   | 0.5       | 17.3  |   | 2.98                    |                 |
| AAQ4       | 3.95                       | NW        | 17.9   | 0.5       | 18.4  |   | 2.79                    |                 |
| AAQ5       | 4.17                       | SSE       | 16.0   | 0         | 16    |   | 0.00                    |                 |
| AAQ6       | 1.91                       | ENE       | 14.2   | 0         | 14.2  |   | 0.00                    |                 |
| AAQ7       | 3.78                       | NNE       | 15.0   | 0         | 15    |   | 0.00                    |                 |

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***

### ***Haul Road and Transportation***

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

### ***Green Belt***

- ❖ Planting of trees all along mine haul roads outside the lease and regular grading of haul roads will be practiced to prevent the generation of dust due to movement of tractors/tippers.
- ❖ Green belt of adequate width will be developed around the project site.

### ***Occupational Health***

- ❖ Dust mask will be provided to the workers and their use will be strictly monitored.
- ❖ Annual medical checkups, trainings and campaigns will be arranged to ensure awareness about importance of wearing dust masks among all mine workers and tipper drivers.
- ❖ Ambient air quality monitoring will be conducted every six months to assess effectiveness of mitigation measures proposed.

## 4.5 NOISE ENVIRONMENT

### *Anticipated Impact*

**Table 4.5 Predicted Noise Incremental Values**

| Noise Monitoring Location | Distance From Project Site(m)  | Baseline Noise Level (dBA)m During Day Time | Predicted Noise Level(dBA) | Total(dBA) |
|---------------------------|--|---|----------------------------|------------|
| Core                      | 100  | 39.2  | 35.70                      | 40.80      |
| Thollamur                 | 1690   | 41.8  | 11.14                      | 41.80      |
| Kadagampattu              | 1800   | 41.0  | 10.59                      | 41.00      |
| Kodukkur                  | 4740   | 42.4  | 2.18                       | 42.40      |
| Eraiyur                   | 3950   | 46.8  | 3.77                       | 46.80      |
| Katterikuppam             | 4170   | 40.4  | 3.30                       | 40.40      |
| Ranganathapuram           | 1910   | 45.8  | 10.08                      | 45.80      |
| Semangalam                | 3780   | 40.6  | 4.15                       | 40.60      |
| NAAQ Standards            | Industrial Day Time - 75 dB (A) & Night Time- 70 dB (A)<br>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.

### *Mitigation Measures*

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

## 4.6 BIOLOGICAL ENVIRONMENT

### Impact on Ecology and Biodiversity

- ❖ Quarry leases have a large number of *Acacia holoseicea* plants whose seeds are wind-dispersed so that they are abundant both inside and outside the quarry leases area. It contains a total of 18 species belonging to 16 families have been recorded from the buffer zone. 3 Trees (16%), 6 Shrubs (33%) and 9 Herbs (50%) were identified in mine lease area.
- ❖ 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 zone is undulating terrain with croplands, patches of grass and small shrubs. Therefore, excavation of the soil will also affect the vegetation of the croplands, grass patches and small shrubs in the area.
- ❖ Carbon released from quarrying machineries and tippers during quarrying would be 400 kg per day, 107889 kg per year and 215778 kg for two years, as provided in Table 4.6.

**Table 4.6 Carbon Released During Two Years of Red Earth Production**

|                                  | <b>Per day</b> | <b>Per year</b> | <b>Per two years</b> |
|----------------------------------|----------------|-----------------|----------------------|
| Fuel consumption of excavator    | 7.1            | 1917            | 3834                 |
| Fuel consumption of compressor   | 0              | 0               | 0                    |
| Fuel consumption of tipper       | 142            | 38340           | 76680                |
| Total fuel consumption in liters | 149.1          | 40257           | 80514                |
| CO <sub>2</sub> emission in kg   | 400            | 107889          | 215778               |

### Mitigation Measures on Flora

- ❖ 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.
- ❖ None of the plants in the lease area will be cut during operational phase of the mine. We recommend uprooting and planting 3 trees in the 7.5-meter safety zone to prevent general damage during quarrying. As the survival rate due to uprooting was only 30%, 90 seedlings



were procured at the rate of 10 seedlings per tree. Seedlings are planted and protected in 7.5-meter safety zone.

### ***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 768 trees will be planted within three months from the beginning of mining. These trees, when grown up would sequester carbon of 68 about kg of the total carbon, as provided in Table 4.7.

**Table 4.7 CO<sub>2</sub> Sequestration**

|  |      |       |        |
|--|------|-------|--------|
| CO <sub>2</sub> sequestration in kg                      | 68   | 18402 | 92008  |
| Remaining CO <sub>2</sub> not sequestered in kg          | 331  | 89487 | 123770 |
| Trees required for environmental compensation            | 3729 |       |        |
| Area required for environmental compensation in hectares | 7    |       |        |

## **4.7 SOCIO ECONOMIC ENVIRONMENT**

### ***Anticipated Impact***

- ❖ 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
- ❖ Increase in Employment opportunities both direct and indirect thereby increasing economic status of people of the region.

### ***Mitigation Measures***

- ❖ Good maintenance practices will be adopted for all 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.
- ❖ Air pollution control measure will be taken to minimize the environmental impact within the core zone.
- ❖ For the safety of workers, personal protective appliances like hand gloves, helmets, safety shoes, goggles, aprons, nose masks and ear protecting devices will be provided as per mines act and rules.
- ❖ Benefit to the State and the Central governments through financial revenues by way of royalty, tax, duties, etc..., from this project directly and indirectly.

- ❖ From above details, the quarry operations will have highly beneficial positive impact in the area.

#### 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, Spirometry 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 (1SW & 1 GW)   | -              | Once in 6 months             | Parameters specified under IS:10500, 1993 & CPCB Norms                  |
| 4 | Hydrology                | Water level in open wells in buffer zone around 1 km at specific wells   | -              | Once in 6 months             | Depth in m BGL  |
| 5 | Noise                    | 2 Locations (1 Core & 1 Buffer)  | Hourly – 1 Day | Once in 6 months             | Leq, Lmax, Lmin, Leq Day & Leq Night                                    |
| 6 | Soil                     | 2 Locations (1 Core & 1 Buffer)  | -              | Once in six months           | Physical and chemical characteristics                                   |
| 7 | 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/-              |
| 8            | Greenbelt              | -            | Rs 10,000/-              |
| <b>Total</b> |                        | <b>-</b>     | <b>Rs 1,45,000 /-</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.
- 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 14 local people.
- The proposed projects will plant about 2296 saplings in and around the lease area.

## 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.

| S. No. | Activity  | Responsibility |
|--------|---|----------------|
| 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 5 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 Kondalangkuppam Village. CSR budget is allocated as 2.5% of the profit.
- ❖ Rs. 5,00,000 will be allocated for CER.

**Table 8.1 CER Action Plan**

| S. No. | Activity  | Budget (Rs.in Lakh) |
|--------|---|---------------------|
| 1      | The applicant Indents to involve in corporate environment responsibilities (CER) activities such as renovation of existing toilet, plantation within the school premises, donating environment related books to the nearby school library, etc. | Rs.5,00,000         |
|        | <b>Total</b>  | <b>Rs. 5,00,000</b> |

*Source: Field survey conducted by FAE in consultation with project proponent*

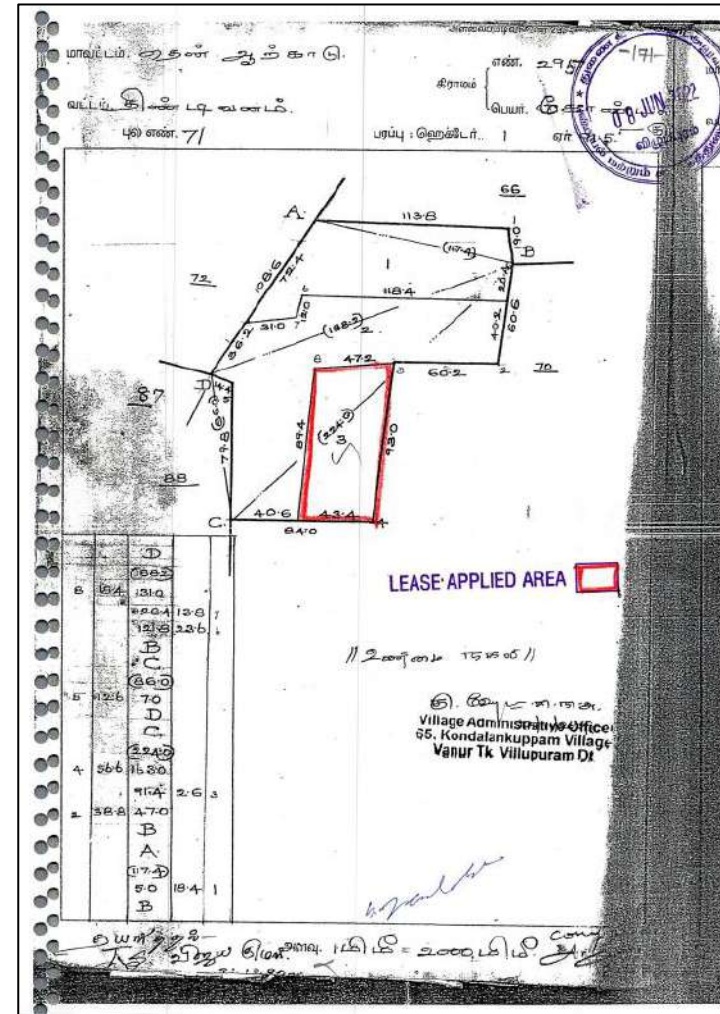
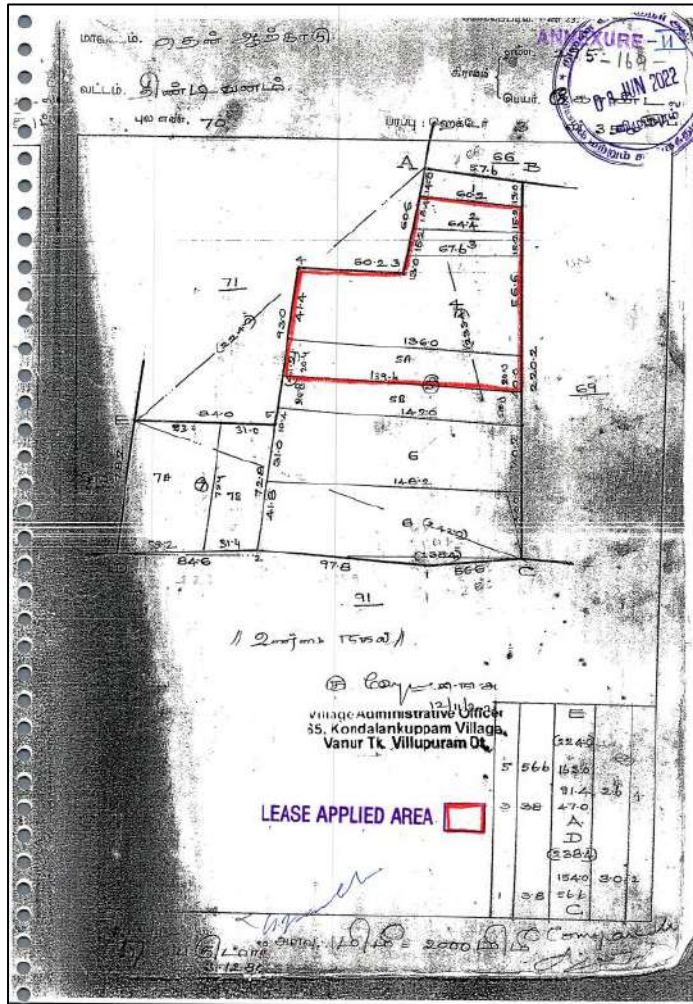
## CHAPTER X

### ENVIRONMENT MANAGEMENT PLAN

In order to implement the environmental protection measures, an amount of **Rs. 1654913** as capital cost and recurring cost as **Rs. 1077340** 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 2 years will be **Rs. 7660087**

# LAND DOCUMENTS

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



An FMP sketch showing proposed lease area in red colour

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31 JUN 2022

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31 JUN 2022

12. 295. காவல் பட்டியல்.

| 1  | 2 | 3            | 4 | 5 | 6   | 7   | 8 | 9 | 10 |             |   |
|----|---|--------------|---|---|-----|-----|---|---|----|-------------|---|
| 66 | 2 | 66-2         | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 3 44-0 6 88 | 203 கர. குடியேற்றம்.  |
|    |   |              |   |   |     |     |   |   |    | 3 76-0 7 52 |   |
| 67 | 1 | 67-2a<br>-2b | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 88-0 1 76 | 178 ர. சார்பு<br>பாதி க.க.உ.ப.  |
|    | 2 | -1           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 1 62-0 3 24 | 203 கர. குடியேற்றம்.  |
|    | 3 | -3a          | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 10-0 0 20 | 234 த. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 4 | 3-9          | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 11-0 0 22 | 203 கர. குடியேற்றம்.  |
|    | 5 | -4           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 68-0 1 36 | 83 கர. குடியேற்றம்.<br>க.க.உ.ப.   |
|    |   |              |   |   |     |     |   |   |    | 3 39-0 6 78 |   |
| 68 | 1 | 68-3         | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 43-0 0 86 | 246 கர. குடியேற்றம்.  |
|    | 2 | -4           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 16-0 0 32 | 228 த. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 3 | -5a<br>-5b   | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 50-0 1 00 | 235 க. குடியேற்றம்.   |
|    | 4 | -1           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 80-0 1 60 | 123 க. குடியேற்றம்.   |
|    | 5 | -2a<br>-2b   | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 57-5 1 15 | 132 க. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 6 | 68-7         | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 58-0 1 16 | 199 த. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 7 | -6           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 62-0 1 24 | 213 த. குடியேற்றம்<br>க.க.உ.ப.  |
|    |   |              |   |   |     |     |   |   |    | 3 66-5 7 33 |   |
| 69 | 1 | 69-1         | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 1 00-0 2 00 | 84 கர. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 2 | -2           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 95-0 1 90 | 11 த. குடியேற்றம்<br>க.க.உ.ப.   |
|    | 3 | -3           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 1 82-0 3 64 | 144 த. குடியேற்றம்<br>க.க.உ.ப.  |
|    |   |              |   |   |     |     |   |   |    | 3 77-0 7 54 |   |
| 70 | 1 | 70-5         | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 09-0 0 18 | 84 கர. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 2 | -6           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 41-0 0 22 | Village Administration Office<br>55, Kondalankuppam Village<br>Vanur Tk, Villupuram Cd. |
|    | 3 | -7           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 40-0 0 20 | 84 கர. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 4 | -8           | ர | 4 | ... | 8-5 | 8 | 2 | 00 | 0 64-0 1 28 | 132 க. குடியேற்றம்<br>க.க.உ.ப.  |

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annexure -177-  
31 JUN 2022

295. காவல் பட்டியல்.

| 1  | 2 | 3                           | 4 | 5 | 6   | 7   | 8   | 9   | 10  | 11          |   |
|----|---|-----------------------------|---|---|-----|-----|-----|-----|-----|-------------|---|
| 70 | 5 | 70-2a<br>2b, 2c             | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 59-0 1 18 | 156 த. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 6 | 70-3                        | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 55-0 1 10 | 68 த. குடியேற்றம்<br>(1) த. குடியேற்றம்<br>க.க.உ.ப. (2)                                 |
|    | 7 | -1a<br>1b, 1c<br>-1d<br>-1e | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 62-0 1 24 | 33 கர. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 8 | 70-4                        | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 65-0 1 30 | 229 த. குடியேற்றம்.   |
|    |   |                             |   |   |     |     |     |     |     | 3 35-0 6 70 |   |
|    | 1 | 71-1                        | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 60-0 1 20 | 157 த. குடியேற்றம்.   |
|    | 2 | -2                          | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 93-5 1 87 | 146 த. குடியேற்றம்.   |
|    | 3 | -3                          | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 38-0 0 76 | 157 த. குடியேற்றம்.   |
|    |   |                             |   |   |     |     |     |     |     | 1 91-5 3 83 |   |
|    |   |                             |   |   |     |     |     |     |     | 0 24-0 ...  |   |
| 71 |   | 72                          | ர | 4 | ... | ... | ... | ... | ... | ...         | க.க.உ.ப.<br>க.க.உ.ப.  |
| 72 | 1 | 72-1a                       | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 58-0 1 16 | 164 கர. குடியேற்றம்<br>க.க.உ.ப.   |
|    | 2 | -1b                         | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 90-0 1 80 | 118 த. குடியேற்றம்<br>க.க.உ.ப.  |
|    | 3 | 72-2                        | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 2 61-0 5 22 | 23 த. குடியேற்றம்<br>க.க.உ.ப.   |
|    |   |                             |   |   |     |     |     |     |     | 4 09-0 8 18 |   |
| 73 | 1 | 85-1                        | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 13-5 0 27 | 213 த. குடியேற்றம்.   |
|    | 2 | -2                          | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 51-0 1 02 | 215 க. குடியேற்றம்<br>க.க.உ.ப.  |
|    |   |                             |   |   |     |     |     |     |     | 0 64-5 1 29 |   |
| 74 |   | 74                          | ர | 4 | ... | ... | ... | ... | ... | 12 32-0 ... | Village Administration Office<br>55, Kondalankuppam Village<br>Vanur Tk, Villupuram Cd. |
| 75 |   | 75-1<br>2, 3                | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 2 37-0 4 74 | 146 த. குடியேற்றம்<br>க.க.உ.ப.  |
| 76 |   | 76-1                        | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 1 01-0 2 02 | 164 கர. குடியேற்றம்<br>க.க.உ.ப.   |
| 77 |   | 77-1                        | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 1 88-0 3 76 | 101 த. குடியேற்றம்<br>க.க.உ.ப.  |
| 78 | 1 | -2                          | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 52-0 1 04 | 51 த. குடியேற்றம் (1),<br>த. குடியேற்றம் (2).   |
|    | 2 | -3a                         | ர | 4 | ... | 8-5 | 8   | 2   | 00  | 0 52-0 1 04 |   |

A Register Documents





தமிழக அரசு

வருவாய்த் துறை

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

மாவட்டம் : விழுப்புரம்

வட்டம் : வாலூர்

வருவாய் கிராமம் : கொண்டாவங்குப்பம்

பட்டா எண் : 462

உரிமையாளர்கள் பெயர்

1. மாமலன்

சந்தை

பூபலன்

| புல எண் | உட்பிரிவு | முன்செய்               |                   | நன்செய்                |                   | மற்றுவை                |                   | குறிப்புகள்                                 |
|---------|-----------|------------------------|-------------------|------------------------|-------------------|------------------------|-------------------|---|
|         |           | பரப்பு<br>ஹெக்டே - ஏர் | தீர்வை<br>ரூ - பை | பரப்பு<br>ஹெக்டே - ஏர் | தீர்வை<br>ரூ - பை | பரப்பு<br>ஹெக்டே - ஏர் | தீர்வை<br>ரூ - பை |   |
| 70      | 3         | 0 - 10.00              | 0.20              | --                     | --                | --                     | --                | 2019/0103<br>/07/185933---<br>-- 16-08-2019 |
| 70      | 4         | 0 - 64.00              | 1.28              | --                     | --                | --                     | --                | 2019/0103<br>/07/157214---<br>-- 24-04-2019 |
| 70      | 5A        | 0 - 30.50              | 0.60              | --                     | --                | --                     | --                | 2019/0103<br>/07/185935---<br>-- 16-08-2019 |
| 71      | 3         | 0 - 38.00              | 0.76              | --                     | --                | --                     | --                | 2019/0103<br>/07/157214---<br>-- 24-04-2019 |
| 70      | 2         | 0 - 11.00              | 0.22              | --                     | --                | --                     | --                | 2019/0103<br>/07/185933---<br>-- 16-08-2019 |
|         |           | 1 - 53.50              | 3.06              |                        |                   |                        |                   |   |

குறிப்பு 2 :



1. மேற்கண்ட தகவல் / சான்றிதழ் தகவல் விவரங்கள் யின் பதிவேட்டிலிருந்து பெறப்பட்டவை. இவற்றை தங்கள் <https://eservices.tn.gov.in> என்ற இணைய தளத்தில் 07/02/065/00462/50542 என்ற குறிப்பு எண்ணை உள்ளிடு செய்து கொள்ளவும்.
2. இத் தகவல்கள் 21-09-2021 அன்று 11:28:39 AM நேரத்தில் அச்சிடப்பட்டது.
3. எனப்படும் கோரலின் 2D barcode படிப்பான் மூலம் படித்து 3G/GPRS வழி இணையதளத்தில் சரிபார்க்கவும்.

*(Handwritten signature)*

சீரமைப்பு கணக்கு - 181 -  
 கிராம நிர்வாக அலுவலகம், கண்டலங்குப்பம், வனூர் தக. வில்லுபுரம்.  
 கிராம நிர்வாக அலுவலர்

| பொது நிர்வாக அலுவலகம் |            |             |             |             | சம்பந்தம்        | சீரமைப்பு கணக்கு |                  |                  |                  |                  |                  |                  |
|-----------------------|------------|-------------|-------------|-------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| பி. அ. எண்.           | அ. அ. எண். | பி. அ. எண். | பி. அ. எண். | பி. அ. எண். |                  | சீரமைப்பு கணக்கு | சீரமைப்பு கணக்கு | சீரமைப்பு கணக்கு | சீரமைப்பு கணக்கு | சீரமைப்பு கணக்கு | சீரமைப்பு கணக்கு | சீரமைப்பு கணக்கு |
| 70                    | 3          | 0.10        | 0.20        | 462         | சீரமைப்பு கணக்கு |                  |                  |                  |                  |                  |                  |                  |
|                       | 4          | 0.64        | 1.28        |             |                  |                  |                  |                  |                  |                  |                  |                  |
|                       | 5A         | 0.30        | 0.60        |             |                  |                  |                  |                  |                  |                  |                  |                  |
| 71                    | 2          | 0.20        | 0.40        |             |                  |                  |                  |                  |                  |                  |                  |                  |
| 70                    | 2          | 0.11        | 0.22        |             |                  |                  |                  |                  |                  |                  |                  |                  |

சீரமைப்பு கணக்கு  
 Village Administrative Officer  
 66, Kondalankuppam Village,  
 Vanur Tk. Villupuram Dt

380/25-R.F. 111-A-10-50,00,000 Cps.-GBP.-MOU.-7.-2017.